Skilled Labour Migration from Developing Countries: Study on Argentina and Uruguay

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INTERNATIONAL MIGRATION PROGRAMME

INTERNATIONAL LABOUR OFFICE GENEVA
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Foreword

This report forms part of a series of studies conducted by the International Labour Office under the DFID-sponsored project on “Skilled labour migration (the ‘brain drain’) from developing countries: Analysis of impact and policy issues.”

International migration of skilled persons has assumed increased importance in recent years reflecting the impact of globalisation, revival of growth in the world economy and the explosive growth in the information and communications technology (ICT). A number of developed countries have liberalized their policies for the admission of highly skilled professionals.

The problem lies in that this demand is largely met by developing countries, triggering an exodus of their skilled personnel. While some amount of mobility is obviously necessary if developing countries are to integrate into the global economy, a large outflow of skilled persons poses the threat of a ‘brain drain’, which can adversely impact growth and development. The recent UK government (DFID) White Paper on International Development, “Eliminating World Poverty: Making Globalisation Work for the Poor” has rightly pointed out the need on the part of developed countries to be more sensitive to the impact on developing countries of the brain drain. It was in this context that the Department for International Development, United Kingdom, approached the ILO for carrying out research relevant to the above issues.

This study by Ms. Adela Pellegrino, reviews the historical background of migration patterns from the two countries, and how skilled migration was linked to socio-economic and political developments in the home countries. Economic crises and high levels of unemployment throughout the last decade have developed new waves of emigration, raising ‘brain drain’ concerns in both countries. Throughout 2000, there has been a resurgence of the emigration debate in Argentina and Uruguay with the “brain drain” as the centre of discussion and media coverage. The author argues that the creation of an environment that enables potential migrants to stay in their country of origin and encourages return of emigrants offers the best prospect, but that it is conditional on achievement of sustained economic growth.

ILO gratefully acknowledges the financial support of the Department for International Development, United Kingdom, for undertaking this research programme.

Mr. Piyasiri Wickramasekara, Senior Migration Specialist, International Migration Programme, acted as the ILO Project Coordinator and technically backstopped all the studies. ILO is most grateful to Professor Adela Pellegrino for her valuable contribution.

Geneva, September 2002

Manolo I. Abella
Chief
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Executive Summary

During the 20th century, Argentina and Uruguay were among South American countries where the extension of elementary and higher education developed at an early stage. Since the 1960's, both countries experienced growing emigration with highly educated people constituting an important share.

In both countries the economic crisis of the 1980's (the "debt crisis") and economic reforms led to big changes in education and research investment. At the same time, industrial development suffered a significant draw back. In recent years economic crisis and unemployment have reached unprecedented levels in the history of both countries. With an important emphasis in higher education, these countries continue to produce good professionals and technicians, who are well received in developed countries as well as in developing countries which suffer from a shortage of skilled workers. Selective immigration policies that have become common practice of rich countries, attract young skilled people from developing countries and this combination of push and pull forces is one of the main present features of this subject.

International migration has been an important chapter in Latin American history. The Americas have been a recipient of immigrants throughout the five hundred year conquest of the territory by European colonial empires. It is since the middle of the 20th century that migration patterns from the north and south of the Rio Bravo begin to change and Latin American countries gradually experience negative migratory balances.

There was a notable increase in the emigration of Latin Americans to the United States in the mid-1960s. The US population censuses show that people born in Latin American and Caribbean countries increased from 1 million in 1960 to more than 13 million in 1997. A significant number of illegal immigrants must also be taken into consideration when computing these figures. Moreover beginning in the 1970s, migration flows diversified as Latin Americans headed for various countries in the developed world. Despite restricting the entry of immigrants from 1974, European countries continued to receive important contingents of refugees and political exiles. Another mechanism that received a boost in that period was the extension of citizenship to European and Japanese emigrants' descendants born in other regions of the world. Furthermore countries like Canada and Australia also received Latin American immigrants.

Though it continued to be a recipient of immigrants in the region, Argentina began to experience increased emigration of its own population in the 1960s. Unlike the processes of Mexican and Central American emigration, in which the destination was almost exclusively the United States, emigration originating in the Southern Cone (Argentina, Chile and Uruguay) focussed also on other regions, predominantly Europe, though also Mexico, Venezuela, Israel, Australia and Canada. Nevertheless, despite this broad geographic distribution, the US probably remains the most important destination of Argentines.

As a consequence of political repression and rising unemployment in the 1970s, the level of Argentine emigration increased enormously, incorporating a broad array of occupations and
transcending the profile that had been exclusively oriented towards professionals or skilled labourers. Even so, relative to combined emigration from other Latin American countries, emigrating Argentineans continued to be characterised by a high level of education, which also included well-known people in the field of scientific research, art and literature.

Like Argentina and southern Brazil, historically, Uruguay has been an important recipient of European immigrants when it enjoyed successful economic performance as an agro-exporter. Yet during the late 20th century, Uruguay became a net exporter of immigrants.

Emigration proved an attractive option for the middle class sectors with high education and for labourers and craftsmen with industrial experience. Uruguayan emigration had a marked demographic impact for the country's population. Between 1963 and 1985, this was estimated at 12% of the mean population in that period and 20% of the economically active population. Net rates of emigration reached their highest levels between 1972 and 1976, underscoring the impacts of the deepening political crisis and serving as a response to the arrival of military dictatorship in 1973.

By 1980, 9% of total Uruguayan professionals and technicians were living in the United States and in 11 Latin American countries. These calculations do not take into account those residing in European countries or in Australia, which would push the proportion above 12%. Estimates based on the 1990s censuses are similar.

Throughout 2000 we have witnessed the resurgence of the emigration debate in Argentina and Uruguay. Economic crisis and high levels of unemployment throughout the last decade has developed new waves of emigration. "Brain drain" arose as the centre of discussion and media coverage.

The creation of an environment that enables potential migrants to stay in their country of origin and return emigrants by way of fomenting spaces of employment is the best proposal; yet prior to this, it is necessary to achieve economic growth and lower unemployment.

Policies oriented to connect researchers and members of academic spheres with those working in the developed world are discussed. One idea is to create scientific co-operation programmes to consolidate ties between migrants and their countries of origin, through financing of travel, granting scholarships to students or other similar measures. In referring to disciplines in which there is a certain level of development in the countries of origin, this could also entail the creation of teaching programmes and research centres that would allow the integration of local resources with those from abroad, stimulating a process of networking with expatriate colleagues.

From the perspective of creative activities related to production or services, "joint-venture" agreements with local groups that would permit working under "developed" conditions and retain resources in the countries of origin, could also prove to be an attractive strategy. It is essential in such cases that technological or scientific development is rooted in the local community.
1. Introduction

During the 20th century, Argentina and Uruguay were the first South American countries to expand elementary and higher education. Average income in Argentina has been substantially higher than in the rest of the continent. Scientific and technological research and innovation accompanied industrial development since 1930; one reason why Argentina is the only Latin American nation in which people doing research in their home country have received the Nobel Prize in sciences.

Since the 1960s, both Argentina and Uruguay experienced a rise in emigration. Argentina remains a country of immigration, receiving workers from the neighbouring countries who mainly supply the unskilled job market. But there is also evidence of growing emigration to the developed countries of the North, a large proportion of which are characteristically highly educated and qualified professionals.

