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## macroeconomía del desarrollo

# **T**he international mobility of talent and its impact on global development: an overview

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## Abstract

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Human talent is a key economic resource and a source of creative power in science, technology, business, arts and culture and other activities. Talent has a large economic value and its mobility has increased with globalization, the spread of new information technologies and lower transportation costs. Well educated and/or talented people are often more internationally mobile than unskilled workers. Immigrants with high human capital face more favorable immigration policies in receiving countries, typically high per capita income economies short of information technology experts, scientists, medical doctors and other types of talent. The purpose of this paper is to review analytical and policy issues related to the international mobility of talented individuals, examining the main types of talent who move internationally, their specific traits and characteristics and the implications of this mobility for source and destination countries and for global development.



## I. Introduction

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Human talent is a key economic resource and a source of creative power in science, technology, business, arts and culture and other activities. Talent has a large economic value and its mobility has increased with globalization, the spread of new information technologies and lower transportation costs. Well educated and/or talented people are often more internationally mobile than unskilled workers and face more favourable immigration policies in receiving countries, typically high per capita income economies short of information technology experts, scientists, medical doctors and other type of talent.

Individuals from developing countries are increasingly meeting the global demand for talent. This is the case of medical doctors from the Caribbean, Sub-Saharan African countries or the Philippines, information technology experts from India, Taiwan and China, engineers and mathematicians from the former Soviet Union, indigenous singers from Africa, professionals and writers from Latin America and others.

The economic value of talent stems from its various uses. Talent can be a productive resource for current production (e.g. information technology experts and engineers), or a source of wealth creation (entrepreneurs), a source of knowledge (scientists), provide a social service (nurses, physicians) or cultural work (artists). The sociology of talent is interesting; talents constitute an international elite in the economic, financial, or cultural areas. These international elites can be in trans-national corporations, in the bureaucracy of international organizations, or in more independent locations. Talented individuals usually have considerable influence at national and international levels

as they are often well connected, shape ideas, values and beliefs. In turn, many of them are decision makers in the private sector or government.

The international mobility of talent can have important development effects on the source nations, on the receiving countries and on the global economy and society. In source countries, the emigration of talent can reduce their human capital base. Developing countries that see their entrepreneurs, scientists, technology experts, medical doctors emigrate can experience a retard in their development potential. In contrast, receiving countries will benefit from an inflow of talent that enlarges their qualified human resource base relieving shortages of high skills people. Depending on the type of human capital received, recipient countries can benefit in the science sector, in health and in culture. Return migration and the international circulation of ideas, technology, expertise can counter-balance, to some extent, a skewed distribution of gains from the mobility of talent toward receiving countries.

The purpose of this paper is to review several analytical and policy issues related to the international mobility of talented individuals, examining the main types of talent who move internationally, their specific traits and characteristics and the implications of this mobility for global development.

This overview is organized in 5 sections besides this introduction. Section 2 proposes a taxonomy of several categories of talent that are internationally mobile. Section 3 analyzes the main determinants of the international mobility of talent such as the rewards structure, interactions with peers, linguistic and cultural compatibility, education and political economy considerations. Section 4 discusses the development impact for source and destination countries of talent mobility; section 5 identifies elements of a policy-research agenda to foster the contribution of talent to global development. Section 6 concludes.

## II. Categories of talent

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This section offers a classification (taxonomy) of different types of talent according to occupational characteristics and work relation (e.g. self-employed and employee). Different types of talent can have a differentiated development contribution. Some contribute directly to wealth creation, others to technological advancement, and others to cultural activities. The classification goes as follows:

1. Technical talent
2. Scientists and academics
3. Professionals in the health sector: medical doctors and nurses
4. Entrepreneurs and managers
5. Mobility in international organizations
6. Cultural talent.

### 1. Technical talent (TT)

By “technical talent” we mean people who are experts in information technology (IT), telecommunications and computer science. These people often hold a university or advanced technical institute degree in mathematics, engineering, and computer science. They can be developers of new software and hardware in the information technology sector or be engaged in applications in industry, services, the banking sector, government, etc. These people are sometimes referred as “knowledge workers” or owners of

“intellectual capital” (see D’Costa, 2004; Drucker, 2000). They often face a favourable visa system in developed countries.<sup>1</sup> A main exporter of technical talent in the world economy is India, the country that accounts for the largest number of scientists and engineering degrees in the US and 30,000 S&E doctorates in 1999, (see D’Costa, 2004).<sup>2</sup> The mobility of technical talent depends on the way IT services are delivered. For example in the United States, IT services are delivered in two main forms: on-site services (which require the physical presence of the expert) and off-shore development (which may be delivered from the home country of the IT firm although some travelling of the expert may be involved as well). The diaspora of technical talent is often referred to as a “brain bank” whose “(human) capital” is formed by the stock of talent abroad. Countries with a large pool of technical talent abroad are India, China, Russia, Ukraine, Belarus, Hungary, Poland, and others.

