Return migration, human capital accumulation and the brain drain

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A B S T R A C T

In this paper we present a model that explains migrations as decisions that respond to where human capital can be acquired more efficiently, and where the return to human capital is highest. The basic framework is a dynamic Roy model in which a worker possesses two distinct skills that can be augmented by learning by doing. There are different implicit prices, in different countries and different rates of skill accumulation. Our analysis contributes to the literature on the selection of immigrants and return migrants by offering a richer framework that may help to accommodate selection of emigrants and return migrants that are not immediately compatible with the one-dimensional skill model. Our analysis also has implications for the debate on brain drain and brain gain. In the two skills model presented here, return migration can lead to a mitigation of the brain drain, or even the creation of a “brain gain”, where those who return bring the home country augmented local skills.

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1. Introduction

Mobility of workers across national borders responds not only to the return to skills, but also to the opportunity and efficiency of skill acquisition. Efficiency considerations suggest that skills should be acquired where the cost is low and applied where the reward is high. This last aspect has been largely overlooked in the literature that analyzes the causes and forms of migration. Thus, individuals may choose to acquire skills abroad that are highly rewarded in their home country and produced cheaply elsewhere. Student migrations are an example with some countries having established themselves as learning centers that provide educational services above those demanded domestically.2

There is evidence that, for migrants who returned to their home country, work experience acquired abroad enhances earnings by more than work experience acquired in the home country. Reinhold and Thom (2009) analyze earnings of Mexican emigrants who returned from the U.S. They find that, for these immigrants, the labor market experience accumulated in the US increases earnings by twice the amount than

experience accumulated in Mexico. Papers by Barrett and O’Connell (2001), Barrett and Goggin (2010) and Iara (2006) report similar findings for Ireland and for migrants who returned to Eastern Europe from Western European countries. Co et al. (2000) report a wage premium for having been abroad for female return migrants to Hungary.3

In this paper, we present a model that explains migrations as decisions that respond to where human capital can be acquired more efficiently and where the return to human capital is highest. The basic framework is one in which a worker possesses two distinct skills that can be augmented by learning by doing while acquiring work experience. The two skills command a different implicit price in different countries. The rate of human capital accumulation is also different in different countries. Thus, a person may move to a country where her skills grow fast and then apply these skills in a different country where these skills have a high price. In this regard, there is an

3 Return migration is an important phenomenon. Of the foreign born population that entered the UK in the 1990s, and stayed for at least one year, about 40% had left the UK after another 5 years (see Dustmann and Weiss, 2007). Bijwaard (2008) reports that of those arriving to the Netherlands, about 40% have left the country within seven years. Christophe and Spielvogel (2008) report similar out-migration rates for other countries. The average out-migration rate after 5 years ranges from 28% for the Netherlands to 60% for Ireland. Of those immigrants from Mexico who resided in the US in 1995, 3.7% had returned in 2000. Return rates differ across education groups: While only 1.6% of those with an intermediate level of education had returned, 4.3% and 5% of the low and highly educated returned. Similar U-shaped patterns for return apply to migration from the US to Argentina and Brazil and from Spain to Chile, Brazil, Argentina and Mexico.
important difference between human and physical or financial assets. Human capital cannot be separated from its owner and he/she must move in order to exploit differences in returns in different locations.

An early paper that discusses higher return in the home country to skills acquired in the host country as a motive that triggers return migration is Dustmann (1994, 1995). Other papers that analyze this motive are Borjas and Bratsberg (1996), Santos and Postel-Vinay (2003), De Coulon and Piracha (2005), and Mayr and Peri (2008). These models assume that individual skills are one-dimensional. In the single skill model, individuals move based on the prices of this skill in the two countries. If the price is higher in the receiving country some highly skilled workers will move. If the possibility to learn abroad is added, some of those who moved will return but those will be the least skilled among the emigrants. Conversely, if the price of the single skill is lower abroad, low skilled workers will emigrate and among these immigrants the most skilled will return.4

Considering two skills and allowing comparative advantage to play a role, we obtain “non-hierarchical” migration and remigration patterns with movements that are neither positively nor negatively selected. Among the stayers in the home country, there are some who are more able (in the sense of having a larger endowment of both skills) than some of the movers. At the same time, there may be some movers who are more skilled than some of the stayers. In both comparisons, those who stay have a relatively high component of the skill that is more highly valued in the home country and those who move have a relatively high component of the skill that is more highly valued in the host country. By the same logic, the selection of return migrants may exacerbate or alleviate the impact of migrant selection for the initial out-migration for both emigration- and immigration country. In these regards, the multi-dimensional skill distribution yields a richer set of testable implications than the one skill model of Borjas and Bratsberg (1996).

Our model has important implications for the debate on brain drain and brain gain. In an early paper, Kwok and Leland (1982) describe brain drain as a (permanent) outflow of skilled workers. The model discussed by Borjas and Bratsberg (1996) adds an additional dimension to this: A brain drain issue arises when the price of skills is higher abroad, and may be amplified by those who return being the less able among those who left. In the two skills model presented here, the brain drain is mitigated because those who return come with augmented local skills that are more applicable in the home country. If the proportion of those who return is large enough, aggregate output and even output per capita may increase, implying a brain gain. We then discuss who shall return to the home country and from which countries, the receiving country and the country of origin, denoted by \( s \) and \( a \), respectively, and two skills, denoted by \( 1 \) and \( 2 \). Each person is characterized by a bundle of two latent skills and in each country there is some bivariate distribution of these skills in the population.9

For any fixed price of skills, one can use a linear transformation to translate the latent skills \( S_1 \) and \( S_2 \) that a worker possesses to the potential productivity capacities of the worker in each of the two countries, \( \ln K_a \) and \( \ln K_b \). We can thus describe a worker by the pair \((K_a(t), K_b(t))\) instead of a pair of latent skills \((S_1(t), S_2(t))\).10

Skills are initially endowed and can then be augmented by acquiring work experience. We consider here a “learning by doing” technology, whereby work in country \( j \) augments skill \( s \) at a constant rate \( \gamma_{sj} \) per unit of time worked. Note the joint production feature of this technology; working in any one country \( j \) augments two skills that...
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