Despite Uruguay being a long-time recipient of European immigration, there has been a continuous wave of Uruguayan emigration to Argentina. As a consequence of the confluence of economic and political crises during the 1970s, a wave of Uruguayans left the country primarily for Argentina and Brazil but also the United States, Venezuela, Australia and various Europeans countries. As a result, around 12% of the total Uruguayan population and 20% of the economically active population are living abroad. It is estimated that Uruguayan professionals and technicians outside the country represent 12 to 14% of the stock in the country.

The "brain drain" debate has been a constant. During the 1960s and the 1970s in Argentina, a significant amount of publications and research on this subject were produced. The period of 1966 to 1983 in Argentina was one of political instability and repression by successive military governments against the opposing elite, academics and teachers. This directly affected university professors and also researchers in other public institutions. Moreover in Uruguay, the military government (1973-1985) had a strong influence in driving emigration. The phenomenon later became one related to the difficulties in maintaining and developing a research sector in such a small country.

When democratic governments recovered political power (1983 in Argentina, 1985 in Uruguay), various programmes to promote the return of emigrants highlighted the existence of a scientific community, which had flourished in exile. Many members of these communities were ready to return. The experience of some of these programmes and a limited increase in funding for research and teaching, showed that efforts to consolidate science and technology communities were not without avail.

For both countries, the economic crisis of the 1980s (the "debt crisis") and economic reforms led to large changes in education and research investment. Simultaneously, industrial development suffered a major decline. This predicament remains dominant in the region. With a solid background in higher education, these countries continue to produce highly competent professionals and technicians, who are well received in developed
countries as well as in developing countries, which suffer from a shortage of skilled workers.

In the last two decades, skilled emigration has become a structural trend in both countries. In line with this development, selective immigration policies that are common practice in wealthy countries have attracted the emigration of young skilled people from Argentina and Uruguay, creating a combination of push and pull forces which is a dominant feature of migration today.

The objective of this report is to present the current status and trends of recent decades involving skilled emigration from Argentina and Uruguay.

This study intends to present the issue within the context of Latin American migration and more specifically, migration involving South American countries. In referring to skilled migration from Argentina and Uruguay, we have included a description of the main trends, its volume and characteristics, and a brief overview of the situation in each country as far as scientific and technological developments are concerned.

Furthermore we present a summary of policies that have been implemented with the objective of facilitating the return of exiles. Particular attention is paid to policies enacted in the period immediately following the end of the military dictatorships that devastated the region from the mid-1970s to the mid-1980s.

As an appendix, we have included some comments on data sources available in Latin America for the study of migration, their limitations, the definitions they employ and some models or types of skilled migration that can be identified in the region.

2. The Context of Migration in Latin America

International migration is an important chapter in Latin American history. The Americas have been a recipient of immigrants throughout the five hundred year conquest of the territory by European colonial empires. It is since the middle of the 20th century that migration patterns from the north and south of the Rio Bravo (also known as the Rio Grande) changed. Latin American countries gradually experienced negative migratory balances, both in extra-regional migrations (mostly to the United States) and in regional flows, chiefly between neighbouring countries.

Until the 1960s, international migration movements were almost exclusively across borders in close proximity. This type of migration flowed mainly toward agricultural areas close to national borders, stimulated by the rural workforce shortages resulting from the flow of the local population toward cities. Though the general profile of intra-regional migration is dominated by rural workers with little education or workers in low-skilled occupations, the highly educated elite has always tended to migrate given the political instability that has characterised the region for much of its history.
Argentina, Venezuela, Costa Rica and Mexico were the recipients of migration flows involving shared border areas. Though it is of the greatest quantitative volume in the region, migration between Mexico and the United States had until the 1970s a profile comparable to the border area population movements in other parts of the Americas.

To a great extent, the orientation and profile of international migration in Latin America in that period can be considered consequences of the global processes of demographic and economic growth occurring at the time.

Around the middle of the 20th century, the region registered the highest demographic growth rates in the world and the per capita gross domestic product (GDP) doubled during 1950-1978. However, as a region Latin America attracted much international attention due to disparities in the distribution of income and unequal access to the fruits of economic growth.

Demographic growth and expansion of economic activities in the cities were accompanied by massive mobilisation of rural populations to urban centres, marking an unprecedented process of social change. Latin American cities grew at an immense pace, placing them among the largest metropolitan centres in the world. Internal population movement toward the cities, or urbanisation, was in some cases complemented by migration from bordering countries to agricultural work, though this was largely limited to seasonal labour.

The modernisation of Latin American countries and economic growth around the middle of the century enabled an expansion of educational systems. Though all the countries did not start with the same levels of educational development and advances occurred at different paces and intensities, progress in this area was unmistakable.

In the 1960s, Latin America's economic growth began to show signs of fatigue. The industrialisation substitution model came under fire and economic policies oriented toward protecting industrial development were abandoned, initiating a new stage of free exchange and an opening toward international trade.

Crisis gripped the region, though its impacts were diverse: in the 1970s, the countries to the south of the continent showed symptoms of the crisis, while others (Brazil, Colombia, Dominican Republic, Ecuador, Guatemala and Paraguay) maintained levels of economic growth that surpassed their previous achievements.

In the 1980s, the "debt crisis" became widespread, triggering a decline in per capita GDP for many countries, eroding living standards for the middle-income sectors and increasing poverty and indigence rates. The unequal distribution of income worsened in countries like Argentina and Uruguay, which were traditionally hailed in the region for their high level of social homogeneity.

1 The percentage of people living in poverty rose from 41% in 1980, to 44% in 1989. At the end of that decade there were some 183 million poor in the region, located mostly in urban centres. In the past decade the number of people living in poverty rose beyond predictions. These estimates were based on criteria for poverty measurement used by ECLAC. A measurement of poverty through procedures adjusted for each country would provide results, in some cases, of notably higher poverty rates.
The effects of the economic crisis on migration movements were inconsistent throughout
Latin American countries. Generally, the 1970s was a period of rapid growth in emigration
and the widespread crisis of the 1980s paralysed intra-regional migration. Migration flows
to Venezuela and Argentina (the principal recipient countries in South America) stagnated,
while simultaneously emigration flows to the United States and other developed countries
reached a significant volume (table 1 in statistical annexure).

There was a notable increase in Latin American emigration to the United States in the mid-
1960s, whilst traditional migration from Europe to the United States began to lose
significance. The US economy, in full expansion mode, once more needed the contribution
that migration had historically made to its labour force. On the other hand, the liberalisation
implied by the 1965 Immigration Act eliminated entry obstacles for the contingents of
immigration originating from various parts of Europe.²

The US population censuses show that people born in Latin American and Caribbean
countries increased from 1 million in 1960 to more than 13 million in 1997³. Moreover the
significant number of illegal immigrants must be taken into consideration when computing
these figures.

Furthermore beginning in the 1970s, migration flows diversified as Latin Americans headed
for various countries in the developed world. Despite restricting the entry of immigrants
from 1974, European countries continued to receive large amounts of refugees and political
exiles. In time these immigrant cores established networks that enabled the continuation of
the flows. Another mechanism that received a boost in that period was the extension of
citizenship to European emigrants' descendants: European countries that were the source of
immigration to the Americas in the 19th century and first half of the 20th, now receive
immigrants who benefit from the extension of their ancestors' nationalities. Similarly, the
descendants of Japanese migrants to Brazil and Peru in the early part of the 20th century
have the opportunity to emigrate to Japan under recent programmes, which are encouraging
this. Other countries such as Canada and Australia continue to receive Latin Americans. The
novel characteristic of the 1970s dynamic was the array of options that surfaced as potential
destinations for migrants.

