The interest in research on brain drain

There have been two waves of increased academic attention paid to brain drain. The first time that concern about emigration of skilled human resources was high was in the 1960s. The massive scale of overall migration flows from the countries of the South towards the North, accompanied by problems arising from an increased number of refugees and asylum seekers, occupied much of the attention of the political and academic worlds at this time, and studies on brain drain reached a peak. Later, the issue of the movement of skilled human resources was relegated to the background by other hot topics. In the mid-90s, the intensification of globalization processes, the increased drive towards technological development and services, and the subsequent demand for skilled human resources in the developed world brought the problem of skilled emigration back into the arena of political debate. In consequence it reappeared also in academic works, and it continues to hold the attention and interest of researchers to today.

Definitions: brain drain, gain, waste, exchange, circulation, reverse brain drain

The Royal Society in the UK first coined the expression “brain drain” in order to describe the outflow of scientists and technologists to the United States and Canada in the 1950s and early 1960s. Brain drain can occur not only when individuals educated in their home country emigrate in search of higher wages or better opportunities, but also when individuals who studied and completed their education abroad do not return to their home country. The first form is arguably worse, because it drains more resources from the home country - the talented individual, the public investment in their education, and his or her future possible positive externalities. “Brain drain” is defined by the encyclopaedia Britannica as the “departure of educated or professional people from one country, economic sector, or field for another, usually for better pay or living conditions”. Not all skilled migrants are in search of educational, economic, or intellectual opportunities. Sometimes they are forced to leave their homes as a result of war, or of political, ethnic, or religious persecution. Brain exchange implies a two-way flow of expertise between a sending country and a receiving country, but where the net flow is heavily biased in one direction, the terms “brain drain” and “brain gain” are used. This latter also refers to the positive impact of skilled immigration on educational
choices among those who stay in the home country, but who are considering following their successful compatriots abroad, but who finally do not leave (increased incentives for obtaining education), and also to the transfer of knowledge, skills, and ideas by returnees (increased skilled and internationally experienced human capital). The 1997 OECD report on the movement of highly skilled people identified a further term, “brain waste”, which describes the waste of skills that occurs when highly skilled workers migrate into forms of employment that do not require the application of the skills and experience employed in the former job and/or obtained via education. Recently, there has been a new concept introduced into the debate, namely “brain circulation”, which some use to refer to the cycle of moving abroad to study, taking a job abroad, and later returning home to take advantage of a good opportunity. Such circular migration has been observed, for example, amongst Malaysians who have studied in Australia. This form of migration is expected to increase in the future, especially if economic disparities between countries continue to diminish. Reverse brain drain can occur when scientists or engineers migrate to a more developed country to study in its universities, to perform research, and/or to gain working experience in areas where education and/or employment opportunities are limited in their home country, and after several years of experience, they return to their home country to start a related business, teach in a university, or work there for a multi-national company. Likewise, reverse brain drain can also occur when scientists or professionals migrate to a more developed county and then actively promote as beneficial the practice of offshoring high-tech service jobs, technology, and knowledge transfers to their home country. When the corporations of developed countries train and outsource engineering, software, and/or product design to lower cost countries such countries as China, India, and Russia - looking to reduce cost or to forestall bankruptcy - reverse brain drain can also result. These companies are, in effect, outsourcing their brains and creativity and gradually, it may erode their capacity to generate new products and services. The problem of a reverse brain drain is exacerbated by the crisis in developed countries whereby there is low interest in engineering and science, or in continuing to advanced degrees among undergraduate students of these disciplines, which leads to the widespread replacement of native-born engineers and scientists with foreign-born ones in the areas of the greatest intellectual and economic interest for developed countries. At the same time, migrants from China and India are increasingly motivated to return to their home countries, thanks to rapid economic growth, improving living standards, and increasing opportunities emerging there.
Definitions of highly skilled and skilled workers

There is no generally recognized definition of the highly skilled worker. Popularly, highly skilled workers are individuals whose job requires knowledge and experience equivalent to a higher education/university degree, or those with scientific or technological training obtained through the completion of third level education. According to the definitions cited by Özden, skilled workers are those with an average education of at least 16 years, and include managers, accountants, engineers, social workers and teachers, medical and legal professionals, and scientists. The same author defines semiskilled workers to be those with an average education between 12 and 16 years, including engineering technicians, police, secretaries, and administrative assistants. (Özden, 2005).

Looking for positives - dimensions of brain gain in the contemporary world

Traditionally it is concluded that the emigration of skilled labour has a negative impact, and solely a negative impact. Recent research findings have undermined this so-far monolithic view, with its clear connotations that skill flow is purely detrimental to the sending country. For several reasons, this does not seem so obvious any more. First, many skilled emigrants serve the countries they come from for long periods before departure, paying back the country’s investment in their education. Second, in the case of large numbers of skilled student-emigrants, their higher education is funded by themselves or by foreign scholarships. Third, after some years, émigrés come back with augmented skills, social networks, and wealth, and are better equipped to contribute to their home economies than if they had never left. Fourth, the migration of a skilled worker may also have some channels of positive feedback, such as the remittances he/she sends home, schooling incentives for his/her relatives, his/her acquaintances who would like to follow his/her professional path abroad. Fifth, one’s return after gaining capital and experience, including experience gained within the diaspora social group itself, may foster domestic development. So according to this new approach, the movement of skilled workers from poor to rich countries may in the long run benefit both.

There are, however, some reservations to the above listed benefits. The opportunity to migrate motivates individuals to invest in education with a view to emigrating in the future. Not all of those who undertake education with the plan of going abroad finally emigrate, and this is a gain, but only if the profile of education gained with emigration in mind is searched for locally. Moreover, such positive impact on schooling also may have equally negative outcomes, such as family disintegration or lower parental supervision, which can result in
declining school attendance and results. Remittances are the second-largest source of external finance for developing countries, and remain a stable source despite economic crises, wars, and natural disasters. The money that migrants send back home does indeed help to alleviate poverty in their former home, to relieve child labour, to increase household expenditure on education and health, and to spur on business activity. But sometimes it blocks the activity of receivers, who come to solely depend on the relative abroad, and it may even happen that those remaining behind (“TRB”) may become passive and just consume the received support. Furthermore, having obtained additional skills, the return migration can certainly contribute to the economic development of the source countries. It has positive externalities when migrants return with experience, deep knowledge of good governance and organization of work, financial resources, links to networks, and skills acquired abroad - and this capital can be productively, effectively, and wisely deployed at home. But not every economy or country government is capable of or has a policy of taking advantage of such a return of the skilled. Hence the generalization that skilled emigration from a certain country, region, or social group has solely negative or solely positive consequences may be misleading.

There is also a difference in seeing possible positives in a wider (global) and narrower (national) perspective. Instead of viewing skill flows in a context narrowed to merely national development, the supporters of the global development dynamic model claim that emigration globally encourages more skill-creation than skill-loss. This happens mainly through creating improved incentives to acquire human capital, which positively influences growth (Commander, Kangasniemi, Winters, 2003).

