E C O N O M I C S B U L L E T I N

International migration and human capital formation

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Abstract

We consider a model of international migration with heterogeneity in the skill level of workers which accounts for country−specific educational investment, unemployment expectations and return to the origin country. We prove that migrants invest less than natives in human capital formation because of return migration, so that migrants are more likely to be unemployed and to have flatter earnings profiles.

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1 Introduction

Several studies have attempted to identify the effect of immigration on labor market outcomes (see Borjas *et alii*, 1997, Gang and Rivera-Batiz, 1994). In the context of multi-factor production functions in which migrants and natives are separately incorporated, the impact of immigration on labor markets is shown to depend on the composition of skills between migrants and natives. In particular, immigration is expected to have an adverse effect on low-skilled natives when migrants are less skilled than natives. However, from an empirical viewpoint, Borjas (1994) and Friedberg and Hunt (1995) fail to conclude that there are large negative effects of immigration on both wages and employment of the native population.

It is now well acknowledged that economic performance of migrants is better than that of natives with similar characteristics (Stark, 1991). On the one hand, there exists a self-selection of migrants, who are more educated and less risk averse than other segments of the population of the origin country. On the other hand, migrants and natives face different incentives since there exists a positive probability of return migration to the origin country (Djajić, 1989). Galor and Stark (1990) examine the link between return decision and optimal choices of savings, and prove that migrants are expected to save more than natives. In Galor and Stark (1991), the possibility of return migration leads to an intertemporal substitution in the labor supply. In both cases, migrants are expected to outperform comparable natives[1].

Unfortunately, these previous papers do not account for human capital formation. As shown in Chiswick and Miller (1995, 1996), immigrants who intend to leave are less likely to invest in human capital, measured by the learning of the host country language. So, this makes them more difficult to employ and they are consequently characterized by lower pay and higher unemployment, but those who intend to stay do better[2]. In this paper, we provide a simple theoretical model to explain this phenomenon. For that purpose, we account for human capital formation in the model of international migration developed in Galor and Stark (1990, 1991). This allows us to offer a human capital explanation of migrants-natives differences in labor market outcomes, which depend on future earnings, expectations with respect to unemployment and human capital investment.

[1] Models of migration incorporating possible return behavior can be extended in several directions. For instance, Schaeffer (1995) notes that migrants have a higher incentive to maintain strong ties to the origin country when the probability of return is high. Hence, assimilation is more difficult to achieve if migrants have an uncertain status in the receipt country.

[2] Migrants who intend to stay in the host country choose to invest in host-country human capital formation, which improves their wage profile (Chiswick and Miller, 1994, Khan, 1997).

Human capital heterogeneity is one force that operates against the two other forces presented in Galor and Stark (1990, 1991), namely higher work effort and higher savings. The remainder of this note is organized as follows. In section 2, we present a two-period model of migration which accounts for country specific educational investment, unemployment expectations, and return migration. The optimal level of human capital investment is characterized in sections 3 and 4, where we respectively examine the impact of exogenous and endogenous employment. Concluding comments are in section 5.

2 A migration model with heterogeneous skill

We consider a migration model with two types of agents, migrants and natives. Migrants come from a poor country and natives live in a rich country, so that job opportunities are more attractive in the host country. We incorporate the consideration of country-specific skills in the framework developed in Galor and Stark (1990, 1991). Agents operate in a two-period setting. Each individual is characterized by a utility function U, defined over the first and second-period consumptions denoted by C_1 and C_2. We use a separable utility function $U(C_1, C_2) = u(C_1) + \delta u(C_2)$, δ being the future discount rate[3].

In period 1, individuals offer one unit of labor inelastically. Let W_1 be the level of income for that period, which is devoted to the first-period consumption C_1 and educational investment H. Human capital formation is costly for migrants, and we denote by $f(H)$ the associated convex cost function ($f'(H) > 0$, $f''(H) > 0$). Hence, the first-period constraint is $C_1 = W_1 - f(H)$. The migrant's occupational status is uncertain in period 2, so that the second-period consumption $\tilde{C}_2$ is a random variable. It depends on whether the migrant has a paid job in period 2 and on the probability of return to the origin country, denoted by ζ[4].