From the perspective of education and training, as well as occupational insertion, the profile
of Latin American migrants varies according to the recipient countries and the type of
migration flows involved. Tables 2 and 3 (statistical annexure) present data on the
professionals and technicians recorded by censuses in Latin American countries and in the
United States. As had occurred with combined intra-regional migration, it is evident that the
volume of professionals and technicians involved grew ever so slightly or even decreased
between the 1980 and 1990 censuses, a time when economic crisis prevailed throughout the

² In the United States, Latin American immigration was outside the quota systems, which had been prevalent
since the 1924 Immigration Act. Granting immigrant visas to people coming from the Americas was based on a
series of qualitative requisites, outlined in the law of 1917: basically, health conditions and moral and political
background. Enacted amid the escalating tensions of the Cold War and McCarthyism, the law of 1952 also
incorporated political-ideological restrictions, such as the ban on granting visas to communists.
³ The information corresponding to 1997 is taken from the Census Bureau, Current Population Survey (1999).
region. In relation to the United States, the presence of professionals and technicians increased three-fold in the period studied. Table 3 reflects an estimate of the impact of migrating professionals and technicians on the total economically active population (EAP) in other countries of the region and in the United States. It also includes the percentage they represent of the EAP in their countries of origin\(^4\) to establish some comparisons and to evaluate the selectivity of migration flows.

From this overview one can see that in various cases, such as that of Mexico, for example, the weight of professionals and technicians among the emigrant population is less than in the workforce that remains in the country of origin. In others, the situation is reversed, showing a notable selectivity toward the more skilled occupations among migrants.

As far as migration between the countries of Latin America, throughout the second half of the century, two parallel phenomena were observed: the countries receiving migrants in the region incorporated workers into the agricultural sector or into unskilled sectors of the urban labour market. However, there was also the presence of migrants from the "professional and technical" category that responded to the additional demands of these workers, and in cases in which the local supply was insufficient (for example, Venezuela in the 1960s and 1970s). The employees of transnational companies or international institutions have also represented an important presence of professionals and technicians.

The educational profile and occupations of the immigrants to Europe or other regions of the world (Australia, for example) are not available. In the case of the United States, the only developed country for which we have information about the characteristics of Latin American migration flows, the region's immigrants, on average, have limited education and tend to be inserted in occupational sectors that require lower skill levels.

However, the situation is heterogeneous depending on the countries of origin: there are cases in which the skill-level of the immigrants, measured in the number of years of education, is higher than the average of the country of origin. Emigrants from Central America and Mexico have a low average educational level, but if the number of skilled emigrants is taken into account, it represents a high portion of the local skilled population. In the case of other countries, especially those of the English-speaking Caribbean and some from South America, the ratio of people with higher education to the total surpasses the similar indicator for the native population of the United States and of the foreigners in general. Graph 1 (statistical annexure) outlines the information corresponding to the different educational levels and graph 2 (statistical annexure) shows the percentage of people with doctorate degrees with respect to the total people age 25 and over in each group. In the case of migrants from Argentina, Venezuela, and Chile, the percentage of people with doctorates surpasses the average of the foreign population living in the United States, and if Paraguay, Uruguay, Panama and Cuba, Bolivia and Peru are added, it surpasses the average corresponding to the native population of the United States. Information is not available about the people with graduate-level education or doctorates in the countries of origin that

\(^4\) Clearly this involves an estimate subject to error because, beyond the fact that estimates in many cases could not be made due to lack of information, in others it was only approximate because the categories we had to use are not homogeneous.
would have allowed an evaluation of the impact of emigration on the skill level of the labour force in the country of origin.

Argentina and Uruguay are the South American countries in which the expansion of elementary and higher education developed earliest in the 20th century. In the Argentinean case, the mean income has been substantially higher than in the rest of the continent. According to the Human Development Index, prepared by the United Nations, both Argentina and Uruguay are among the 40 countries with highest human development in the world and, alongside Chile and Costa Rica, hold the highest rankings for the Latin American region. Since the 1960s, the population of both countries has shown a tendency toward emigration, with purely selective traits in the case of Argentina, and massive traits in Uruguay, with the subsequent demographic impacts on the total population.

3. Argentina: A Country of Immigration and Emigration

Argentina is a country with a long history of migration: in addition to its status as a receptor of European immigration, it has traditionally been the destination of flows coming from the neighbouring countries of Bolivia, Paraguay, Chile and Uruguay. It had a low demographic density and had experienced the early process of demographic transition toward reduced population growth in the course of the century.

From the late 19th century to the mid-20th century, Argentina was a country of outstanding growth within Latin America, and enjoyed one of the highest per capita incomes in the world. Industrial expansion came early and proved successful. Buenos Aires turned into a sort of labour centre that attracted immigrants from the entire region. The expansion of employment in industry and other modern sectors was accompanied by slow demographic growth, which stimulated internal migration on top of immigration from abroad. European immigrants and those from neighbouring countries contributed to consolidating the urban sectors of Argentina, especially the metropolitan area of Buenos Aires.

Social welfare and economic indicators, differentiated Argentina from the rest of the region, except for Uruguay, which underwent similar social development (table 4 in statistical annexure).

The insertion of immigrants from neighbouring countries in the labour market was varied. Rural workers maintained a presence in the areas bordering Chile, Bolivia and Paraguay, while there was a considerable presence of industrial labourers and service-sector employees in the urban centres, particularly in the city of Buenos Aires. Transformed into the largest metropolis of the region, the city also attracted professionals, artists, scientists and technicians from neighbouring countries.

Though it continued to be a reception centre for migrants in the region, Argentina began to experience an increased emigration of its own population in the 1960s. Unlike the processes of Mexican and Central American emigration, in which the destination was almost exclusively the United States, emigration originating in the Southern Cone (Argentina, Chile
and Uruguay) began to focus also on other regions, mostly on European countries, though also Mexico, Venezuela, Israel, Australia and Canada.

Even taking into account this broader geographic distribution, the United States probably continues to be the most important destination of Argentine emigration. The available estimates on the emigration of Argentineans indicate that by 1970 the number of citizens living abroad did not surpass 150,000, and that a decade later there were 290,000 (Gurrieri, 1982), implying that in the course of the 1970s the volume nearly doubled. Bartocello and Lattes (1986) estimate a "stock" of emigrants for the period 1955-1984 of 609,000 as the maximum, and 499,000 as the minimum, which corresponds to 2.2% and 1.8%, respectively, of the total population in 1980. There are no recent reports that provide emigration figures, though it is widely held that a structural trend of migration has established itself in the country among the middle and middle-high income sectors with high levels of education - which tends to maintain a stock of emigrants at 2 to 3% of the country's total population.

These relatively small percentages demonstrate that the concern about emigration that was manifest in the political and academic spheres in past decades was due primarily to qualitative aspects related to the skill levels of the population that was leaving. A dominant characteristic of Argentine emigration, compared to Latin American emigration on the whole, is that it is made up of individuals with high levels of education, and includes an important presence of professionals and technicians. However, during the 1960s and 1970s, there was also a considerable presence of industrial workers.