## 2. Scientists and academics

Scientists and academics compose another brand of talent, related to technical talent. They may belong to physical sciences such as physics, math, and chemistry or social sciences such as anthropologists, sociologists, political scientists, economists, and the like. These people are internationally mobile when they have good qualifications, a publications record, international contacts, and so on. Scientists leave their home countries attracted by higher salaries abroad, by the possibility of increasing their knowledge base and to transmit their own, to interact with peers of international recognition, and pursue a successful career. This set of factors can be considered as “pulling factors”. In turn, “pushing factors” that induce scientists and academics to emigrate are: low salaries at home, limited professional recognition, poor career prospects, and the absence of a critical mass of peers in their home country. A vehicle through which future academics and scientists come to foreign countries is as graduate students to get a Masters degree, a PhD, or pursue a post-doctoral fellowship. Some of those students abroad return back home after graduating abroad while others remain in the host country to work in universities, research centres, and industry. Empirical evidence on foreign students studying and working after graduation in the United States, provided by the US National Science Foundation (NSF, 1998) and Regets (2001), seems to show a pattern that combines elements of “*brain circulation*” and “*brain drain*”.<sup>3</sup>

## 3. Professionals in the health sector: medical doctors and nurses

A specific form of talent outflow that is worrisome for developing countries—particularly for the poor ones—is the international mobility of professionals in the health sector, mainly medical doctors and nurses. Main importing countries of medical doctors and nurses are the United Kingdom, the United States, Australia, Canada, and other industrial nations. Important suppliers of health professionals from developing countries are the Philippines, India, several African and Caribbean countries. In 2002–03 the three main source-countries of overseas-trained nurses in the UK were the Philippines, India and South Africa (see Bach 2003). The demand for foreign professionals of the health sector seems to be associated with a supply shortage of native health

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<sup>1</sup> It is estimated that of the 331,206 HB1 visas approved in the US in 2001, 49 per cent went to Indians and 92 per cent to IT experts, see D’Costa (2004).

<sup>2</sup> It is estimated that half that number planned to stay in the US after graduation.

<sup>3</sup> A NSF (1998) study shows that about 47 per cent of the foreign student on temporary visas, who earned doctorates in 1990 and 1991, were working in the United States in 1995. In turn, the majority of the foreign doctoral recipients in 1990-91 coming from India (79 per cent) and China (88 per cent) were still working in the US in 1995. In contrast, only 11 per cent of South Koreans who completed science and engineering doctorates from US universities in 1990-91 were working in the US in 1995. The NSF study reports that foreign doctoral recipients in science and engineering that were working in the US after 10 or 20 years tended to remain in the country (no significant net return migration).

sector professionals. As the incidence of various diseases such as malaria and HIV-AIDS is much higher in developing countries, particularly in Sub-Saharan Africa countries, the paradox—from a social point of view—is that much needed medical personnel leave their home countries where they are in high (social) demand (the ability to pay for their services is another matter) looking for better salaries and enhanced possibilities of career development abroad. The flow of talent is not always from developing countries to industrial nations (or south-north). Some developing countries with a high supply of medical personnel (i.e. Cuba and China) tend to send medical doctors to other developing countries (south-south flows) suffering from health crises, natural disasters, and to help to set-up national health systems in which these professionals can make a valuable contribution. There is also a considerable movement of medical doctors and nurses within industrialized countries. For example, between 1990 and 2000, of the almost 7,000 Canadian physicians that left the country, mainly going to the United States, less than 3,000 returned home (Bach 2003).

Foreign health professionals are often subject to licensing requirements. These are often lengthy, complex and costly processes that, in practice, constitute an effective barrier to entry to the local labour market of foreign health professionals. At the same time, due to scarcity of health professionals in the industrial countries such as the US and the UK they have easier access to working visas than other professionals.

#### 4. Entrepreneurs and managers

An important feature of migration, relatively neglected in the discussion of talent mobility, is the international mobility of entrepreneurship. Entrepreneurs, in the Schumpeterian tradition, are agents of resource mobilization, investment, and innovation.<sup>4</sup> From an international perspective, entrepreneurs can transfer innovative and wealth creation capacities from one country to another. This is a scarce trait in developing (and probably developed countries also), so their permanent departure is likely to have a retarding effect on national development. However, if conditions are propitious and entrepreneurs do return home bringing along fresh capital, technologies and contacts developed abroad with an ensuing positive developmental effect. Thus, we can make a distinction between “entrepreneurial drain” and “entrepreneurial circulation”.

Historically, world-wide successful entrepreneurs and bankers in the late nineteenth and early twentieth century in the United States and Europe such as Mellon, Vanderbilt, Carnegie, Rockefeller, the famous banking dynasty of the Rothschild with operations in London, Zurich and other financial centres, were foreign-born or first descents of immigrants.<sup>5,6</sup>

There is considerable variation in the scale of the business activity created by the entrepreneurship of foreign migrants.<sup>7</sup> Not all entrepreneur immigrants operate at the economic scale of the Rockefellers, Rothschild, or Soros. There is, indeed, a plethora of them operating at the

<sup>4</sup> For an interesting discussion of the distinctive features of the entrepreneurs in theory and practice, see Baumol (1993). A classic article on the economic role of the entrepreneur is Schumpeter (1911 [1934]).

<sup>5</sup> See Ferguson (1999). In this case, it is interesting to note that the Mellons, Rockefellers, and others, besides accumulating a large wealth, had an interest in creating centres of education and learning. In fact, they helped to establish universities and created private foundations devoted to education purposes. Carnegie in particular, was one of the pioneers in the formation of the system of public libraries in the United States at the turn of the twentieth century. Later on, names such as George Soros, an immigrant from Central Europe escaping Nazi persecution in the 1930s, turned abroad into a very successful financier. Soros is another case of a talented entrepreneur with a philanthropic gist manifested in creation of the Soros Foundation and the network of Open Society Institutes throughout the world.

<sup>6</sup> Some studies have observed a connection between ethnic diasporas and entrepreneurship. Classic examples of this are the Jewish emigration to the United States. In fact, it is estimated that the contribution of the Jewish community in America to business creation and banking is far larger than their share in the total population of the US. In the context of developing countries, Chinese emigration has played an important role in building a business community (of Chinese origin) in several very dynamic economies of South-East Asia. In turn, immigration from Germany, Italy, Syria, Palestine, Lebanon to Argentina, Chile, and Brazil at the turn of the twentieth century, played a very important role in building the textile sector, banking, agriculture, and mining sectors in these Latin American countries.