With probability $1-\zeta$, the migrant is in the host country in period 2. Then, there are two cases. On the one hand, the migrant may have a paid job. By securing employment, the migrant's income is defined as the sum of a fixed wage W_2, which may be seen as the minimum wage for low-skilled workers in the host country, and returns of human capital. The benefits of educational investment are given by the function $g(H)$, characterized by

[3] We assume that U is continuous, twice differentiable and strictly concave ($u' > 0$, $u'' < 0$). With respect to Galor and Stark (1991), leisure decisions do not matter in our framework.

[4] Our analysis does not focus on the motives for return migration, which may be due to i) country specific preferences, migrants having a preference for living and consuming in the home country, ii) price differentials, since migration return allows taking advantage of low price levels at home, iii) human capital investments, migrants improving their earnings position at home later by being currently in the foreign country, and iv) informational asymmetry, low-skilled migrants returning to the origin country after true skill is revealed in the rich country.

decreasing returns ($g'(H) > 0$, $g''(H) < 0$). On the other hand, the migrant may be unemployed in period 2. In that case, he receives a fixed unemployment compensation B since human capital investment is made only in period 1. Having more education decreases the probability of remaining unemployed in period 2. We denote by $p(H)$ the probability of unemployment, with $p'(H) < 0$ and $p''(H) < 0$.

With probability ζ, the migrant is expected to return to the origin country. We assume that the migrant finds a job with certainty in the origin country, for instance by undertaking family productive activities. Clear, the level of income received by the migrant is lower in the origin country than in the host country. This income may be expressed as λW_2, with $0 < \lambda < 1$. The parameter λ is simply a measure of the wage differential between the origin and the host countries. Given the probabilities of return migration ζ and unemployment $p(H)$, we get the following expression for the migrant's random consumption in period 2 :

$$\tilde{C_2} = \begin{cases} W_2 + g(H) & \text{with probability} \quad (1-\zeta)(1-p(H)) \\ B & \text{with probability} \quad (1-\zeta)p(H) \\ \lambda W_2 & \text{with probability} \quad \zeta \end{cases} \tag{1}$$

with $\lambda W_2 < B < W_2 + g(H)$, meaning that migrants always do better in the host than in their home country (even those who end up unemployed). Otherwise, they would not have migrated.

We are now able to determine the optimal choice of human capital for the migrant. For simplicity, we suppose that the migrant receives the minimum wage in period 1, which implies that $W_1 = W_2 = W$. The migrant seeks to maximize $U(C_1, \tilde{C_2})$:

$$\max_{H \geq 0} u(W - f(H)) + \delta \left[(1-\zeta)(1-p(H))u(W + g(H)) + (1-\zeta)p(H)u(B) + \zeta u(\lambda W) \right]$$

Then, we deduce the optimal level of investment in human capital H^* :

$$\begin{gathered} f'(H^*)u'(W - f(H^*)) = \\ \delta(1-\zeta)\left[p'(H^*)(u(B) - u(W + g(H^*))) + (1 - p(H^*))g'(H^*)u'(W + g(H^*)) \right] \end{gathered} \tag{2}$$

At the equilibrium, the marginal cost of human capital formation is equal to its marginal benefit given the probabilities of unemployment and return migration. We now turn to the impact of return behavior and unemployment expectations on the educational investment.

3 Human capital and exogenous unemployment

We first suppose that the probability of unemployment does not depend on the migrant's human capital formation. Such a situation is more likely when one considers a specific

segment of the labor market (for instance, both migrants and natives only take part in low-skilled activities). This implies that $p(H) = p$. From (2), we get :

$$f'(H^*)u'(W - f(H^*)) = \delta(1-\zeta)(1-p)g'(H^*)u'(W + g(H^*)) \tag{3}$$

So, the marginal gain for the migrant is given by the positive returns of human capital formation, at least when the migrant has a paid job in the host country.