In the 1970s, to a great extent the consequence of political repression, but also because of rising unemployment, Argentina's emigration became massive, incorporating a broader array of occupations and transcending the profile that had been exclusively oriented toward professionals or skilled labourers. Even so, in comparison with the combined emigration from other Latin American countries, the Argentineans who emigrated continued to be characterised by a high level of education and included people well known in the field of scientific research and in artistic and literary circles.

### 3.1. Skilled migration from Argentina

The emigration of skilled individuals (or "brain drain" in the terminology used in the 1960s and 1970s) was motive for concern among Argentina's academic circles. The literature on "brain drain" in the 1960s and 1970s was extensive in that country, perhaps more than in any other in Latin America. The works of Morris Horowith (1962) and Bernardo Houssay (1966) were pioneering efforts in this field. In addition there was a series of studies conducted by Enrique Oteiza (1965,1966,1967,1969,1971) on the emigration of Argentine professionals, technicians and specialised workers, and on the emigration of doctors in particular, by Sito and Stuhlman (1968) and Oszlak and Caputo (1973).

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5 It is impossible to measure the true volume of Argentine emigration to Europe as the European countries generally categorise the population according to citizenship, meaning that there is no record of those who emigrate from Argentina with the citizenship extended to them by the European nationality of their ancestors.
The training of professionals and technicians reached considerable development in Argentina, a country where the impetus behind the educational system began very early in the country's history and where the objective of making primary and secondary education universally accessible created an educational level that was much higher than the Latin American average. The universities are known for their history and success in the training of professionals, and have long attracted students from other countries of the region.

As far as development of scientific and technological research, these fields were established very early on with respect to the rest of the region. A process of institutionalisation that began in the final decades of the 19th century gave them a boost that fostered significant development in the first half of the 20th century (Albornoz and Kreimer, 1999, Myers, 1992; Oteiza, 1992), putting Argentina in a position much higher than the Latin American average of scientific and technological progress. Scientific research was initiated primarily within the sphere of public universities, and later in observatories and museums financed by the State (Myers, 1992). The greatest accumulation of knowledge took place initially in physics and in biology.

In the decade of the 1950s, after the second presidency of Juan D. Perón drew to a close in 1955, several institutions designed to foment scientific and technological development in different areas were created. The Atomic Energy Commission and the National Institute of Industrial Technology (INTI) were re-founded, and the National Institute of Agrarian Technology (INTA) created in 1956, and the National Council on Scientific and Technical Research (CONICET) was established in 1958, the organisation of the latter strongly inspired on France's CNRS (Centre National de la Recherche Scientifique).

The development of scientific research during the first half of the 20th century meant that by the 1960s Argentina reached a sort of peak. Three Nobel Prizes in science (Bernardo Houssay, in 1947; Luis Leloir in 1970, and César Milstein in 1984 - who won the prize for work at Cambridge University, though his academic training and first endeavours as a researcher occurred in Argentina) were the result of on ongoing process of knowledge accumulation and should not be considered as achievements of isolated individuals.

This situation began to suffer a series of interruptions due to the variations in the political and institutional process that took place at mid-century, and particularly as of 1966. In that year, the so-called "night of the long sticks" constituted a notorious episode that led to a rupture and an important exodus of scientists, disintegrating research groups and eliminating spaces in which the accumulation of knowledge and academic tradition had been founded. According to studies conducted by Slemenson and other contributors (1970), 1,378 people resigned from their scientific posts at the University of Buenos Aires in that period, of whom 301 emigrated to other countries, and, of those remaining, 71% belonged to the Faculty of Exact and Natural Sciences.

Beginning with that period, a dispersal of Argentine scientists and researchers occurred toward different locations in the developed world, as well as to developing countries that
had a high demand for skilled workers\textsuperscript{6}. These initial immigrants constituted the nexus that allowed the development of subsequent migrations. Political instability did not end in 1966.

On the contrary, repression against the members of the university and cultural spheres in general worsened in the mid-1970s, a period when State-sponsored violence reached unprecedented levels. Once again the dismantling of research centres and university cores occurred, many of which scattered throughout different parts of the world.

The end of the military dictatorship in 1983 prepared the way for a return of political exiles, many of who had notable educational and skills backgrounds. The return of democracy implied a stimulus for scientific and technological development projects. However, the policies implemented since then have not sufficiently prioritised this type of activity and the financing of universities and research centres has been deeply affected by the cuts encompassed by adjustment policies and policies oriented toward withdrawing State support for scientific and technological development.

In relation to productive activity, from mid-century until the 1970s, their industrial investment saw an increase. Exports of Argentine-made products contributed to boosting the country's levels of technological sophistication and to exporting technology to other countries in the region. (Katz and Bercovich, 1993) This situation was to a certain extent the result of industrial protection policies, but also the expression of efforts made in the research and development sectors and the evolution and accumulation of knowledge in the different branches of engineering.

Towards the mid-1970s, with a drastic change in economic policies when the military dictatorship took over in 1976, one of the darkest chapters in Argentina's history began, involving profound and widespread repression against people involved in the political and union arenas. Industrial protectionism was replaced by policies for opening the national market to foreign trade, provoking a significant fall in industry's participation in the GDP. The structure of industrial production changed radically: "The production of metalworking products and capital goods in general has contracted, while resource-based industries producing steel, petrochemicals, aluminium, edible oil, and so on have expanded considerably" (Katz and Bercovich, 1993 p. 459). One of the consequences of this new type of production was a sharp reduction in the industrial labour force.

The negative impact of the new economic model on the science and technology system in Argentina led to a retraction of investment and an considerable increase in capital flight to other countries. The new forms of industrial production required less investment in research and tended to be based on the purchase of technology from abroad. In the agricultural sector, the presence of INTA played a key role in the sector's development, particularly in the 1960s with the introduction of new farming practices and new organisational standards for production. At the end of the 1970s, the diffusion of hybrids and new varieties of wheat throughout the country, as well as the introduction of soya instigated a new and rapid expansion of agricultural production.

\textsuperscript{6} Venezuela and Chile received Argentine scientists and university professors in the exodus of the 1960s. Later, Brazil and Mexico also became a destination for these migrants.
Agricultural research developed almost exclusively in the sphere of public institutions and especially at the INTA, but has since tended to move increasingly into the hands of the subsidiaries of multinationals operating in the Argentine agricultural sector (Katz and Bercovich, 1993).

The description above shows an industrial and agricultural tradition with high levels of participation by professionals and researchers from Argentina, which presumes a process of accumulation within the science and technology fields. Interviews with university experts and those responsible for scientific and technological policy regarding the recent period coincide in indicating the deterioration of the situation relative to Argentina's history of strong support for scientific and technological development.

The 18 years of democratic government have not been able to rebuild the panorama of scientific and technological research. Not only is it failing to prevent the creation of an environment favouring "brain drain," but it has also failed to consolidate a system that allows greater interaction between the business community and researchers. According to one interviewee, investment in science and technology has significantly decreased with the Argentine economic crisis and the process involving reforms and structural adjustments, but there has also been a lack of progress in formulating appropriate policies to encourage investment.