<sup>7</sup> This section is based on Solimano (2004a).

level of family business and small firms. A typical example are the ethnic restaurants (e.g. Chinese, Indian, Brazilian, French, Italian, etc.) in the large cities of developed countries. Moreover in the carpet and furniture business in these cities there is a predominance of Turkish, Indian, Pakistani, and Moroccan owners. These patterns of immigrant entrepreneurship do not mobilize large amounts of financial resources but they can be quite labour intensive and their businesses add to the variety of services in host countries. The sociological profile of these endeavours is interesting: businesses are usually owned and run by members of a specific ethnic group and the employees (many times family members) tend to be also of the same ethnicity.<sup>8</sup> The connections between ethnicity, entrepreneurship and migration and their patterns of integration/exclusion with the local economy and society are themes that deserve further inquiry. For example some ethnic-migrants form entrepreneurial groups among themselves and may have more difficulty in integrating into local society than immigrants that develop entrepreneurial activities across a more diverse ethnic spectrum.

The relationship between endowments of human capital and entrepreneurship is also an interesting subject. Entrepreneurs are not necessarily people with a high stock of formal education; in addition, the “psychology of the entrepreneur” is certainly different from that of the scientist, the expert or the intellectual who we usually identify with “human capital”. Typically the entrepreneur is prone to risk-taking, has a talent for combining capital, labour and for entertaining a vision of opportunities and the prospects for profits (see Schumpeter 1911 [1934]). In contrast, professionals, scientists, and engineers are often employees rather than owners and are supposed to be more risk averse than self-employed entrepreneurs.

**Managers.** The international labour markets for talent can be grouped in two “circuits” (or sectors) that demand qualified human resources in the global economy: *the international private sector* and *the international public sector*. In the international private sector, multinational corporations and banks often transfer some of their key management abroad. The Chief Executive Officer (CEO) may be a staff member of the company brought from headquarters or, alternatively, he or she can be a national, hired locally. Some corporations or international banks transfer their general counsellor, the financial manager and sometimes their human resource managers. Certain corporate policies may be specific and companies may want to preserve their corporate culture in these matters. This is a clear point of further research. Transnational corporations and banks are another vehicle for the international transfer of talent within the international private sector.<sup>9</sup> International investments often require that managers move internationally to establish contacts in foreign markets, make business deals and set-up operations abroad. In addition, international investment projects may usually involve the movement, across countries, of engineers and skilled workers in the phase of project design, project implementation and actual operations. Some of these people may move only temporarily (for a few months) while others move on a more permanent basis (for several years).

## 5. Mobility in international organizations

Multilateral and regional development banks, various international organizations and development agencies at global, regional and national levels comprise the international public sector. International organizations are intended to promote international development through technical assistance, lending (in the case of development banks) and knowledge generation and dissemination. These institutions require qualified professionals such as economists, engineers,

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<sup>8</sup> See Ndoen et al. (2000) and Kloosterman and Rath (2001).

<sup>9</sup> See Vodusek (2001) for the case of international investment from Europe into Latin America.

social scientists, health experts, and environmental specialists (and others). Many of them come from developing countries. They often hold advanced degrees (Masters or PhDs) earned in first-rate universities mainly in the US, Canada, and Europe and work for international organizations whose headquarters are located in Washington, Paris, London, Geneva, and other major cities. International organizations are an attractive pole of attraction for professionals: they offer internationally competitive salaries and benefits; stable careers and their staff can get a first hand involvement with development problems from a privileged position. From the viewpoint of the direction of talent mobility, the international public sector (mostly located in the capitals of developed countries) encourages a flow of human capital to the developed countries. The counterpart of this is that these human resources are directed to work on problems of the developing countries (under the priorities established by the international organizations) and reduce the supply of professionals for government (and private sector) in the source country.

## 6. Cultural talent

Our discussion of the mobility of talent has referred mainly to talent linked to the production side of the economy or the social sector (i.e. health professionals). However, talent moves also in response to the demand for cultural activities, entertainment, and aesthetic enjoyment. Here we refer to a variety of “cultural workers”, such as musicians, singers, writers, painters, designers, and the like. Their motivation for migration and international circulation is probably similar to other types of talent. The expectation of better economic possibilities abroad than at home (i.e. higher earnings), access to a larger market, interaction with other producers of culture, and the lure of becoming better known internationally. Creative processes are rarely done in isolation and the interaction with other artists can enhance the quality of cultural work. At the same time, signalling and reputation are important elements behind the success of artists and their earnings profile. An opera singer of worldwide reputation may have better access to mass media in international circuits than an unknown singer of pop music operating at a local level. Well-known writers who operate at an international scale find easier the access to publishing. In turn, famous painters may have agents that commercialize their paintings. The cultural market, as we shall see in the next section, has features of “winner-takes-all” markets such as sport and music.



### III. Determinants of the international mobility of talent

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The literature on international migration, which often focuses on low skilled migrants, highlights various determinants of the direction and size of net migration flows such as real wages differentials among countries, network effects, costs of migrating, language barriers, business cycles in source and destination countries, and immigration policies in the host countries.<sup>10</sup> These determinants of international migration apply, in principle, to individuals of different skills although some factors (costs of migrating, language and cultural barriers, etc.) are probably less relevant for the mobility of talent with a high stock of human capital, knowledge of foreign languages and broader cultural backgrounds. Let us analyze the determinants of talent mobility in more detail.