There are several trends in the brain drain/gain equilibrium which can be observed in the contemporary globalized world. First, there is a shift to virtual mobility and brain circulation. Recent advances in communication technology has limited the extent to which talents are physically lost; the work can be done remotely, and linking via modern communications institutions and individuals in developing and developed countries may occur without inducing spatial migration. New global roles for nongovernmental organizations, as well as the range, scope, and power of multinational corporations, and the ease of travelling, have all mitigated the effects of out-migration among highly skilled professionals and introduced a circulation of brains. The globalization of companies fuelled temporary flows. University researchers and qualified employees in multinational corporations circulate rather than migrate. Second, we observe increasing complexity in both phenomena, as well as their subtle and deep relations with the socio-economic state on the micro and macro scales. Third, the mobility of the skilled can be considered to be a positive
phenomenon from the point of view of global innovation. The emerging benefits come only gradually to light - there is a transfer of knowledge, skills, ideas, and capital to poorer countries, as well as a skill flow which generates mutual and global benefits. Mobile talents play a complex role in global development, contribute to shaping a better societal climate and reforms, positively affecting the quality and delivery of public and private services. International mobility of skilled workers can generate global benefits to research, innovation, and entrepreneurship. There are a significant number of foreign-born US Nobel Prize winners or creators of global high tech companies, such as Intel, eBay, and other successful start-ups. Émigrés develop their expertise, accumulate more skills, gain experience of western practices, and increase their network of contacts - all of which can be of great benefit to the future development of their countries. The question is to create proper research conditions for those who have the capacities to push the economy forward, regardless of which country they are located in.

**Negative consequences of skill flow that cannot be offset by brain gain**

Although the mobility of the skilled can be considered to be a positive phenomenon from the point of view of global innovation, on the contrary on the national level the migration of the skilled, in specific conditions, is an obstacle to local development and may even aggravate underdevelopment, depriving poor countries of their scarce human resources. The characteristic attribute of international migration of workers is its selectiveness. Countries receiving the largest numbers of immigrants have introduced selective policies favouring educated people. In effect, the world’s poorest countries are trapped in unending cycles of deprivation: the lack of education, healthcare, and economic opportunity perpetuates these same conditions for future generations. A society’s collective inability to foster positive change leads to passivity and deepening problems. The technological gap between countries at various stages of development continues to grow. Of all the talent lost from developing countries, the loss of medical professionals is perhaps of the greatest concern; this topic has been widely studied, and is commented on in other parts of this publication.

Many small countries, principally in the Caribbean, Central America, and Africa, suffer from very high skilled migration rates. Countries with greater demographic potential have larger populations of skilled people, so that even with a large share of skilled people in the migrant population, their share in the entire country’s skilled population is still small. On average, among countries with more than 30 million people, the brain drain of all tertiary educated people is about 5%. The largest states, such as China, India, Brazil, Indonesia, and
Russia have about 3–5% of their graduates living abroad. By contrast, in sub-Saharan Africa, skilled workers only make up 4% of the total domestic workforce, but these skilled workers comprise more than 40% of people leaving the country. Beine, Docquier, and Rapaport, using recent US data on migration rates by education levels relating 150 countries, found that most countries combining low levels of human capital and low migration rates of skilled workers tend to be positively affected by the brain drain. In contrast, the brain drain has negative growth effects in countries where the migration rate of the highly educated is above 20%, and/or where the proportion of people with higher education is above 5%. An obvious and noted regularity is that countries with higher GDP per capita have lower skilled migration rates.

*Country and region cases*

For the cases to be analyzed we chose countries representing different rates in both categories. From Black Africa, Kenya from the heart of the continent, was chosen. Its population abroad is in the top ten among African countries, and it is also among the top five African countries suffering from brain drain; it is, therefore, a significant case to consider. The second reason comes from anecdotal evidence that most Kenyan immigrants experience brain waste in developed countries.

From Asia, the cases of the Philippines and India will be analyzed. While African and Caribbean migration from the domestic medical sector causes local shortages of nursing and a drain of public schooling subsidies, in the Philippines the situation is quite different and therefore worth presenting. The drive towards massive emigration of Filipino nurses has created more nurses than go abroad, and it is not connected with adverse fiscal losses. The reason for this is that an enormous system of private medical education has arisen there, encouraged by the government, and the large majority of emigrant Filipino nurses pay for their education, either in advance or else afterwards, by paying back instalments, or having them paid back by their employer. The Philippines has created one of the most effective government bureaucracies in charge of promoting, facilitating, and managing migration. India will be analyzed because of the recent and enormous reverse trend in the brain drain that had lasted for decades. There is little exaggeration in the words of this journalist of Indian origin in the US who believes that brain drain from India is coming to an end: “it would be apt to say that the Indian professionals who once went abroad for greener pastures, are returning for the greener pastures in India now!! A good challenging job, attractive compensation package, good life, has reversed the tide and this is a great time to look for an appropriate and suitable opportunity in India” (Sandip, 2009).
In Latin America, the topic of a brain drain is not as hot as in other regions, namely in black Africa and the underdeveloped regions of Asia. Mexico is exceptional because of different brain gain mechanism and because of significant brain waste. As a second country from Latin America, Nicaragua, with one of the highest brain drain, will be investigated.

Apart from South-North brain drain, receiving countries have also noted outflows of skilled personnel. This is why some data and trends connected with the USA, as a main global player in the worldwide battle for talents, will be presented. The reversed brain drain found there is not great, but has recently been attracting more and more concern. The situation in other parts of the world will also be briefly presented, including EU internal and external flows of educated professionals.

**Africa**

There are a number of consequences of brain drain in Africa: the countries of this continent lose their best human resources and the funds invested in training them, and then additionally have to pay to employ expatriates to fill abandoned positions. This is a well-known effect, yet the overall and up-to-date statistics on these losses and burdens on the continental scale are not available. Nigeria, Kenya, and Ethiopia are believed to be the most affected in absolute numbers by the outflow of skilled workers, higher percentages of educated people leave also Mozambique (30%) and Ghana (26%). Between 1960 and 1975, higher educated Africans migrated at the rate of about 1,800 a year. According to a 2000 UNESCO report, there were over 300,000 highly qualified Africans scattered all over the world, 30,000 of whom had PhDs. In 2005, Docquier and Marfourk noted that, although sub-Saharan Africa migrants constituted only 3.7% of OECD immigrant stock, they were 4.75% of OECD skilled immigrant stock. It is believed that in Africa only 2.8% of people are skilled. This proportion is low, and the large-scale immigration of skilled capital from Africa effectively makes it even smaller. As for calculations of lost investment in educating future migrants, these are available only for a few countries, and the methodologies used for these assessments are not harmonised (Docquier, Marfourk, 2005). Regarding replacement costs, it is estimated that Africa pays around USD$5.6 billion a year on employing foreign specialists, although some African countries such as Nigeria still have enough skilled labour residents, and do not need to hire expatriates for abandoned job positions.

These effects of brain drain in Africa have been discussed in political and scientific circles worldwide, especially in the context of significant loses of medical personnel. In Africa an especially difficult situation is noted in access to medical services. According to a
report by the World Health Organization, more than four million additional health professionals are urgently needed in 57 countries, 36 of which are in sub-Saharan Africa (WHO, 2006). However, this figure of four million health professionals is much greater than the number of African doctors and nurses practicing abroad. This fact shows clearly that the outflow of medical personnel to other countries is not the only reason for the drastic situation in the health care sector in Africa. Recently, the African brain drain dispute has gained a new dimension - it is viewed as a factor threatening the achievements of the Millenium Development Goals for Africa. In the contemporary world, the generation of new knowledge and its application changes human living conditions and moves societies towards wealth and democracy, but only if the region/country concerned has a critical mass of human resources. If Ethiopia loses a dramatic 75% of its skilled workforce, as happened in the years between 1980 and 1991, and which according to the UNDP is still happening, it obviously harms the ability of the nation to escape from poverty. There are significant differences across the continent. The opposite situation to the Ethiopian one is noted in South Africa - although many professionals, fluent in English, chose to remain in the United States or the United Kingdom after they completed their graduate studies, South Africa has nonetheless made significant strides in luring its professionals back, a feat which is easier for this country, which has emerged as Africa’s most dynamic economy.