3.2. Profile and quantification of skilled emigration from Argentina

In this section we present the limited information available for making an approximate diagnosis of the skilled emigration phenomenon. The census statistics gathered in the IMILA\textsuperscript{7} database permit an approximate quantification of the dynamic and based on this, a profile of the migrants with regard to their most general characteristics.

Table 6 provides information on the respective national censuses of the 1990s, allowing the identification of some profile traits of the Argentine flows. In terms of years of study, the Argentine migrants in the United States and Canada are ranked much higher than the combined total of migrants in other locations. However, the participation of those employed as professionals and technicians is greater - in relative terms - in some Latin American countries, as in the cases of Mexico, Venezuela and Brazil. During the 1960s and 1970s thirty percent of the migrants employed in the United States and Canada were labourers and craftworkers, which, added to the high educational level of the total, confirms the observation that skilled migration in those years to the United States, beyond the professionals, included an important portion of skilled labourers that were themselves the result of industrial development in Argentina. 1990s census showed transformations in the workforce - and they begin to take on a prevalent role in jobs related to the service sector and in retail, restaurants and hotels.

The studies performed by the National Science Foundation (NSF) of the United States acknowledges the central role played by foreigners in the development of research and development systems in the United States. According to information from the NSF (1998)

\textsuperscript{7} The appendix on data sources includes references to the IMILA database.
the percentage of foreign-born scientists and engineers among the total individuals working in research and development in the United States is 12%; if only those who hold a doctorate are considered, this percentage jumps to 29%. Of the scientists and engineers admitted into the country annually, the vast majority come from Asia. China and India have become the major suppliers of "brains" for the United States.

From the perspective of the receptor countries, Latin America is relegated to second place, though from the Latin American viewpoint, migration represents an open tap that severely affects its highly specialised sectors. There is an important stock of Argentine scientists and engineers in the United States (table 5), and the number is even more significant if the relative size of this flow is compared to most of the others included on that list.

Specialised tallies of the US Immigration and Naturalisation Service (INS) for the 1970s, 1980s, and the year 1990 show that among those Argentineans granted a resident visa in the 1970s, doctors, health professionals, university professors and teachers predominated, while in the 1980s and 1990, engineers take over the top spot, though university professors and teachers maintain an important presence (Pellegrino, 1993). It should be pointed out that the INS data refers to the work visas granted, and therefore reflects the preference systems of US legislation and not necessarily the migratory inclinations of the population of the country of origin.

An important port of entry for skilled immigration into the United States, and into developed countries in general, is the pursuit of a graduate degree. The number of foreign students in the United States has grown a great deal: from less than 50,000 in the 1959-1960 academic year to nearly 500,000 (precisely 490,933) in 1998-1999 (Institute for International Education, 2000). Latin Americans represent just over 55,000; of them, half are from South America and 2,600 are Argentineans. In table 7 (statistical annexure) we show the proportion represented by Scientists and Engineers, Students and Scholars in the flows from some South American countries and Mexico to the United States. The three indicators show a relatively greater presence of Argentineans, Venezuelans and Brazilians in the three dimensions studied.

In 1995, of the 420,000 students engaged in graduate work in the United States, 100,000 were foreigners and constituted 39% of the total who received doctorates in the natural sciences, 50% in mathematics and computer science and 58% in engineering. Meanwhile, of the 55,444 foreign students receiving doctorates, 63% had plans to remain in the United States, 39.3% with "firm plans." These percentages reached 85% and 79%, respectively, in the case of students from China and India, while students with this intent from Mexico represented one of the lowest percentages recorded, with 37% (Johnson, NSF, 1998). Meyer and Brown (1999) maintain that the intention to remain in the country in which students completed their graduate studies surpasses 50% among those originating from France and Japan.

Although complementary statistics are available, the individuals we interviewed indicated that the majority of the emigration flows of students were directed toward the United States.

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8 The study does not provide information on other Latin American countries.
though also toward some European countries, such as Spain, France and, to a lesser extent, England. In the region, Venezuela and Mexico incorporated professionals, academics and artists in the 1970s. Brazil, which was always the country in the region with the most clearly defined policies on scientific and technological development and with greatest levels of investment, also attracted scientists and students from other South American countries (Argentineans, Chileans and Uruguayans in the 1970s).

Though migration to Venezuela and Mexico is currently a closed chapter, the attraction of Brazil continues. An important factor is that it is the only country in South America that offers scholarships to students throughout the region with a relatively important successful recruitment rate. In addition, Brazil has continued its policy of stimulating industry and has established a strong relationship between industry and universities and research centres.

England, which had important historic ties with Argentina until the mid-20th century, is not highly ranked as a destination for skilled migration. However, some areas of study continue to have significant links, as in the case of the biological sciences.

Studies about return rates have not been conducted in recent years, but there was an important flow of returnees when Argentina's military dictatorship ended, though precise data is not available. According to our interviews, approximately 50% of the Argentine students who pursue doctorates outside the country do not return. This situation could grow worse in the coming years, to the extent that budgetary problems lead to difficulties in creating new jobs, as well as a relative stagnation in the possibility for career ascension.

4. Uruguay: A Country of Net Emigration

Like Argentina and southern Brazil, Uruguay has historically been an important receptor of European immigrant waves. But during the second half of the 20th century it turned into a net exporter of its population. Though the dominant phenomenon from Independence until the mid-20th century was immigration, various testimonies have indicated a movement of population, beginning early on, toward Argentina and Brazil.

Like Argentina, though on a smaller scale, Uruguay enjoyed a successful economic performance as an agro-exporter. Beginning in 1930, it incorporated the model of export substitution, achieving a considerable level of industrial development relative to the country's size and demographic weight. However, industrialisation reached its limits due to a focus almost exclusively on the internal market and to the technological dependence on foreign countries, as Uruguay imported all of its machinery and technology.

The exhaustion of that model toward the middle of the 1950s paved the way for a long period of economic stagnation, with levels of unemployment that ultimately became a structural trend. The labour market proved to have difficulties incorporating new cohorts of young people, even when the size of these groups expanded slowly. Economic opening to the exterior and an end to protectionism for industry led to a reduction in the participation of industrial production in Uruguay's GDP.
From the perspective of educational level, Uruguay stood out for having been the first country in the region to eradicate illiteracy and to achieve significant progress in school attendance rates among children and youth. Until the 1960s, the Uruguayan university held great prestige in the region and attracted students from the rest of Latin America.

In the 1960s, a new emigration impetus toward neighbouring countries began to manifest itself, with particular intensity toward Argentina, though also toward the United States, Canada, Venezuela, Australia and European countries. In 1973, there was a rupture in Uruguay's democratic system and subsequently a prolonged period of political and social instability. Emigration became an alternative for dealing with the conflicts and the restrictions generated in a context of economic and political crisis.

To a certain extent, Uruguay is an atypical case with respect to the general frameworks for analysing international migration, given that it experienced a heavy emigration abroad without being subjected to the pressures of rapid demographic growth, as well as being ranked among the Latin America countries with the greatest levels of human development (table 4).

The Uruguayan case included several phenomena that would ultimately foretell the migration dynamics that would spread to other Latin American countries. In addition to political factors, which obviously acted as a trigger for emigration flows in the 1970s, Uruguay began early on to develop a type of emigration associated with the limitations of its development model. The high educational level of the population and the expectations placed on education as a mechanism of social mobility led to actions and aspirations that were frustrated by the stagnation of the country's economic growth.