#### 1. The rewards structure

The market rewards to talent is a key determinant of the allocation of talent both at national and international levels. If the earnings of lawyers are higher than the earnings of teachers we can expect that more talented people will study law than education as talent

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<sup>10</sup> Empirical migration equations usually include the ratio of net migration (immigration minus emigration) to population as the dependent variable and the following explanatory variables: the ratio between real wage (or real per capita income) in the home country relative to the wage in the destination country, a lagged migration variable capturing persistence effects and friends and relatives effects (social network considerations), a two-decades lagged demographic variable representing population growth and a variable denoting the degree of industrialization in the home country, see O'Rourke and Williamson (2000) and Borjas (2002). Other specifications for certain countries include political economy variables such as the type of political regime in the sending country and the respect for civil rights (Solimano, 2004b).

allocation at national level depends on the rewards of alternative occupations. In turn, the international mobility of talent depends on the expected income differential that can be earned abroad with respect to earnings at home in a given activity.<sup>11</sup> For example if the earnings (measured in the same currency at purchasing power parity) of engineers in country x, adjusted by the cost of living and the cost of moving, are higher than the earnings of engineers in country y, we can expect that engineers will migrate from country y to country x. The earnings may be a salary or other honorarium for professionals, technical experts, and medical personnel or profits for entrepreneurs, or honoraria, royalties, and international prizes for artists, writers, and painters.

International income differentials across countries may be substantial: it is reported that a Filipino nurses can earn between US\$ 75–200 per month in the Philippines compared to US\$ 3,000–4,000 in the United States (Bach 2003). In turn, the average annual net income of a US physician is reported to be US\$ 269,000 compared to US\$ 119,000 for Canadian physicians (in 1995–96, see Bach 2003) due mainly to differences in tax rates between the two countries. These large net income differentials certainly prompt emigration to the higher pay/lower tax country. Differential tax rates between countries also matter in determining net income differentials, as illustrated in the case of Canada and the U.S. Thus, we can expect that talent will move from countries with high income tax rates (e.g. Canada and the Nordic countries) to countries with lower income tax rates.

Failures of markets to properly reward talent can lead to resource misallocation. Among the reasons why market rewards can diverge from social values is the difficulty in identifying the output of talent; as a consequence, the rents associated with special abilities cannot be privately internalized.

The return of talent can be particularly difficult to assess in the fields of entrepreneurship and creative activity. The difficulties to reward entrepreneurial talent may be related to weak property rights, weak patent system for innovations, stiff taxation and corruption (see Acemoglu and Verdier 1998). Studying the effects of talent allocation on economic growth Murphy et al. (1991) show that in economies in which rent seeking is highly profitable (due to distortions, import protection, corruption and lobbies capturing key state-agencies) the return to wealth creation, innovation and entrepreneurship will be low compared to the return of devoting time and efforts to rent seeking. The result may be economic stagnation and poverty as the return to talent is distorted against productive endeavours. In turn, international differences in the relative returns between rent-seeking versus wealth-creation/entrepreneurial-oriented activities can be a cause for the emigration of entrepreneurs from high-rent seeking countries to lower-rent seeking countries where entrepreneurial talent is more valued.<sup>12</sup>

The empirical part of Murphy et al. (1991) uses the share of college enrolment in engineering in total college enrolment as proxy of talent allocated to productive activities and the share of enrolment in law as a share of total college enrolment a variable denoting talent allocated to unproductive, rent-seeking activities. This variable is then used as an additional explanatory variable in growth equations *à la* Barro in a panel including 91 countries (or 55 countries with more than 10,000 college students) in the period 1970-85. In the sample of all countries the authors find a positive and statistically significant effect of the share of college graduates in engineering in an initial year, and a negative but statistically insignificant effect on growth rates of the proportion

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<sup>11</sup> Expected income differentials have to be adjusted by the costs of migration (pecuniary and non-pecuniary).

<sup>12</sup> Acemoglu (1995) also makes the case that the valuation of entrepreneurship is affected by social norms, and societies recognition of wealth creating versus other activities. In some countries entrepreneurs have high social esteem, and in others low. This theme is also present in Max Weber's *Protestant Ethic and the Spirit of Capitalism* (1930 [2000]) in which countries that have a protestant ethic are supposed to be more prone to wealth-oriented systems due to a higher valuation of thrift, effort, and risk-taking activities, typical of the entrepreneurial spirit.

of college graduates in law. As the authors state: “the signs of the coefficients are consistent with the theory that rent seeking reduces growth while entrepreneurship and innovation raises it.”

Rewarding talent engaged in starting new activities and developing new products or techniques—the distinctive role of the entrepreneur according to Schumpeter—in which the demand is difficult to anticipate, presents several problems. History matters in the formation of expectations and therefore with new activities and products history literally does not exist. Thereby, talent needs to be compensated for this fundamental uncertainty. Both Frank Knight and Joseph Schumpeter underscored this point in their writings on the return on capital and entrepreneurship. For Schumpeter the entrepreneur is somebody who breaks the “status quo” and innovates and development is the shift between qualitatively different “circular flows” associated with a stream of new innovations led by the entrepreneur. This is different from the repetition of capital accumulation and growth under the same set of organizations and techniques (stationary equilibrium).<sup>13</sup>

This uncertainty on the value of talent is not only valid for the entrepreneur (a self-employed individual) but also for hired new talent (employees). In the case of employees there is also uncertainty on the market valuation of new products produced by hired talent. However, this is not the only source of uncertainty for the firm: it also has to ascertain the actual productivity, work effort and social integration at firm level of talented new employees. Here the contracts structure (including monitoring capabilities) matters a good deal, as underscored by the new contract theory (see Bolton and Dewatripont 2005).

Valuing talent is also difficult in the “creative industries”, (see Caves 2000) of painters, writers, singers, classic musicians, film-makers, designers and others. In the creative industry there is often uncertainty related to the ways markets will value new paintings, new books, new films and other products of creative people. This certainly has an impact on the behaviour of publishing houses, record companies, film studios, opera houses, etc. A variety of contract structures have been developed in the creative industries to deal with these uncertainties that attempt to share these risks between agents and principals (see Caves 2000).