**Kenya**

Almost half of Kenya’s population lives in poverty, nevertheless across the society there are great differences in terms of living conditions and access to key services and infrastructure (The World Bank Report, 2008). Despite significant and ongoing internal migration towards cities, about 80% of Kenyans still live in rural areas. Urban wages are nearly twice as great as rural ones, which leads to a concentration of professionals in Nairobi and other cities. Apart from that, external migration occurs, which additionally deepens personnel shortages in institutions providing services in rural areas (Hamory, 2009).

Docquier and Marfouk (2006) have analyzed the levels of international skilled emigration to OECD countries in 1990 and 2000, and have placed Kenya in the 29th position, with an emigration rate of 38.4%. When the sample was restricted only to countries with populations over 5 million, Kenya ranked fourth in brain drain intensity, while among African countries, it occupied third place. The number of arrivals of skilled workers from Kenya to the EU-15 was only 38% in 2000, in a sharp contrast to the 82% who arrived in the USA. These authors found that the share of emigrants with tertiary education is much higher than the share
of the unskilled. A significant imbalance also concerns emigration rates in terms of education level. In case of emigration to the USA in 1990, 11% of émigrés from Kenya were educated at tertiary/university level, while only 0.2–0.3% of those with only secondary education, and 0.1% of those with only primary educated were admitted (Docquier and Marfouk, 2006). These findings show that Kenyans, and African immigrants in general, are more likely to be skilled.

There is anecdotal evidence that most Kenyan immigrants who arrive in developed countries experience brain waste. For the 1970s Kenyan cohort with a bachelor’s degree living in the US, the probability of obtaining a skilled job was 34%. In 1980s it increased to 38%, and in the 1990s to 59%. About 71% of Kenyan emigrants with a master’s degree were getting skilled jobs, and 63% of those with professional/bachelor degrees, which demonstrates that brain waste is less common among migrants who hold advanced degrees.

Kenyan émigrés send money home to support a wide range of relatives. In 2005, remittances from Kenyans abroad officially came to about USD$500 million (World Bank, 2006). At the same time, an estimated USD$3 billion dollars are lost yearly on Kenya’s health professionals abroad (Kirigia et al., 2006), which makes the USD$500 million of remittances from all Kenyans abroad seem insignificant. Nevertheless, the calculation of loses may be somewhat overestimated (Clemens, 2009) and the real amount of remittances is not known.

The number of Kenyan physicians in 2002 was 4505, which is 1.4 per 10,000 inhabitants; the numbers for nurses were respectively 37,113 and 11.8; for pharmacists, 3,094 and 1.1. These indices need to be at least doubled in order to meet the minimum of the WHO’s “Health for All” standards (Mills et al, 2008). Besides the statistical overall shortages in personnel, Kenya also experiences problems with balanced and sustainable access to health services in rural and remote areas, caused both by natural demographic trends but also by local law, whose efficiency is questionable. Only 8.3% of the population live in the capital, but that city has 65.8% of the physicians, according to the Kenyan Ministry of Health. In 2006, there were around 6000 trained and licensed, but unemployed, registered nurses in the country, because of regulations that forbid even a highly-trained registered nurse with less than ten years of work experience from opening a private clinic without the supervision of a physician. This rule makes the employment of nurses strongly tied to the existence of physicians, whose education is very expensive. According to Clemens, “regulations of this kind blocked access to basic health care in the least served areas, as well as increased a pressure for unemployed nurses to emigrate” (Clemens, 2009). Unfortunately, there is no strong evidence that Kenyan health professionals working abroad ever return home after
having working for a few years, in order to share their augmented medical expertise acquired abroad.

The 2002 election of president Kibaki brought expectations of change in political and social life in Kenya. There was anecdotal evidence corresponding to these hopes, that “a wave of Kenyan professionals abroad are returning home with the hope to rebuild a country that had nearly collapsed under the weight of 24 years of rule by former President Moi” (Oyelere, 2006). The case of Barack Obama is another strong positive signal; as the highly educated son of a Kenyan, he is inspiring to children and youths, and helps them believe in education and their potential for development and achievements.

**Latin America**

Until the mid-twentieth century, Latin America was a region which received migrants, a place where Europeans, Asians, and Africans settled and integrated with local societies. The Immigrants Museum of Argentina has records of about 5 million people who arrived at Argentine ports between 1857 and 1920. Other calculations estimate that between 1870 and 1950 this country accepted around 6 million European immigrants, especially from Italy and Spain (Solimano, 2008). Internal flows took place mainly between bordering countries and, to a lesser extent, between the sub-regions. Argentina, Venezuela, Costa Rica, and Mexico were the biggest recipients of migration flows from neighbouring countries. This was labour migration, intermingled with temporary waves of political exiles. Until the 1970s, Argentina kept its doors open to immigration, did not require visas, and was perceived as a place where it was relatively easy to settle and work. Later, during the seventies and eighties, which saw dictatorships of various kinds arising on the continent, Argentina and Venezuela still did not obstruct the passage of foreigners.

For a relatively long period - from 1950 to 1975 - most Latin American countries experienced a sustained economic growth of 5.5%, averaged over the continent, which was higher than in the industrialized countries of the time, and also higher than observed in other developing regions. The modernization of Latin American economies and economic growth around the middle of the twentieth century allowed the development of educational systems and increased the quantity and quality of the educated elites. In the 1970s, some countries on the continent started to show symptoms of the crisis, while others, such as Brazil, Colombia, the Dominican Republic, Ecuador, Guatemala, and Paraguay, maintained previous levels of economic growth. In the 1980s, however, the “debt crisis” had become widespread on the continent, triggering a decline in per capita GDP for all countries. As an effect of the
economic crisis, migration flows toward Venezuela and Argentina (formerly the principal receiving countries in South America) stagnated, while flows toward the USA and other developed countries increased, to become dominant in the last decades of the twentieth century. The number of persons born in Latin American and Caribbean countries residing in the US increased from one million in 1960 to more than 14 million in 2000, a fact which is visible from censuses, which, however, do not reveal the significant number of illegal immigrants. Latin Americans also aimed towards European states, which although having restricted the entry of immigrants in 1974, were still receiving significant contingents of refugees and political exiles. European countries that had acted as sources of migration to the Western Hemisphere in the nineteenth century and the first half of the twentieth century, now began to accept Latin American citizens who were the descendants of former European immigrants. For example, in 1975, after the independence of Suriname from the Netherlands, Surinamese people - including a majority of highly-educated people - emigrated, mainly to the Netherlands, where there currently live more than 300,000 Surinamers. Canada and Australia also admitted many Latin Americans.