The peculiarities of Uruguay's geographical location and its relation to the rest of the region must also be added to the mix of factors. The smallness of the country relative to its neighbours (Argentina and Brazil) imposes limits on possible projects, while at the same time the region's larger cities acted as magnets for the Uruguayan population, offering of greater and more varied opportunities.

Emigration became a relevant option for the middle class sectors with higher educational levels and for labourers and craftworkers with industrial experience. With the crisis of the 1980s, this migration modality extended to other Latin American countries where the reversal of the economic growth trends of the 1960s and 1970s had laid the groundwork for a major break in the development of the middle class sectors. For Uruguayans, emigration was a way to elude the limits that the crisis imposed on possibilities for personal fulfilment and aspirations for lifestyles and consumption levels more in keeping with developed countries, though strongly internalised among a large portion of the Uruguayan population.

The emigration of Uruguayans had a sharp demographic impact for the country. An estimated 310,000 people emigrated from 1963 to 1985, equivalent to 12% of the mean population of that period. Emigration is estimated to have claimed 20% of the economically active population. The net rates of emigration reached their maximum levels between 1972
and 1976, underscoring the impacts of the deepening political crisis, and serving as a response to the arrival of the military dictatorship in 1973.

Though the volume of emigration of those years has not been repeated, it is evident that emigration has become institutionalised, with peak periods determined by situations such as the economic-financial crisis of 1981-1982 and rising unemployment in 2000. The option of emigration has taken on a massive nature, mostly including middle class sectors, professionals in various fields, teachers, professors and, in general, people with high levels of education.

The exodus that followed the installation of the military dictatorship had destinations within Latin America, as well as the United States, Canada, Australia and several European countries. These colonies of emigrants were relatively successful, with an effect on the population that remained in the country and creating conditions for maintaining and encouraging further emigration.

Throughout the 20th century, Uruguay had developed sectors with a solid accumulation of knowledge that kept up with the most advanced circles at the international level. The military dictatorship meant the intervention of the government in the 'Universidad de la República' (University of the Republic, at that time the only one in the country). Repression targeting university professors was particularly harsh and the subsequent emigration of academics was significant. The quality of teaching at the university fell dramatically and entire research groups disintegrated.

These decades have left behind a culture of emigration in Uruguay and an internalised notion among the population - and particularly among young people - that the possibility of prosperity lies outside the country's borders. A National Survey of Youth conducted in 1989-1990 revealed that one out of four young Uruguayans aspired to live, at least temporarily, outside of the country. Also, those with more years of education showed a greater propensity for emigration (Pellegrino, A., Luján, C., 1994).

The existence of already established networks and the "nearness" of the decision to migrate are so strong in Uruguay that any symptom of crisis provokes an immediate emigration reaction throughout broad sectors of the population.

4.1. **A profile of Uruguayan emigrants**

The profile of Uruguayan emigrants described by the 1980 and 1990 censuses show that emigration to Argentina, perhaps due to its sheer size and geographic proximity, is similar in its characteristics to those of the average non-migrant population.

However, if some of the destinations within the region are taken into consideration, such as the cases of Venezuela, Paraguay and Brazil, as well as emigration to the United States and Canada, the selectivity toward groups with higher educational levels is remarkable.
From the perspective of occupational insertion, the relative participation of Uruguayan professionals and technicians is greater in the Latin American countries than in the United States and Canada. In Brazil, Chile and the United States in 1990, there was high participation, relative to the population itself, of managerial officials, directors, etc. As in the case of Argentina, the transformations of the labour market in the last 20 years are also reflected in the flow of Uruguayan emigrants: from a high portion of labourers and craftworkers to Argentina, the United States and Canada, the profile becomes one of Uruguayans working predominantly in services, retail, restaurants and hotels (table 8).

By 1980, 9% of the total Uruguayan professionals and technicians were living in the United States and in 11 Latin American countries (Pellegrino 1993). These calculations do not take into account those residing in European countries or in Australia, which would push the portion above 12%. The estimates based on the censuses of the 1990s are similar.

Data from the US National Science Foundation do not include Uruguay and there are no precise figures available about the number of scientists currently residing abroad. In the network of Uruguayans living in other countries, which has served as a vehicle for information and a link between Uruguayan expatriates, there is a stock of 350 to 400 scientists in different situations: permanent residents abroad, students engaged in graduate work, etc.

According to a 1994 study conducted for the National Council of Research in Science and Technology (CONICYT) of Uruguay (Barbato, C. et al.), the number of full-time researchers in the country was 800. As such, the number of people involved in the international network seems to be all the more significant, as does the number of Uruguayans with graduate degrees registered in US censuses.

The destinations of skilled emigrants are varied. Traditionally there has been an emigration of professionals and artists to Argentina, as Buenos Aires is the regional metropolis, but the prolonged economic crisis in Argentina contributed to making it a less attractive destination for skilled migration. The opposite occurs with Brazil, which, as we have seen, has provided a receptive environment for skilled immigrants.

In addition to the United States, some European countries receive skilled Uruguayan immigrants. Spain and Italy rank first, followed by France and Sweden, which have developed special ties through academic exchanges. In the case of France, there is a long tradition of academic connection that dates back to the 19th century. These ties have been intensified through the relatively strong presence of Uruguayan exiles and political refugees who carried out scientific activities in that country during the Uruguayan dictatorship. The return of these exiles to Uruguay and the ties generated previously has contributed to maintaining an intense co-operation with France. In the same way, the ties created with Swedish academic circles by Uruguayan political exiles generated networks of academic exchange that remain active today.

Academic links with the United Kingdom are not as intense as with France and Spain. However, some specialties in chemistry, biochemistry and biological sciences maintain
somewhat greater levels of exchange. There has also traditionally been a tendency among Uruguayans to pursue graduate studies in economics at British universities, though the number of people involved remains relatively low. Currently there is no evidence that these kinds of ties with the United Kingdom will grow. In contrast there are more visible policy initiatives in Germany, for example, towards intensifying academic ties and offering graduate scholarships and specialisations for Uruguayan students.

5. Impact of Brain Drain on Argentina and Uruguay

From the demographic perspective, the impact of emigration on Uruguay is significant and is an additional contribution to the accelerated ageing of the population. Emigration, heavily concentrated among younger age groups, accentuated the trend of the ageing of society, whether directly, through the loss of young people, or indirectly, in virtue of the reduction in the number of births. In the case of Argentina, the weight of emigration on the total population is of lesser impact and the emphasis tends to fall on the qualitative aspects involved in the dynamic.

In Uruguay, the emigration of skilled young adults has implied a loss of scarce resources that severely hurts the quality of the nation's work force. The impact of emigration on the country's labour assets is of critical consequence. Some professions have also seen big emigration pushes: architects and doctors in the 1970s, engineers and computer scientists in the 1980s and 1990s. Throughout all periods teachers and university professors have been particularly affected by emigration. In the fields of nursing and medical services the connections established several decades ago with employing companies have determined that, in some years, nearly the entire graduating class in those fields emigrated.

There are no recent evaluations available on the effects of emigration on the workforce in either of the two countries. Even so, there is no evidence of a supply shortage in the job market. The effects are more likely felt in the loss of quality for some sectors, in the absence of specialised personnel and, in a more general sense, in the loss of the most dynamic individuals. It must be added that there are localised deficits in certain specific activities as a result of the emigration of most specialists involved in those fields.