Another feature of the economics of talent is the existence of *increasing returns to ability* in which small differences in individual abilities can generate large differences in pay and reward. This is the essence of the theory of “winner-takes-all markets” applied to arts, sports and other activities that involve talent. In fact, the number one tennis player in the world makes an income several times larger than the second or third player who can be nearly as talented as the number one who receives the main prize (and the most lucrative advertisement contracts). In this context, the possibility of making super-normal rents attracts talent to these activities. Authors such as Frank and Cook (1995) have argued that the lure of such rents attracts an *excessive* allocation of talent to these activities compared to what is socially optimal if true probabilities of making the big prize were known *ex ante*. In contrast, activities with diminishing returns may not attract the brightest people, as effort tends to be only weakly compensated at the margin. This is often the case of teachers, public employees, and medical doctors in public health systems. Also teamwork and joint production in which individual contributions are hard to detect tend to discourage really outstanding talent. Bureaucratic organization with flat remuneration structures may fail to attract talent. However, at international level the salary differentials between international organizations and national agencies may be very large, inducing the migration of talent to international organizations, particularly those run more on merit than on other considerations.

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<sup>13</sup> See Schumpeter (1911 [1934]). The super-normal profits associated with innovation have to compensate for this sort of risks.

## 2. Linguistic compatibility, networks and socio-cultural affinity

The standard characterization of immigrants—alien to the culture of industrial countries, without domain of the local language, essentially a socially marginalized individual—certainly does not square with the “talent super-elite” formed by CEOs of large multinational corporations, well-recognized scientists, international investors, and famous artists and writers. These people often have high education, knowledge of more than one language, understanding of cultural differences among countries, etc. These traits facilitate their international mobility and ease their adjustment to other countries and realities. The international elite of talent have often studied abroad, belong to professional and alumni networks of prestigious universities and have developed a dense net of contacts with well-placed individuals around the world that facilitate their mobility. However, there is a degree of social differentiation within the talent elite. Certainly, less flamboyant talent such as nurses, technical experts, and small-scale entrepreneurs from developing countries often do not share other traits of the super-elite.<sup>14</sup>

## 3. Shortage of skilled professionals in industrialized countries and visa policy

The shortage of certain skilled professionals such as information technology experts and computer science specialists, nurses, medical doctors is an important factor behind the increase in demand for talent in the world economy. The information revolution apparently has led to technical change that saves unskilled-labour, substituting it for skilled workers. Immigration policies are also much more favourable for international talent than for unskilled migrants and this is also an important facilitating process for talent mobility. Countries such as the US, UK, Germany, and others have special visa programs for IT experts, nurses and medical doctors, international scientist and graduate students. In the US, however, the environment after the events of 11 September 2001, has slowed down the visa processing process for foreign students and professionals. This trend has potentially adverse effects for the development of science in a country that relies quite heavily on foreign talent for that purpose.

## 4. Education and talent allocation

The literature of talent allocation stresses the importance of education in nurturing and developing talent. However, there is not consensus on the mechanism through which education affects the allocation and mobility of talent. The standard assumption is that investment in human capital and talent is positively correlated: talented individuals choose more reputable and better-paid careers. In other words, the highest return of investment in human capital goes to the most talented individuals. In addition, if education has a signalling effect (Spence 1974) talented individuals choose to be educated, preferably in good universities, to signal that they have high ability. The critical notion in the “education as signalling” approach is that information to the market is the key consideration in the choice of education by talented people. Authors such as Grossman (1999), Benabou and Tirole (2000), and Hvide (2001) have contested this assumption by considering that education plays also an important role in providing information to the individuals who are educated about their own abilities. Thus education helps individuals to gather private information about their capacities and potential performance in labour markets after completing

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<sup>14</sup> Observers have noted that certain traits have been important in making inroads for Indians in the US market in the high-tech sector. Indian experts and entrepreneurs are fluent in English, have connections with IT firms at home due to work experience in the US either as entrepreneurs or employees facilitating in-site and off-shores delivery of IT, an ability to work within the US labour and commercial and legal system (see Pandey et al. 2006).

their careers. In these papers employment contracts are endogenous and affect the allocation of talent. Interestingly, Hvide (2001) arrives to the following result: in the context of education as a learning process in which information capital is accumulated, the most able individuals, who have a high level of self-confidence, will skip (higher) education and go directly to the market often as entrepreneurs. As they have a high degree of self-confidence they avoid the potentially large opportunity cost of spending several years pursuing a career. They prefer to accumulate wealth (undertaking profitable projects) from the start. In contrast, those individuals with intermediate self-confidence educate before choosing a sector and a contract type. Summing-up, the most able skip education because those in the middle can imitate them too cheaply; however, those in the middle educate to distinguish themselves from the least able people. These principles can, in principle, be applied also to the decision of education versus work in the broader context of global labour markets and also to the relation between education and taxation (Bergman, 2003).

## 5. Political economy determinants of migration

Economic, social, and cultural factors are very important causes of the international mobility of talent. However, they do not exhaust the list of factors that affect that mobility. Governance and political factors also influence the decision by talented individuals to migrate. The political regimes prevailing in host and source countries—democracy or authoritarianism—and also the quality of democracy matter in the decision to emigrate or leave a country. In general, it is reasonable to assume that individuals will prefer to live in countries where civic freedoms and individual rights (freedom of speech and association, access to fair trial, religious freedom, right to elect public authorities, etc.) are respected and economic rights (property rights, contract enforcement) are protected. This tends to occur more often in democracies than in dictatorships. The extent these rights are respected is lower in poorly working democracies than in more mature democracies.<sup>15</sup> As well-educated individuals are more mobile than low-income people we can expect that non-democratic regimes and poorly working democracies are likely to prompt the emigration of educated individuals. This was indeed the case for the Latin American dictatorships of the 1960s and 1970s in Argentina, Brazil, and Chile (after 1973) that impelled the massive emigration of university professors and intellectuals who saw the universities intervened by the military, their research budgets cut and salaries frozen and their tenured positions affected by political considerations. As a consequence of hostile public policies towards universities and independent think tanks these countries suffered serious brain drain with consequences not easily reversible. In these cases, emigration (very often of individuals with a high stock of human capital) became an individual response to non-democratic political regimes that fail to respect civic rights.<sup>16,17</sup> In general, countries that live through periods of conflict, civil war, and violence often do not create a good environment for domestic science, arts and creativity to flourish. The result is an emigration of talent to more favourable environments.