The majority of migration from countries in Latin America is aimed at the United States. The flows to the rest of the OECD make little difference in migration calculations, which makes the results derived for the United States essentially valid for all Latin American flows. From Guyana - a country with one of the largest brain drains - more than 70% of individuals with tertiary education have moved to the United States. Çağlar Özden’s report presents certain patterns among the highly educated migrants from Latin American countries (Özden, 2005). Generally, all the small islands in the Caribbean are losing professionals in proportions corresponding to those of sub-Saharan Africa. The rate of the migration of workers with at least a college degree is extremely high, especially from some of the smaller and less developed countries that have failed to establish adequate labour market opportunities for their educated citizens. For example, as of 2000 over 80% of the college-educated people of Haiti, Jamaica, and Guyana were living abroad. As a consequence, college educated workers are also overrepresented among the migrants from these countries, compared to their overall share in the native population. The brain drain has also a strong impact on Panama (57.7%) and Venezuela (60.1%). The latter country is losing professionals at an accelerating rate because of the political situation, which has pushed the middle class - professionals, business owners, and shopkeepers - from the country, fearing for their future under the socialist presidency of Hugo Chávez, who “calls on the slum-dwelling masses to rise up and seize wealth from those better of” (National Science Foundation of Venezuela
In some of the smaller countries in Central America and the Caribbean, such as Grenada and Dominica, close to 30% of the labour force is currently in the US. The index of brain drain is 10% for Mexico, while 27% of migrants from Brazil, 33% from Argentina, 40% from Venezuela, and 30% from Chile arriving in the 1980s and in the 1990s had at least a college degree. Interestingly, Asian migrants yearly receive 64% of the United States H-1B visas, whereas the number given to immigrants from South America accounts for only 6.4% - some 12,000 cases (Solimano, 2008).

The size of remittances is moderate - between 5% and 10% of GDP - but in absolute terms remittances are second (after income from gas exports) by volume of foreign currency receipts (Gray at al, 2009). The World Bank report finds that in Latin America and Caribbean nations, remittance levels are correlated with higher savings rates, better access to health and education, increased macroeconomic stability, entrepreneurship, and reductions in poverty and social inequality. For example, the Guatemala case study revealed that remittances reduced the level and severity of poverty, and added to the income of the poorest 10% of families (Fajnzylber and Lopez, 2006).

Another important observation is that the majority of college educated people who were born in Latin American countries actually completed their education in the United States, and this fact has important implications on the brain-drain debate, since it is not clear whether they should be treated as part of the brain-drain flows and loses. The ratio of migrants from Latin America who had at least a college degree when arrived to US labour market according to the US 2000 census, is much smaller (below 10%), than those who obtained the same level of education in the US - exceeding 40% for Peru, Costa Rica, Bolivia, and Paraguay, and reaching 60% in case of migrants from Mexico, Colombia, Ecuador, Venezuela, and Uruguay. Based on these findings, Özden claims that “if we assume that education opportunities and quality are superior in the United States compared what would have been available at home, then such migration is undoubtedly beneficial for both the migrants and, in most likelihood, their home countries” (Özden 2005). The outflow of college educated migrants is much lower for larger and wealthier countries. For example, their ratio is less than 5% for Brazil, Argentina, and Chile. The cost of educating and losing university workers in Argentina, for example, is very high. It is estimated that during last 30 years, 50,000 Argentines with tertiary degrees have emigrated from their country, of which 20,000 were scientists.

An average cost of educating a person at a university is USD$25,000 so that the amount lost as human capital is between 1 and 2.5 billion USD (Albornoz at al. 2002).
Although in the case of wealthier and larger Latin American countries a smaller proportion of educated people migrate, this forms a larger portion of the migration flow.

Brain waste is more visible among foreign workers of Latin American origin in the US than among those from other regions. Mattoo, Neagu, and Özden point out that majority of Latin American highly educated migrants who have completed their education in their home countries end up with jobs that are not commensurate with their education levels. For example, among those who arrived in the 1990s and had at least a college degree obtained at home, only 36% were offered a skilled job, while another 26% got semiskilled jobs. As a result, close to 40% of Latin American migrants with college degrees perform unskilled jobs in the US labour market. In particular, college-educated migrants from Mexico and Central America seem to perform worse than migrants from South America. At the same time, close to 70% of Chinese and Indian migrants with college degrees have skilled jobs, and this is higher than the placement of US citizens with college degrees (Mattoo, Neagu, and Özden, 2005). This show that migrants from other regions get more impressive job placement offers.

There are some reasons why this might be the case. It may happen because of the way in which the job market weighs the quality of the education and because of various selection effects of the receiving states. Brain waste can be explained by the low quality of human capital accumulated at home, measured in expenditure on tertiary education and valued according to the use of English as a medium of education. Other reasons are the skill distribution in sending countries, the GDP per capita, the distance to the US, and the openness/closeness of US immigration policies to the residents of a particular sending country. For example, because of proximity and the presence of a large migrant network, it is much easier for people from Mexico and Central America to migrate to the United States, including people with lower levels of human capital, whereas in the case of Chinese or Indians, the main path to enter the US is through employment authorization, which requires higher levels of education and experience.

**Mexico**

There are well known images of Mexicans swimming across the Rio Grande, jumping the fence at US-Mexican border, dying in enclosed railroad box cars, meeting death in the hot Arizona desert. Such incidents confronted with racialized immigration policies demand immigration reform (Loyd and Andrew, 2007) But for many years, there has also been a constant flood of other types of Mexican immigrants - wealthy and well educated professionals or students and tourists who decide to stay in the US. “Nowadays, Americans
are benefiting from both gardeners and engineers coming to the United States” - says Jorge Dominguez, professor of Mexican and Latin American politics and economics at Harvard University - “that’s a significant shift in migration patterns” (UPI, 2008). It is calculated that around 6,000 Mexican professionals with PhDs work outside the country. However, between 1991 and 2000, over 2,000 Mexicans with doctorates residing abroad agreed to return to Mexico. They were offered one year of salary support from Mexico’s Presidential Fund for Retention, what cost the Mexican federal government US$56 million (Clemens, 2009).

In 1994, Mexico began its economic integration with the United States and Canada within the North American Free-Trade Agreement (NAFTA). In 2006, Mexicans living abroad, primarily in the United States and Canada, sent an astonishing $20 billion to their home country. These remittances became the largest source of foreign revenues, fuelling the nation’s trade surplus. The case of Mexico is exceptional in terms of the impact of remittances on the educational choices of “those remaining behind” (TRB). People from rural parts of Mexico planning to migrate to the USA have little incentive to invest in education, as Mexicans generally get unskilled jobs there. Furthermore McKenzie and Rapoport (2006) show that the prospect of emigrating from Mexico for low-skill but high paying jobs in the United States might even to diminish investment in education in Mexico. They investigated households supported by migrant family members and found that boys from these families were 22% less likely to complete junior high school (for both boys and girls the investigation result was 15%). Mexican families have to make a principal choice between investing in schooling in Mexico, and investing in arrangements for migration to unskilled work abroad. The latter option is perceived as a short-term and quicker refunding investment.

Close to 17% of migrants arriving in the US during the 1980s had at least a college degree - 10.4% had bachelor’s and 6.5% had a graduate degree; however, the same indices for Mexican migrants are only 2.3% and 1.4%, respectively (Özden, 2005). Since it is relatively easy for migrants from Mexico to enter the US whether illegally or via family preferences, they make up the bulk of migrants at the low end of the education spectrum, concludes Özden. (ibid.)