Both Argentina and Uruguay are among the Latin American countries with the greatest proportion of young people involved in tertiary-level education, with admission rates among the highest on the continent (UNESCO, 1999). Furthermore, the number of graduates from institutions of higher education in relation to the total population is greater than that of other Latin American countries.

Unemployment levels among university professionals tend to be lower than the average of the economically active population as a whole, which means we can conclude, based on this indicator, that there is not an oversupply of graduates for the local labour market.

A study conducted in Uruguay (Buchelli, Casacuberta, 2001) shows that "over-education" does not exist in the Uruguayan work force. In other words, there is not an imbalance
between the supply and demand resulting from an increased number of workers with tertiary-level education.

According to the authors of the study, employment reaches 90% among university graduates, compared to 50% among individuals with only a primary school education, and that the labour insertion of university-educated workers is, in general, appropriate to their training. Unemployment rates are significantly less among the most educated: the average rate for the 1991-1997 period was 7.7% for people with only primary-level education, and 2.2% for those who completed a university degree. On another front, the return rates of university-educated individuals were found to have increased in the 1990s with respect to the previous decade, and the income of the population with most years of education increased more than that of the rest of the population in the 1990s (Buchelli, Casacuberta, 2001).

In the Argentine case, unemployment among university graduates has been historically lower than that of the economically active population in general. However, there has been an appreciable rise in underemployment among individuals with university studies completed or partially completed (INDEC, 1998).

In the late 1990s, unemployment reached approximately 16%, an unprecedented level for Argentina. Though unemployment among professionals was much lower, it passed from 1.6% in 1990 to 7.8% in 2000. According to a survey conducted by the Ministry of Education among graduates of tertiary-level institutions, there is a marked heterogeneity of situations among graduates, depending on their fields, and women in general have fallen dramatically behind, with respect to men (El Clarín Digital, Aug 8, 2000).

Meanwhile, some studies (Becaría and López, 1997; Fernández, L., 2000) indicate a growing demand for skills for activities that do not really require them, pointing to a large sector of the population that is over-qualified for the work performed.

Although it is a dynamic that is difficult to measure, emigration does not serve to relieve pressures on the labour market, presumably due to the supply-demand of certain professions, but rather that those who emigrate are usually people whose professions are in demand in the receptor countries. Meanwhile, they are also sought in the countries of origin because the demand for their skills outstrips the supply. One example of this involves specialists in information technology and in communications systems.

Remittances, sent by emigrants back to their families in their countries of origin, are one aspect of the emigration phenomenon with positive effects. However, in Argentina and Uruguay there are no calculations of the total remittances received from abroad, and the way national accounting is handled, at least in Uruguay, does not currently permit making a valid estimate.

In addition, the real effect of remittances can be cast into doubt, in comparison, for example, to the massive flow of remittances to Mexico and Central America. The social composition

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9 This difference is due to the high participation in the labour market of women with university education.
of migration from the countries considered in this study, particularly in reference to skilled migrants from the middle and upper social sectors, means that migration is usually an individual decision or a strategy of a nuclear family that would tend to emigrate as a whole. In general, it does not imply responsibilities to other family members in the country of origin. This topic should be the subject of further research that includes the gathering of data that today are not available. However, it is important to stress that the issue of remittances does not come up in the debate about international migration in these two countries and, as a result, is not perceived as a factor affecting Uruguayan or Argentinean society.

It is likely that the most serious effect on society is not economic in the short or middle term. Emigration creates a collective feeling of discouragement about the possibilities of development in these countries and the image of successful emigrants consolidates the perception that the promising future is one that lies outside of the country. The assessment of the incidence of these kinds of attitudes and feelings in the development of a country of course is no easy task; but what is certain is that this sort of factor cannot be ignored when explaining the consequences of emigration.

The panorama transmitted by the communications media and by observers and politicians tends to highlight emigration's negative impacts and focus on loss. Though some positive issues are indicated, such as the benefits of mobility, emigration is presented in political discourse as a failure of the political project. In the interviews we have conducted, there is a marked difference between situations that involve transnational activities, with periodic returns, and emigrations that are permanent.

The opinions arising in the interviews express contradictory visions with respect to the positions of recent governments on the question of how to retain scientists. Some maintain that this continues to be a primary concern of the governments, but that economic crisis and financial limitations in the public sector do not permit the implementation of appropriate measures. In contrast, the viewpoint of other interviewees is that skilled emigration, as well as scientific and technological development, do not constitute priorities for the political world in either Argentina or Uruguay. The failure to formulate consistent and lasting policies on the matter is just one more expression of governmental lack of interest.

6.  Policies Intended to Reverse Brain Drain

In both countries programmes were implemented in the period following the military dictatorships to foment the return of citizens who had emigrated. Re-democratisation paved the way for high expectations as far as developing new projects and rebuilding activities or initiating new endeavours. On the other hand, in a more stable way, the governments implemented policies intended to favour the return of exiles through tax exemptions for the goods the migrants brought back to the country, among other incentives.

In Uruguay, the return of democracy was accompanied by a series of initiatives intended to reclaim the scientific diaspora. The government created the National Commission for Repatriation, which, with the support of the International Organisation for Migration (IOM),
contributed to the reintegration of all types of returnees, though it played an especially important role in the reintegration of scientists and professionals with ties to the academic world. With the creation of the Sectorial Commission of Scientific Research (CSIC) in 1990 at the University of the Republic, specific initiatives were founded in order to reverse brain drain: the programme for the hiring of scientists, in which priority went to Uruguays who wanted to return to the country, and the economic support programme for returnees (especially students who had gone abroad for graduate studies), in order to facilitate their reinsertion into the university environment.

From this perspective, the most innovative endeavour was the creation of the Programme for the Development of Basic Sciences (PEDECIBA) in 1986. This initiative arose from within the academic community - both inside and outside the country - and had the support of the United Nations Development Programme (UNDP) and of the Uruguayan government.

Basic Sciences included a number of new programmes intended to stimulate the field, with loans granted by the IDB for the development of science and technology playing a key role. The explicit objectives were the creation of incentives to retain scientists and recover those who had emigrated, and to permit an improvement in the working conditions for the return of students who completed graduate work abroad.

From the perspective of reconnecting with the emigrated scientific community, the period following the return of democracy implied a unification of efforts for the sake of the country's scientific reconstruction. An example of an organised core was AFUDEST, created by a group of Uruguayan academics and professionals living in France. Also implemented was a project intended to re-link Uruguays residing outside the country with groups or national projects inside the country, an initiative that won the support of the International Organisation for Migration (IOM), and functioning under the Ministry of Foreign Relations. This project operated for only a brief time because it did not have the continuity necessary to strengthen the ties between migrants and residents.

The network of Uruguays abroad was an example of the relationship among emigrant communities and the national scientific community that stimulated the return and re-linking of scientists and promoted the creation of the PEDECIBA. This network, however, has not had continuity for which it was initially created. It has been divided into a series of smaller networks that instead allow a continuity of joint activities within specific disciplines.

In Argentina, there were governmental measures introduced following the end of the dictatorship to promote the return of exiles and to create links with citizens living abroad who could contribute to the country's development (Decree No. 1798 of June 8, 1984, created the National Commission for the Return of Argentineans Abroad).