<sup>15</sup> See Olson (2000) for an insightful analysis of the economic consequences of democracies and autocracies. In turn, Albert Hirschman provides a view relevant for understanding the relation between politics and migration. In *Exit, Voice and Loyalty* he draws a distinction—useful to understand the economic and political causes of immigration decisions—between purely economic choices and collective action. While *exit* is often an economic decision, *voice* belongs to the realm of collective or political action. This framework suggests that individuals, who are unsatisfied or discontent with current political and economic conditions in their home countries and where “voice” becomes an ineffective expedient to change things, may choose to exit their countries (i.e. to emigrate). Thus (voluntary) migration (different from the problem of refugees and asylum which are instances of forced migration) is a decision also affected by political conditions that are considered inadequate by nationals and foreign residents.

<sup>16</sup> Emigration was generally restricted in former socialist countries. One of the justifications for restricting exit and emigration was that educational and other social investment made by the state on citizens would be lost by emigration. However, given the lack of civil liberties and the poor economic performance of these regimes, particularly in their phase of maturity and then decline, it is likely that the outflows of people would have been sizeable under liberal emigration regimes with the ensuing political and economic costs for the regimes. However, emigration was used in controlled and selective fashion to get rid of political opponents and dissidents.

<sup>17</sup> For an interesting, albeit dramatic, account of how emigration of the most talented individuals of the German Democratic Republic was used, as a state policy during communism, to get rid of active opposition and discontent, debilitated the GDR to the extent that it contributed to its unexpectedly rapid demise after the end of the communist regime in 1990, see Hirschman (1995).



## IV. Development impact of the mobility of talent

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At an aggregate level, the economic literature evaluates the developmental and global effects of the emigration of talent as emigration of human capital (or emigration of highly skilled labour). Early analysis based on neoclassical growth models with human capital as a factor of production, showed that the emigration of human capital reduces the stock of human capital and output in the source country and increases it in the receiving one.<sup>18</sup> In addition, there can be a loss of welfare for the remaining population in the home country because of externalities due to a loss of scarce skills. As the high skills emigrants are individuals with a large endowment of knowledge, they generate positive externalities that may be sector-specific (i.e. the output of academics depends on the availability of a mass of researchers) as knowledge generation is an activity with increasing returns (see Solimano 2004a). The externality argument implies that the social marginal product of a highly skilled emigrant is greater than his private marginal product.

A permanent emigration of high-skills individuals can retard economic development in sending nations that can enter a phase of stagnation in the development of local science, technology and knowledge

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<sup>18</sup> See Solimano (2004c) for a discussion of emigration of human capital and its impact on developing countries and the global economy. Earlier analysis of emigration of human capital and brain drain include Johnson (1964) and Patinkin (1964), collected in Adams (1964). More recent treatments and empirical analysis of emigration issues include Haque and Kim (1994), Carrington and Detragiache (1998), Sutcliffe (1998), UNESCO (2001), and OECD (2002).

following the outflows of talent.<sup>19,20</sup> In turn, the receiving countries can benefit from increased knowledge gained from the immigration of talent, creating a virtuous circle in which foreign talent combines with domestic talent strengthening the overall human capital base in the host country. In the process, permanent emigration of the highly skilled may amplify international disparities in the endowments of qualified human resources capabilities between source and receiving countries. However, the emigration of talent can also have positive effects for the source countries as well in terms of remittances flows, mobilization of fresh capital accumulated by the emigrants when they return home, exposure to new technologies and managerial techniques, contacts abroad, etc.

*World income* should be higher with more mobile human capital, as the marginal productivity of human capital will tend to be equalized around the world as it moves from countries with lower marginal productivity to countries with higher marginal productivity. As result, there are *global efficiency gains* from increased international mobility of talent.<sup>21</sup> This analysis, however, does not consider the *international distributional impact* of the costs and benefits of such migration flows between sending and receiving nations.<sup>22</sup> As we shall see later, income distribution effects are different for sending and receiving countries.

## 1. Talent migration and growth

The relation between growth and international migration of talent in the *country that receives* the migrants can reflect a mutual causality: rapid growth, expanding opportunities, technological discoveries and land availability in the host country generates a demand for unskilled labour and talent as the domestic supply of those human resources may be insufficient to meet the increased demand. Then growth and opportunities may *precede* the mobility of talent. Historically this was the case of Argentina and other countries of the New World at the end of the nineteenth century that received large contingents of European migration both of workers but also of people with entrepreneurial capacities. A main recipient of migrants in the late nineteenth century and early twentieth century was Argentina, a country that experienced rapid rates of output growth and net immigration, mainly from Spain and Italy (see Solimano 2004b). In turn, massive immigration allowed the mobilization of the large natural resources of the receiving countries and that was a key engine in their growth process. The other part of the mutual causation process is that immigration is an important factor in *sustaining and reinforcing* the dynamics of growth and prosperity. In fact, the immigration of people with entrepreneurial capacities and a favourable attitude towards risk-taking contributed to business creation, resource mobilization, colonization and innovation—all factors that supported rapid economic growth—in the countries of the New World in the first era of globalization (pre-1914); see Solimano and Watts (2005).