There have been two waves in the exodus of Mexican professionals. First in 1982–1986, the time of economic crisis when, after the devaluation of the peso, the economy collapsed and many middle class Mexican families moved to the United States, Canada, and Spain. Second, during the last two years of Vicente Fox’s administration, 2004–2006, when employment opportunities for professionals stagnated. In 2002, about 12% of Mexico’s labour force resided in the US, and 30% of Mexicans with PhDs. Additionally, 79% of all science
students that the Mexican government had funded to study in the USA (CONACYT programs) never returned to work in Mexico (Vitela, 2002). The emigration of the best and the brightest of Mexicans to the USA is caused by the present and worsening economic crisis in Mexico. In 2004, 684,000 Mexicans with university degrees were unemployed (Instituto Nacional de Estadistica, Geografia e Informatica - INEGI).

NAFTA’s first decade (1994–2004) provided Mexico, among others, with educational opportunities for its students abroad but also resulted in brain drain. Since Mexicans become better educated, many are also sought by foreign companies. Australia, for example, is in such a need of certain professionals (like accountants and nurses), that it offers to “sponsor” Mexican professionals for one year, paying their expenses, expecting that during that time they will decide to remain abroad. Canadian universities send recruiters to the top private Mexican colleges to lure full-tuition paying students to Canada’s top schools. Japan, which depends on Mexico for one-third of all its organic products, sponsors fairs to attract Mexican agricultural professionals. Ireland sponsors job fairs for Mexican professionals, stating that proficiency in English is the only requirement to get a job. As result of these campaigns, thousands of Mexican professionals and graduate degree holders emigrated between 2005 and 2009, mainly to these countries, but also to France and Germany. There are worries that this “continuing emigration of intellectual capital, threatens Mexico’s prospects for economic development” (Nevaer, 2007).

The number of Mexican immigrants leaving college campuses increases, including the alumni of prestigious Monterrey Institute of Technology, known as “Mexico’s MIT”. The press claims that well-educated immigrants exile themselves from a country that has failed to lower the income and opportunity gap between it and its wealthy northern neighbour, or provide basic security for its population (Corchado, 2008). According to the International Organization for Migration, which studied the exodus of educated Mexicans to the United States, an estimated 14,000 of the 19,000 Mexicans with doctorates live in the US, many in north Texas. The number of Mexicans making leaving for the United States recently doubled in 2005 - from 275,000 emigrating annually ten years ago, to an estimated 500,000 a year nowadays - and this trend continues. Nearly half of them are specialists or professionals, who immigrate legally through special work visas. The Mexican government makes efforts to strengthening ties with Mexican expatriates, as part of the Mexicans Abroad Program, and the new Red de Talentos (Network of Talents), which targets Mexican entrepreneurs. The idea is to encourage investment in Mexico to create jobs there, and maybe to bring some of them back. But there are also mental barriers, difficult to surmount. A good exemplification of the
Growing unwillingness and rising difficulties with making the decision to return among migrants who have successfully spent a long time abroad can be found in the words of the Mexican potential expat in the US, who first “believed that if only there were a true democracy in Mexico, if only there were a more open economy, if only Mexico were more closely linked to the United States through a free trade agreement, if only there were more jobs and no peso crises - then Mexican workers would stay home to raise their families and build their country rather than making the journey to the US”. But now, when many of these expectations have become a reality, the old “if onlys” have been replaced by new ones: “If only jobs in Mexico paid better, if only free trade brought more benefits, if only the political parties weren’t always fighting, if only there weren’t so many drug killings. And if only there wasn’t such a demand in the United States for young, ambitious students like them” (Corchado, 2008).

**Nicaragua**

The concept of brain drain has appeared since the decade of the 70’s, when the social and political instability blew up through LA region, whether because of dictatorship regimes or revolutionary movements gets in power. Since then, the immigration of skilled people from Nicaragua has increased, mainly in the search of better work opportunities and higher standards of life. (FIDEG, 2008). In many Latin American countries, the market structure does not offer enough opportunities in order to employ skilled people who offer professional services each year. In the case of Nicaragua, the number of people with higher education (university level) is lower than 10%. Paradoxically, the employment rate for them is also low, in this way, an important percentage of these people do not find a suitable job or simply does work in areas outside their field of specialization, where remuneration is often lower, and where also the activities performed do not math their profile. (Martinez, J., 2005).

Two main reasons lay behind this reality, depressing for the majority of young professionals in Nicaragua. The first one deals with education quality, and is explained by the proliferation of private universities that begun early in the 90’s, in the frame of an inefficient privatization model that made higher education a big business in this country, offering a diversity of courses that do not meet the market standards. This also happen with scholars graduated abroad, because once they go back home, they are overqualified for the local context and therefore is very difficult for them to find a suitable job. Coming to the second one, and probably the most important, political willingness deserves special attention, because government structures set up to guarantee the competitiveness of higher education, are more
committed with the interest of the government in turn than with education quality and the future of the country. Furthermore, the rules of the game in the labour market are defined by circles of power around public servants, where education does not matter. Once a new government come into power, fire the previous employees along the public administration and hire friends or relatives that being in front of public entities, find skilled people a potential threat and try to push them outside the public network.

The situation described above along with the lack of development of the private sector, close the doors for skilled people in Nicaragua, that having not choice, leave behind the hopefulness reality of the country and travel somewhere else in order to do what they cannot do at home. This phenomenon unfortunately decimate the future of the country, because only skilled people can change things, which currently works in favour of those in power, but against the majority of Nicaragua’s inhabitants.

According to Özden, C. and Schiff, M. (2006), the main destinations for Nicaraguan emigrants, whether skilled or unqualified, use to be the United Stated of America and Canada. This trend was the same during the 80’s and 90’s, in the first decade due to the uncertainty caused by the US-backed counter revolutionary war and in the second one due to the IMF-backed structural adjustment program that led unemployed thousands of professional workers in the whole country. Nonetheless, emigration dynamics has changed in the last 20 years, because the range of destinations has been enlarged to the European Union and the Central American region. In case of Europe, the main destinations include Spain, Italy, France, Germany, Norway, Sweden and the United Kingdom. Most of the skilled people travel to these countries in order to work. However, there are an important number of young professionals who travel in the frame of postgraduate programmes, but once they finish and realize that the situation in Nicaragua is still the same or get worse, they decide to stay abroad. With regards to the Central American region, the main destination is Costa Rica; in this country live and work more than one million of Nicaraguans. Here is important to point out that most of the emigrants are unqualified people who work in construction, agriculture and related activities.

A research carried out by Özden and Schiff in 2006 revealed that nearly 30% of skilled people from Nicaragua lives and works abroad (Özden and Schiff 2006). The UNDP (2009) on the other hand, indicates that Nicaraguans living abroad represent up to 13% of the country’s population, which currently is near six millions. In this study Nicaragua also appears with the lowest human development index in Central America, and the second lowest in Latin America after Haiti (quoted in PNB, 2009). It is estimated that between 1990 and
2005, more than 800,000 Nicaraguans left the country and 400,000 more could leave the country by the end of 2010. Local projections put these figures even higher, in particular because the cooperation and development aid coming to the country has been halted since alleged elections fraud in 2008. This situation, mingled with the global recession in 2007 made things even worse (United Nation Development Program, 2009).