Proposition 1 *The migrant's optimal investment in human capital decreases with the probabilities of unemployment and of return migration.*

Proof. From (3) such that $EU_{H^*} = 0$ and using the implicit function theorem, we have $\partial H^*/\partial p = -EU_{H^*p}/EU_{H^*H^*}$ and $\partial H^*/\partial \zeta = -EU_{H^*\zeta}/EU_{H^*H^*}$. Thus, we have $\operatorname{sgn} dH^*/dp = \operatorname{sgn} EU_{H^*p}$ and $\operatorname{sgn} dH^*/d\zeta = \operatorname{sgn} EU_{H^*\zeta}$, and we finally obtain :

$$\operatorname{sgn} \frac{\partial H^*}{\partial p} = \operatorname{sgn} \; -\delta(1-\zeta)g'(H^*)u'(W + g(H^*))$$

$$\operatorname{sgn} \frac{\partial H^*}{\partial \zeta} = \operatorname{sgn} \; -\delta(1-p)g'(H^*)u'(W + g(H^*))$$

Since we have $g' > 0$, $u' > 0$, $0 < \delta < 1$ and $0 < p < 1$, we deduce that $\partial H^*/\partial p < 0$ and $\partial H^*/\partial \zeta < 0$. QED

Corollary 1 *Migrants are less qualified than natives.*

Corollary 2 *If migrants do not return to their origin country, their wages will be lower than that of natives.*

In this migration model with skill heterogeneity, we point out the role of individual incentives in explaining the relative migrant's outcome. A migrant from a low-income country is less likely to invest in human capital formation given the possibility of return to the origin country, which implies a lower expected wage. So, if migrants do not return, their wages should be lower than that of natives. Thus, we show that return migration affects the distribution of observable characteristics among migrants, so that on average migrants' wages will be lower across different skill groups.

4 Human capital and endogenous unemployment

We now suppose that unemployment is endogenously determined, meaning that decisions of human capital investment are expected to influence the probability to find a job in the host country.

Proposition 2 *The migrant's optimal investment in human capital decreases with the return probability to the origin country when unemployment is endogenous.*

Proof. Using the implicit function theorem, we get $\operatorname{sgn} \partial H^*/\partial\zeta = \operatorname{sgn} EU_{H^*\zeta}$, so that :

$$\operatorname{sgn} \frac{\partial H^*}{\partial \zeta} = \operatorname{sgn} -\delta\left[p'(H^*)(u(B) - u(W + g(H^*))) + (1 - p(H^*))g'(H^*)u'(W + g(H^*))\right]$$

Since $0 < \delta < 1$, $0 < \zeta < 1$, $u(W + g(H^*)) > u(B)$, $p'(.) < 0$ and $g'(.) > 0$, we arrive at the result that $\partial H^*/\partial\zeta < 0$. QED

Again, we find that migrants are expected to achieve lower outcomes than natives when return migration does not occur, since migrants have less incentive to invest in human capital formation. So, given the possibility of country-specific education, migrants are more likely to have flatter earnings profiles.

Corollary 3 *Migrants display a higher rate of unemployment than natives.*

This migration model which accounts for skill heterogeneity explains why migrants are more likely to be unemployed in the host country. Since they do not invest enough in human capital formation during the first period given the possibility of return migration, it is more difficult for them to secure employment in the second period when they do not return to the origin country.

5 Conclusion

In this paper, we have analyzed predictions of a two-period model of migration with return behavior and skill heterogeneity. Since migrants face a positive probability of return migration, they are likely to invest less in human capital that is specific for the host country. Thus, on average, their wages will be lower.

Albeit different, our theoretical conclusion is perfectly consistent with the results of Galor and Stark (1990, 1991), who prove that migrants do better than natives when the

two populations have identical observable characteristics. We show that migrants who intend to leave invest less in human capital, so that they have lower pay and higher unemployment. Thus, on average, migrants have lower wages across different skill groups, but within a given skill group, the results of Galor and Stark still hold (those who intend to stay do better).

This impact of skill heterogeneity is clearly relevant with respect to decisions towards post-migration educational investment (Chiswick and Miller, 1994, Khan, 1997, Friedberg, 2000). Human capital formation is more likely among immigrants groups that cannot easily or are unlikely to return home. For instance, Hansen et alii (2001) show that refugee immigrants, characterized by a lower probability to return to the home country, invest more in specific-country human capital. This fact is consistent with our framework, according to which migrants facing higher expectations of return migration should invest less in education specific for the host country.

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