More recently, in the 1990s, entrepreneurial immigrants from India, Taiwan, and China have provided an important human resource in the creation of high technology industries both in

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<sup>19</sup> Remittances are a factor that should be also considered in assessing the benefits and costs of emigration of human capital. However, perhaps even more important than monetary remittances is that returning high-skilled migrants can bring new knowledge acquired in advanced countries and venture capital useful to create new business and innovate in their home countries (see Solimano 2004c).

<sup>20</sup> The previous analysis assumes that talent emigrates permanently. In practice, talent circulates rather than emigrates permanently. Talent may pay frequent visits to the host country, remain engaged with professional organizations, universities, and other local counterparts and thereby contribute with their talent to domestic development at home as well. More generally, in a world of instant communication, accessing ideas and knowledge may not require, as a *sine-qua-non* condition, the physical presence of the person that generates (or is a specialist) in that knowledge. Of course this is, ultimately, a matter of degree and still the benefits of ideas are likely to be greater when the human capital (a person) interacts directly with other people.

<sup>21</sup> See Patinkin (1968) and Ellerman (2003) for critiques of the concept of global welfare gains associated with international migration of high skills individuals.

<sup>22</sup> See Easterly (2001) and Solimano (1998; 2001).

hardware and software in Silicon Valley in the United States. They have engaged in business creation and output growth in the tech sector contributing to economy-wide growth.<sup>23</sup>

In the *source countries* an outflow of entrepreneurs may depress innovation and growth. Likewise an outflow of people with high educational levels reduces the stock of human capital with a depressing effect on growth in the sending country.<sup>24</sup> This is the traditional *brain drain* effect. However, this is not the end of the story as emigration raises the returns on investment in human capital (under decreasing returns as the stock of human capital is lower) thereby inviting more investment in education with future positive growth effects in the medium and long run. In this case, the “drain effect” of emigration of talent has to be counter-balanced with the “brain gain” effect (see Beine et al. 2001). At the same time, if emigration follows a cycle and the emigrant returns home bringing fresh capital, contacts, and knowledge, we have a positive development effect for the home country. In Taiwan in the 1980s and 1990s, the formation and development of Hsinchu Science—based Industrial Park (HSIP) greatly benefited from the return immigration of Taiwanese entrepreneurial and engineers from Silicon Valley (Saxenian and Chuen-Yueh Li 2003). In fact, several of the successful Indians and Taiwanese in the high tech industry in the US also set up software and hardware companies in their home countries contributing to growth in the source countries (see Saxenian 2000; 2002; 2006).

## 2. Talent migration and inequality

Overall migration affects global income distribution at three levels: a) in the sending country; b) in the receiving country, and; c) inequality between countries.

Economic historian Jeffrey Williamson, considering the process of *mass migration* of the first wave of globalization of c.1870–1913, asserts “Where immigration increased the receiving country’s labor supply, inequality rose sharply; where emigration reduced the sending country’s labor supply, inequality declined” (Williamson 1997). Therefore, inequality should have *declined* in Europe (source region) and *increased* in the US, Canada, Argentina, Australia, and Brazil (recipient countries) in the first wave of mass migration of the late nineteenth century and early twentieth century. In fact, historical trends show that “When emigration trends were big, egalitarian trends were strong; when countries had to accommodate heavy immigration, inegalitarian trends were strong” (Williamson 1997: 129). In principle global inequality, say inequality between countries, must be *reduced* with international migration as people move from relatively low wage countries to nations with higher wages, thereby reducing the real wage gaps between sending and receiving countries. This is, in turn, a key element in the whole discussion about *convergence*.<sup>25</sup> An

<sup>23</sup> Various mechanisms can account for a positive effect of migration on economic growth in receiving countries (see Solimano 2001). The immigration of unskilled labour can help to increase and sustain growth in the host country by moderating the growth of wages therefore contributing to keeping profits high, raising the profitability of investment, and accelerating growth. These two mechanisms: i) the transfer of entrepreneurship and highly-skilled people, and ii) an increased labour supply of unskilled workers, operate essentially, through *investment and productivity growth* (see Solimano 1998). An additional macroeconomic mechanism from migration to growth operates through *savings*. International immigration may raise savings in the host country by keeping wages down and boosting profits. As profit-earners tend to have a larger propensity to save than wage earners, the net result is an increase in overall national savings. In a savings constrained economy this should be translated into more rapid economic growth.

<sup>24</sup> If the emigrant comes from activities of low productivity in the source country—say from the urban informal sector or from traditional agriculture—their removal from production may have a low effect on the level of domestic output. Moreover, if the emigrant is unemployed in the country of origin, then output will remain unchanged. In the medium term, emigration may lead to real wages rises as the labour supply declines, and this may in turn reduce profits and investment.

<sup>25</sup> It is estimated that around 70 per cent of the wage convergence in the “Atlantic Economy” (Europe, US, Canada) between 1870 and 1900 is explained by the collapse of the wage gap between Europe and the New World following massive international migration from the former to the latter (see O’Rourke and Williamson 2000). The story of convergence is one of lower real wages in labour abundant nineteenth century Europe catching-up with higher wages in the labour-scarce New World. In addition, lower-wage countries such as Argentina and Canada were catching up with higher-wage countries such as the US and Australia. By the late twentieth century, the wage gap between Argentina and the then developed countries had widened as the US, Canada, and Europe

important effect of international migration in that period was to contribute to convergence of per capita national income levels and factor prices in the Atlantic Economy. However, this is a story of *mass migration* and we are considering here the migration of talent that is less important in quantitative terms in affecting overall factor prices as it was the case with mass migration process of the first wave of globalization of the late nineteenth century and early twentieth century. In the case of mobility of talent we can expect changes in the micro remunerations of different types of talent (technical experts, professionals, scientists, entrepreneurs, artists) depressing (relatively) their remunerations in the recipient countries and increasing them in the source country. Recent empirical evidence reported in Freeman (2006) shows large gaps in earnings for different occupations (workers, professionals, scientists) among countries that provides evidence of a low lack of integration in international labor markets for talent.