**Asia**

Of the three continents analyzed here in terms of brain drain/gain, Asia is most successful in gaining from the talents of those who once emigrated. Indian, Chinese, and Israeli immigrants to the United States, for example, have been crucial to the formation of manufacturing and information technology hubs in their home countries. Through return or diaspora action, they have served as intermediaries, commercial ambassadors, role models, mentors, international partners, and business investors upon their return (Saxenian 2006). More and more Asians from bigger countries come back home after having obtained education and experience abroad. The outflow of Asian students may be also in reverse. In 1998–1999, over 10% of all international students enrolled in US higher education were from China, and 8% were from India. At doctoral level, 80–90% of these students were enrolled in science and engineering faculties. In 1995, a survey on the proportion of foreign PhD graduates in science and technology who remain abroad showed that 79% of 1990–1991 doctoral recipients from India, and 88% of them from China were working in the United States. This numbers nowadays may not be in increasing trend as higher education sectors in Asia develops rapidly and offers continuously growing quality of education. China has recently launched a project to develop 100 universities into world-class institutions that will not only provide higher education training, but also academic employment and research opportunities, and which will also attract foreign students.

**The Philippines**

Three decades ago, President Ferdinand Marcos encouraged Filipinos to find jobs in other countries; his idea was to pull foreign currency to the country and to reduce the problems of a fast-growing population. During the mid-1980s this concept met a strong demand for semiskilled and skilled Filipino workers in the Middle East, Asia, and Western Europe, caused by major changes in the global economy. Gradually, the overseas Filipino workers have become a pillar of the country’s economy. Nine million Filipinos - 10% of the population - work abroad and remit. Every day more than 3,100 leave the country. In 2005,
according to the World Bank’s *Global Economic Prospects* report, Filipino expatriates sent home USD$11.6 billion - equal to about 12% of the Philippines’ GDP.

The World Health Report 2006 states that the government of the Philippines has taken measures to turn remittances into an effective tool for national development by encouraging migrants to send remittances via official channels. A survey of Filipino households shows that the remittances they receive reduce child labour lower and increase child schooling, and causes more hours to be worked in self-employment, and a higher rate of people setting up enterprises.

There are two types of Filipino international workers. The first are free movers, called *balikbayan* (a term from the Tagalog language, where *balik* means “to return” and *bayan* means “nation”), who have settled abroad, regularly send money, and periodically return on vacation. The second kind are temporary overseas contract workers (OCWs), sent abroad with the help of the state. In 2008, nearly 1.4 million Filipinos with employment contracts issued by the Philippine government left the country to work in more than 190 destinations (Chappell, and Glennie, 2009).

The Philippines are widely recognized as a country with one of the most effective government bureaucracies in charge of managing migration. The Philippine Overseas Workers Welfare Administration (OWWA) provides advice, insurance services, and loans to Filipinos working overseas. The core services of OWWA include a repatriation programme, health and life insurance provision, and assistance in solving work-related disputes and fraud. It also provides training for migrants and scholarship grants for attending college degree courses to their deserving and talented children. Prospective migrants can receive one-year technical and six-month vocational training in the skills required for overseas jobs. Obligatory predeparture orientation seminars help future migrants to build necessary skills and to familiarize themselves with the culture and practices of their prospective host countries (Chappell and Glennie, 2009). The country has also regulated the market of recruitment agencies, which must meet several requirements, for example “if the foreign employer fails to comply with the contract or violates any of its provisions; the worker can, in principle, file redress against the Philippine recruitment agency”. This regulation essentially turns agencies into coemployers, thus securing migrants’ rights. Moreover, the government ensures that workers who are not properly documented cannot depart to their overseas job sites, those failing that are stopped at “assistance centres” at international airports and other exit points (Agunias, 2009).
The bulk of Filipinos work as construction workers, housekeepers, seamen, drivers, dancers, and entertainers of various kinds, but the number of highly educated professionals getting skilled jobs abroad arises as well. Nevertheless, although close to half of the workers leaving the Philippines have tertiary education, brain waste is visible, especially in the health sector, where many doctors work abroad as nurses, an approach which is more lucrative than remaining in their hospital jobs in the Philippines. Wages are low and both doctors and nurses see domestic hospitals only as stepping-stones to higher paying jobs overseas. As a result of this, in the last five years more than 200 hospitals have been closed in the Philippines because of personnel shortages. The Filipino government considers skilled labourers to be an export product and thus “willingly creates surpluses of certain categories of the highly skilled mainly in medical sector” (Castles and Delgado Wise 2008).

Even though the Philippines is the world’s number one provider of nurses, there are still about six times as many nurses per capita in the Philippines than in other countries of the region, for example in the much richer Thailand and Malaysia, from which far fewer nurses depart. Paradoxically, there are more of them even than in the United Kingdom or Austria, because many young people attracted to this profession by the opportunity of migration, do not leave actually the Philippines in the end (Clemens, 2009). Also, the overall tertiary enrolment has been increasing, and roughly equals that of Hong Kong (World Bank 2008). The shift towards private education has resulted, on one hand, from shortages in the funding of public institutions and a parallel decrease in the quality of public education, and on the other hand from the “green light” allowing establishment of private higher educational institutions.

**India**

India experienced for decades the loss of the cream of the country’s management and engineering talents. The UN Development Programme report of 2001 estimated that 100,000 Indian professionals left the country every year to take up jobs in the United States (UNDP, 2001). What is particularly striking is the rapid tenfold growth of H1-B visa holders coming from India to the US in the 1989–99 period. The increased stock of Indian H1-B visa holders is particularly spectacular in the ICT sector. At the end of the 1990s, the USA contained around 30% of the Indian software labour force. Many of these workers had been educated in Indian institutions, subsidized with public money, but then drained to the US due to lack of suitable opportunities and working conditions at home. In 2000, while more than 45,000 highly qualified Indians depart India each year, it happened that some 1,500 returned from
the United States. There were numerous media communications describing enthusiastically successful returns of Indian entrepreneurs from the United States, who established subsidiaries or even entire companies in India, but the statistics revealed that only a small portion of the skilled migrants actually returned at the very beginning of twenty-first century. However, majority of the Indian diaspora maintained remote links, becoming drivers of knowledge and capital flows to India. The Indian government has contributed to the emergence of these links through legislative and tax rules that encourage remittances and investment from Indians residing abroad.

Only recently does the brain-drain trend seem to have undergone a significant reverse. Again there is anecdotal evidence that Indian professionals are returning to their home country in increasing numbers, with the plan of taking advantage of the new growth and employment opportunities. Some of the world’s biggest companies, such as Google, Microsoft, and Yahoo! are setting up production and offices in India. “You name the company and you have it in Gurgaon” - the dwellers of this modern district of New Delhi used to say. The number of multinational companies coming to India is also increasing in the cities of Bangalore and Hyderabad, which have emerged as India’s leading “tech cities”. The economic boom in India has encouraged the growth of domestic industries and foreign investments. Good salaries and compensation packages are playing a major role in bringing the professionals back to India. Moreover, the salary which can be earned in India, which is now comparable to that earned abroad, provides a much better standard of living. Companies offer the returnees very good remuneration for their foreign experience of working internationally. Indian companies are willing today to pay global salaries to talented young graduates, seeing in this a way to compete effectively in the world market and “keep the brains” in the country or bring the expatriates back. Personal reasons - such as the education of children in India, where schooling is considered to be better, and bringing them up in proximity to their culture and grandparents back home - also play a role in making return decisions. Reverse brain drain is visible not only in Indians returning to their home country; many foreigners are settling down there, looking for greater professional challenges and wealth.

The most prominent sector in Indian industry - which has been and continues to attract expatriates home - is the IT sector. A similar trend is being witnessed in sectors of business process outsourcing (BPO), and knowledge process outsourcing (KPO). These skilled, trans-nationally active specialists have beneficial impact on various sectors of the economy, on the social structure and infrastructure, and on forging and solidifying cooperation between India
and the United States (Chacko, 2007). Indian science and technology potential is growing rapidly. The demand for research scientists has also grown in the last few years, especially in the pharmaceutics, biotechnology, and engineering sectors. Indians returning home from the Middle East and from countries like Malaysia and Singapore boost their careers in research labs and companies of those sectors. The health care system in India was for many years losing its resources. It is estimated that there are at least 60,000 doctors of Indian origin in the UK, which amounts to around 12% of the total stock of doctors in India, and 30% of registered doctors in the UK. Survey evidence suggests that recent rises in return migration by Indian physicians are attributable to the rise of the corporate health care industry in that country, rather than to any particular policy initiative (Haour-Knipe and Davies 2008).

Apart from South-North (developing to developed countries) brain drain, receiving countries have also noted outflow of their skilled personnel. The USA, a major global player in the worldwide battle for talents, is experiencing reversed brain drain, which is not large, but which is beginning to attract more and more concern. In the case of New Zealand, despite the relatively high numbers of outgoing professionals to Australia, the state’s immigration policy gives preference to professionals, and the high inflow of skilled immigrants from Iran, the Middle East, the Philippines, and Malaysia makes New Zealand a net “brain gainer”. The EU still loses in the worldwide battle for brains with the US, and witnesses the outflow of specialists and academics to places all over the developed world, existing together with intra-European skilled migrations - mainly in an East-West direction.

**The USA**

The United States is the main pole of attraction for foreign skilled workers; 40% of its foreign-born adult population have tertiary level education. Since the early 1990s, some 900,000 highly skilled professionals - mainly IT workers - from India, China, Russia, and a few OECD countries (including Canada, the UK, and Germany) have migrated to the United States under the H-1B temporary visa programme. The United States also takes in 32% of all foreign students studying in the OECD countries. Higher education is an important channel for US firms recruiting highly skilled migrants; some 25% of H-1B visa holders in 1999 were previously students enrolled at US universities.

The US 1990 Census revealed that there were more than 2.5 million highly educated immigrants from developing countries residing in the United States. After two decades this number has tripled. One striking feature of the US migration data is that immigration flows of
individuals with no more than a primary education are quite small (about 500,000 individuals out of a total of 7 million immigrants in 2005). Foreign-born individuals with little or no education, however, may be undercounted by the census if they are in the country illegally or do not speak English. Migrants to the United States tend to be better educated than the average person in their home country, and the proportion of very highly educated people who migrate is particularly high, excluding migration from Central America which is dominated by persons with a secondary education, rather than those with a university degrees. The biggest migratory flows from Africa to the United States are from Egypt, Ghana, and South Africa, with more than 60% of immigrants having a tertiary education from these three countries. Migration of Africans with only a primary education almost does not exist, while Mexico, for example, has a large majority of migrants (2.0 million of 2.7 million) with only secondary or lower education (less than 13% have a tertiary education), as was explained earlier in this study.

Since the Immigration Act of 1990, followed by the American Competitiveness and Work Force Improvement Act of 1998, the USA has given priority to highly skilled immigrants through a system of quotas favouring candidates with academic degrees and/or specific professional skills. In the latter category, the annual number of visas issued for highly skilled professionals (H-1B visas) increased from 48,000 in 1989 to 116,000 in 1999 (Lowell, 2000). Currently the quota for H-1B visas is set at around 195,000 per year. H1-B visas admit professional and specialized workers for up to six years on the basis of the employer’s declaration that US workers are not available at the prevailing wage. This period can be extended: “if an H1-B visa holder can find an employer to sponsor their certification, he or she can eventually become an immigrant” (Baldwin and Winters, 2004)

The USA has become the target of critics because of its success in attracting health professionals, which public opinion and authors sometimes see as aggressive recruitment, depriving poor countries of their scarce human medical resources. Health care needs in North America will grow, with predictions of massive shortages of up to 200,000 physicians and 800,000 nurses by 2020, driven by the escalating demands of an aging society, new technologies, management of chronic diseases, changing family structures, and consumer and provider preferences. These forecasts prompt major American organizations to endorse targeted increases in the size of US medical schools and the number of residency training slots. If the USA becomes self-sufficient in health care, there is hope for reduced drainage of the still limited human resources of poorer societies, but if the job market decides that it is
less costly to get skilled force from abroad, then the brain drain of medics will continue increasing.

The USA is experiencing reversed brain drain. The first symptoms emerged in case of Taiwanese graduates, who arrived as students to the USA in the 1960 and 1970s, but who in the 1980s returned to promising Taiwanese economy. Educated in the USA, they subsequently contributed to developing Taiwanese ICT sector. Nowadays, Indian and Chinese migrants, who constitute large cohorts in absolute numbers, look back with sentiment to their homelands, eager to return as opportunities continue to blossom there. Another striking issue is that there is evidence, derived from certain cases, that a foreign scientist may earn more than a US-born scientist. A relatively small sample of members of the US National Academy of Sciences and National Academy of Engineering, showed that foreign-born scientists have tended to earn significantly more on average than native ones (Guellec and Cervantes, 2001). Are they more talented, more hard working, better screened and/or offered better remunerations to keep the brightest, ask the authors of the study. This reversed brain drain is also the reason why the USA still maintains barriers to temporary return. Skilled workers pursuing naturalization in the United States, for example, are required to remain continuously present in the US for years while their case is considered. The Return of Talent Act, introduced in the US Senate in 2007, would have created exceptions to that restriction for skilled workers wishing to assist in reconstruction following conflict or natural disasters in their home countries - but unfortunately this proposal never become law (Clemens, 2009)

The United States is not the only magnet. Canada also attracts talent and, despite its own modest loss of skilled migrants to the US, is in fact a net importer of human capital. Skilled migration to Germany and France has been lower in recent history, but these countries have now implemented as strong policies to attract foreign students, researchers, and IT workers, as the US, Australia, and Japan. In 2000, Germany launched a kind of “green card” scheme to recruit 20,000 foreign IT specialists, and by the end of 2001 had recruited half that number, mainly from eastern Europe. In addition, dynamic Asian economies like Singapore are trying to plug shortages in IT workers through immigration from neighbouring Malaysia or China.