Another story can be told using endogenous growth models with externalities from human capital to productivity growth. These models would predict that the movement of human capital from low income countries to rich nations may tend to *widen* income per capita differentials over time if the increase in human capital spurs more rapid productivity and output growth in the receiving country and reducing growth in the source country. Over time, this will increase the gap in per capita income levels between source and recipient countries due to differences in GDP growth rates among them. Thus, under increasing returns, the international mobility of talent and human capital can *widen* global inequality (return migration can moderate these inequalizing effects).

### 3. Other development effects of talent mobility

At a more disaggregated level we can highlight the talent impact on six critical areas:

- a) The development of science and technology (particularly relevant for the mobility of scientists and technical talent) in home and receiving countries.
- b) The quality of service delivery in domestic health sectors, whose professionals (medical doctors, nurses) emigrate.
- c) Impact on business creation and innovation following the mobility of entrepreneurs and managers.
- d) Impact on quality of public policy-making in the source country associated with emigration of professionals in the public sector.
- e) Effects on fiscal revenues and the size of the middle class associated with international flows of professionals and entrepreneurs.
- f) Impact on cultural variety and identity associated with the mobility of cultural talent.

Additional effects of talent mobility refer to the impact of talent mobility on fiscal revenues; on the return of public investment in higher education and on the size and stability of the middle class, often a stabilizing segment in developing countries.

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turned into the highest per capita incomes in the world. With the onset of the First World War this process of convergence in wages across the Atlantic economy abruptly stopped.

## V. Elements of a policy–research agenda on talent mobility

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From the previous discussion we can identify the following elements of a policy and research agenda on talent mobility for global development:

- i. Filling the *information gap*, particularly in developing countries, on the magnitude and characteristics of talent mobility. Many developing countries simply do not know how many of their scientists, technology experts, physicians, university professors, entrepreneurs, and artists are abroad. In developed countries the statistical base on the mobility of human resources is better. For example the OECD has developed a system of recording and of building a statistical and analytical base of the Human Resources devoted to Science and Technology (HSHR) in the OECD countries. Developing countries should strengthen their statistical capabilities on the mobility of high skills and educated individuals.
- ii. To add in the *development agenda* the topic of talent mobility, it is important to recognize that increased mobility of high skills individuals often implies that developing countries (at least in a certain phase of their development process) are exporting talent and that part of their most qualified stock of human wealth is beyond their national borders. As with financial capital, human capital emigrates when the incentives structure at home is distorted and the value of talent is not properly recognized. Future research in the topic should identify sound policies to attract talent to the developing countries.

- iii. To enable talent circulation for global development may require action in several fronts. As mentioned before, countries such as India and Taiwan have been successful in building a domestic high tech industry that is internationally competitive. A critical contribution to this has been made by expatriate entrepreneurs and technology experts that have been successful in the US, UK, and other developed economies. Boosting *connections* among entrepreneurs can increase the international circulation and mobility of capital, technology, and managerial capacities. To attract human and financial capital back home may require some *favourable tax treatment* in the initial stage. *Land grants* for setting up new companies and other subsidies of a temporary, performance-based nature can also be helpful. For scientists and researchers increased connections among universities and research centres at home and abroad are needed. This may involve *cooperation in research projects*, organization of joint conferences, institutional agreements, fellowships programmes and other measures.
- iv. In the cultural sector, international initiatives such as concerts, exhibitions, shows, and cultural exchanges can also promote cooperation and enhance the circulation of talent.
- v. A more general point is the need for developing countries to reassess their *rewards structure* for talent. Poor remuneration, lack of recognition, the absence of professional tracks in public administration, obstacles for business creation and innovation are all factors that lead to talent outflows and brain drain from the developing world.
- vi. National *tax systems* also affect the international mobility of talent as international net income differentials may reflect differences in personal or corporate income tax rates across countries.
- vii. The *relation between education and talent* and its effects on the international mobility of professionals needs further study. From a practical point of view, mobility is affected by the (lack of) international compatibility and recognition of university degrees and professional titles earned in foreign universities. The integration of higher education would need some common framework that would enable comparing the diverse national education systems (incidentally this is the “Bologna process” in the European Union).

## VI. Concluding remarks

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In the 1960s and 1970s the discussion on talent mobility was dominated by concerns on brain drain. The dominant view at that time was that permanent emigration of talent from the developing countries had adverse consequences for national development, autonomous policy-making, and qualified human resources. In the early twenty first century, the international circulation of talent has increased significantly as we are living in a world of increased economic interdependence, rapid technical change, and lower transportation costs. The direction of talent circulation is multiple: south-north, south-south, north-north, and north-south; although, as the substantial difference in the levels of development between rich and poor countries remains, the “south-north” migration of talent predominates. Individuals with special abilities move across countries in response to economic incentives and clusters of expertise, which concentrate in certain locations. That talent may eventually return home if the appropriate conditions for work and investment exist in their source countries. The causes of the outflow of talent reflect failures in rewarding talent in developing countries as well as superior paying structures and better work opportunities in advanced economies. Distortions of the reward structures against innovation and productive activities may produce a sub-allocation of talent in growth-oriented activities and/or in an outflow of talent to foreign countries that provide better opportunities for wealth creation. Rent seeking, patronage, and the politicizing of professional appointees in national and international public administration is another deterrent for talent interested in public policy. An agenda of talent mobility that works hand in hand with global development is required to address these issues.



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