The European Union
The intra-European temporary mobility of highly-skilled personnel is a process encouraged within EU mobility programmes. Some programmes also facilitate outgoing mobility to third countries, specifically to developed ones, with an obligatory transfer of
knowledge and reintegration stage. EU policy includes also supporting temporary academic and professional mobility to developing countries, with the aim of development cooperation. Apart from these directed and managed flows, European countries lose their highly-skilled workers, although emigration varies across Europe. The UK and Ireland rank highest in the total number of migrants sent abroad. The UK also topped European countries in the number of professionals migrating to the US annually (nearly 3,000), followed by Germany (about 1,500), and France (about 700 migrants). Smaller EU countries, such as Sweden, the Netherlands, and Ireland in particular, are seeking to produce more graduates with international experience suitable for work abroad, in order to cope with their growing international and off-shore businesses activities. The overall volume of European migration to the US has been more or less steady over the last few years. The number of immigrants to the US from Europe in 1994, 1995, and 1996 totalled 62,658, 44,870 and 46,776 respectively. In 1996, 7,638 EU professionals were granted permanent US visas. These included executives and managers (81%), followed by architects, engineers, mapping scientists, mathematicians, computer scientists, natural scientists, doctors, nurses, and pre- and post-secondary teachers. The US is also a significant magnet for academic emigrants. About 50% of all Europeans who complete a PhD there stay on for longer periods afterwards, and many of them stay permanently. This may also be reflected in the National Science Foundation data on European doctorate holders. The data show that in 1995 there were around 17,000 Europeans who remained in the US after having completed their PhD. Of these, around 11,000 became naturalized citizens, and about 3,900 of them became permanent residents. Graduates from the UK have the highest stay rate in the US, whereas most German graduates return home (approx. 75%). Nevertheless, in 1996 the German Research Society sponsored 1,028 German fellows to go abroad, 641 of whom (approximately 60%) chose the USA as a destination. Despite the fact that the US is the main destination of European migrants, they tend to be attracted by just a few places there. California, New York state, and Massachusetts remain the favoured destinations for European scientists and engineers, and for other highly skilled personnel (US INS sources 1993).

Europe still loses in the worldwide battle for brains with the US. European research institutes may perform better in some fields than US-based one, but they lack the “magnet power” that can transform them into pivotal points in their fields. The US seems to have a lot of such centres, offering flexible and open career structures. These pull factors are strengthened by the strong entrepreneurial culture and high living standards. The Italian scientist Riardo Giacconi, a Nobel Laureate in Physics, summed up what might be the most
important factor behind attractiveness of US science, when he said: “A scientist is like a painter. Michelangelo became a great artist, because he had been given a wall to paint. My wall was given to me by the United States” (Raghunath, 2005).

In case of developing countries, it might be argued that the remittances can balance the lost of skilled workers. In Europe, however, richer and providing better education and overall personal development opportunities, this is not usually the case, and the negative effects of the migration of highly-skilled personnel is not outweighed by any funds they being sent back, especially when it is the so-called la crème de la crème, or “star scientists” who leave - people whose talents can have many spillover benefits for their host countries, like in particular many of the US Nobel prizes winners who originated from Europe.

At the same time the EU is trying to attract skilled foreigners. The EU Blue card seeks to attract highly-skilled non EU-nationals by establishing a fast-track admission procedure to provide a secure legal status and a set of guaranteed rights to smooth the process of integration. The provisions include family reunification, residence permit, equal social security treatment, expectations of equal pay, and free movement within the Schengen area. (Nurse and Jones, 2009 )

**Final remarks**

It is estimated that some 180 million people - 3% of the world’s population - are living in countries in which they were not born. These numbers are expected to increase rapidly in the following decades. That is why in the last few years, the issues of brain drain and brain gain have attracted increasing attention. According to the new approach, migration of a skilled worker may also have some positive feedback for certain sending countries. The mobility of the skilled can also be considered as a positive phenomenon from the point of view of global innovation. The question is to create the proper research and professional practice conditions for those who have the capacity to push the economy forward, regardless of which country they are resident in.

It has been shown that penalising workers for leaving the country has limited efficacy, though incentives for staying may be of help. The best incentives would be to improve working and living conditions at home. Some countries, having no prospects of achieving this, enforce return by requiring professionals to comply with government or private sector service and residency requirements after periods of foreign study. One important issue is who will returns? Who is willing to respond to the home country’s incentives? A partial answer to these questions can be found in literature on the assimilation of foreigners. The findings on
how well immigrants assimilate in destination countries suggest that returnees are negatively selected. Similarly, in the common perception, someone who returns must have not assimilated well or have succeeded abroad. In the case of lack of return, one option to use émigrés’ intellectual, financial, and experience capital is the activity of the diaspora. The findings suggest that the most talented compatriots residing abroad are likely to make their contributions - if any - to the economy of the country of origin as members of the diaspora, rather than on their return. “The diaspora channel denotes the impact of emigrants on the home economy from afar. In addition to being a source of trade, investment, remittances, and knowledge, a successful diaspora can play a critical role in reducing barriers to international business through its role as ‘reputational intermediary’ and thus help poor countries integrate into global production chains and international trade” (Kapur, McHale, 2005). When there is a distinct lack of opportunities to put one’s skills into practice in the home country, people stay abroad, having at home only the alternative perspective of staying idle for months despite their expertise and enthusiasm. Personal factors, such as the desire to be reunited with family and friends, or a need to return to their previous roles and positions, also play a role. A quite different category in the returnee spectrum is that of those who were sent abroad by their employers, and returned to their stable jobs.

The challenge of redirecting the loss of skilled workers into “brain circulation” is to find ways of creating opportunities at home. Potential nuclei for development could be established by focusing on research and development that is based on national priorities and niches of opportunity. The requirements necessary to achieve this include:

1. implementing educational strategies that support and nurture these nuclei through both targeted national programmes and training abroad;
2. investing in infrastructure for research and development and creating conditions that foster the growth of public-sector and private-sector demand for research results, technological development and innovation;
3. building an enlightened leadership and enabling national scientific community with opportunities for coherent development of scientific and technological capacity.

Scientists and highly skilled professionals who have emigrated are recoverable assets that can play a part in developing opportunities at home. However, getting them back requires the opening of diverse and creative conduits. One of these could be the strategic channelling of remittances to generate investment in research and development, to be used together with matching government funds and/or fiscal benefits as incentives. Emigrants’ capacities could be engaged in innovative graduate education opportunities at home and in technology transfer
in areas of national priorities for research and development. Ultimately, involving individuals who are living abroad in creating opportunities at home favours both the retention and repatriation of national talent. The above strategies should be complemented with the participation of the scientific community in planning and establishing policy for national development.

In the near future, when, as many researchers foresee, global mobility is to increase, the interest in these issues will increase, and more research on this topic will appear. Improving our understanding of recent trends in the international mobility of highly skilled human resources requires further research and studies based on new and improved information sources. On one hand, the production and the use of information sources and access to the outcomes of censuses and entry dates from more countries is needed. Better diagnosis of the current state and dimensions and results of skilled flow will be possible if competent public institutions, from both sending and receiving countries, undertake a more systematic production of statistics. On the other hand, the findings of statistical data should be complemented by qualitative investigations. An example of such material which is complementary to academic mobility statistics is the book developed by the project team, “The Best and Brightest Come Back Home: The Impact of the Erasmus Mundus Programme on its Non-European Master’s Graduates”, which looks in-depth into return and brain gain cases.

References

9. Corchado Alfredo, 2008, Mexico sees 'brain drain' as the brightest go north , The Dallas Morning News,
25. Nurse Keith and Jones Jessica, 2009, “Brain Drain and Caribbean-EU Labour Mobility” (paper commissioned from Shridath Ramphal Centre for International Trade Law, Policy and Services, by Observatorio de las Relaciones Unión Europea - América Latina (OBREAL) for the BRIDGE S LAC project
29. Özden Çağlar, 2005 “Brain Drain In Latin America”, Report from Expert Group Meeting On International Migration And Development In Latin America And The Caribbean; Population Division, Department of Economic and Social Affairs, UN,
33. Sandip Roy, 2009, “Brain Drain In Reverse, Back To India”, New America Media