In addition to this policy, which was general in scope, there were other specific return-related efforts implemented by the National Council of Scientific and Technological Research (CONICET) since its founding in 1958 (Lértora Mendoza, 1998). These measures consisted of paying moving and set-up costs for the returnee, and later expanded to other benefits, such as paying airfare for the individual's spouse and minor children.
In 1987, CONICET created the category of Corresponding Member of the Scientific-Technological Research Degree, through which citizens living abroad could be designated honorary titles. These researchers can be hired for short periods, or else fully incorporated into the research career if they choose to return to Argentina (Lértora Mendoza, 1998).

In August 1990, the Secretariat of Science and Technology set up (through Resolution 261), the National Programme for Linkage with Argentine Scientists and Technicians in the Exterior (PROCITEXT). As a result, by February 1994, there were 248 people registered as specialists who pursue their activities abroad, most of who were living in Western Europe (48%) and North America (44%) (Dellacha, J.M., 1994).

From the private sphere, the 'Fundación Antorchas' (Guiding Light Foundation) grants subsidies for the reinsertion in Argentina of those who have received graduate scholarships from universities abroad and also subsidies for the repatriation of scientists living in other countries who choose to return to Argentina (Lértora Mendoza, 1994).

As in Uruguay, there exist many specific networks for certain disciplines or areas of specialisation through which Argentine emigrants and residents interact. The results of these programmes have been varied. Initiatives to encourage return seem to have been more successful in Uruguay, where the simultaneous creation of the PEDECIBA was able to generate a positive climate for the reinsertion of scientists in the basic fields (Barreiro and Velho, 1998). In Argentina, according to Lértora Mendoza (1998, p. 267), "the response was rather limited, and a notable percentage of those who returned did not achieve adequate placement so emigrated once again."

There are no recent assessments of the reinsertion programmes or the operations of the initiatives and networks created for these ends. In Uruguay, after the initial impulse that led to the return of scientists and academics following the end of the military dictatorship, and after the effects of reinsertion projects had waned, the academic network began losing strength and has practically disappeared in the sense of its original objective. As an evaluation of the policies of return and reconnection among emigrants and residents, the first general conclusion is that for these to be successful and to transform into ongoing efforts there must be policies of sustained incentives in the country of origin. Their effectiveness depends above all on the stimulus and support provided by national policies.

In the second place, the national stimulus of solidarity has played an important role in certain constituent instances (as those following the end of the dictatorships could have been) though feelings with respect to the national community have a dose of volunteerism that, with the passage of time, tends to wear thin. This can only be overcome if motivation can be founded upon bases that are solidly established locally.

7. Conclusions and Policy Suggestions

Throughout the year 2000 we have witnessed the resurgence of the emigration debate in Argentina and Uruguay. New waves of emigration have contributed to this and have been
widely covered in the communications media and in political discourse. "Brain drain" arises immediately as the centre of discussion and the media have made it a focus of their coverage.

Drawing up policies to reverse brain drain obviously requires identifying the causes. It is widely known that, in both countries, the critical political situation of the 1970s was a driving force behind emigration. In the case of Argentina, the instability reigning throughout a fairly long period in universities and research centres implied widespread discouragement that fuelled emigration.

Efforts to prevent brain drain reflect a complicated objective and tend to have limited results. The growing demand for young people, especially skilled young adults, that is predicted in the coming decades in developed countries will become a magnet that will be very difficult for the countries of the South to counteract.

From the point of view of the country of origin there is broad agreement in attributing the causes of economic migration to three main factors: wages, work conditions (infrastructure, availability of materials, instruments, etc.) and social recognition. In relation to the academic and research spheres, there is the added argument of the need of those involved in projects to maintain continuity, an indispensable condition for any activity that requires long-term programming.

The weight attributable to each factor is different in the two countries studied, and the periods and circumstances in which emigration has occurred are also different. Pessimism is arguably greater in the Argentine case than in the Uruguayan case, though in the latter our interview subjects coincided in saying that the country had reached a point where it risks losing all that was accumulated over the last 15 years (since the dictatorship) - if a new institutional economic push does not occur.

Wages are the factor most often cited as the cause of emigration by scientists. The lack of infrastructure in laboratories is a growing factor of dissatisfaction with work conditions. The situation in this respect is very uneven among the various institutions. In both countries loans from the Inter-American Development Bank (IDB) have contributed appreciably to improving infrastructure, though there are significant problems related to the availability of funds to maintain and update such improvements.

Scientific and technological investment in Uruguay and Argentina is very limited, ranked among the lowest in Latin America (around 0.3% of Uruguay's GDP and no more than 0.5% of Argentina's GDP). Both countries enjoyed a high level of scientific development at one point, and it constitutes one of Argentina's "national glories." The State's insufficient investment in science and technology is linked to the fact that there are difficulties in connecting industry and productive activities in general with research financing.

To be effective, policies for reversing brain drain must, in the first place, eliminate the reasons that push individuals to decide to emigrate. Second, strategies must be formulated to capitalise on the positive side of having citizens living in noteworthy situations in the
developed countries, in order to strengthen ties to facilitate the transference of the experiences and knowledge acquired.

Policies should be oriented primarily toward retaining contact and connecting researchers and members of the academic spheres. It is this type of skilled migrant that, alongside independent professionals and entrepreneurs, can become involved in activities that imply benefits and transfers of knowledge and technology for the country of origin. It is universities and academics in general that can ensure the reproduction of the system.

The Uruguayan case is particularly suited to the type of activity that tends toward uniting academic communities "within and without" in order to boost the country's scientific capital. A small country in demographic terms, the national space is limited for building critical mass as far as the diversity required by the scientific world today. The creation of broader spaces, in the framework of regional integration and the unification of emigrant academic communities with those in the country of origin seem to be a promising alternative.

The existence of a community that has been consolidated, though with difficulties, has set the pace of Uruguayan scientific development. In this case, one could say that it was pressure from the scientists themselves that led to growth, given that there has not been a clear and defined State policy in regard to scientific and technological development.

Other types of migrants, for example those who work as employees or advisers to multinational companies or for international institutions, have fewer opportunities to take part in activities that stimulate local development and allow the transfer of technology. Professionals employed by multinational companies constitute an important sector of the "transnational" migrant communities. It is difficult for such migrants to cooperate with their countries of origin, in that the companies demand a certain amount of fidelity to the firm, which prevents its employees from taking part in activities involving the transference of expertise or technology.

From the perspective of developed countries, cooperation targeting the development of critical mass in the countries of origin of skilled migration could play a vital role. Initiatives to create beneficial tax systems proposed within the United Nations Commission on Trade and Development (UNCTAD) have not borne out and, though they should not be cast aside, other strategies that might be easier to implement should be considered.

Potential policies are all linked to the creation of an environment that stimulates the permanence of potential migrants in the country of origin and the return of emigrants by fomenting spaces of employment. The developed countries will continue to be difficult competition for developing countries and skilled migration will continue to be among the important development questions in the coming decades. A central objective is to seek cooperation agreements and exchanges that allow interaction and the creation of joint initiatives.
One idea is to create scientific cooperation programmes to consolidate ties between migrants and their countries of origin, through financing of travel, granting scholarships to students or other similar measures. In the case of disciplines in which there is a certain level of development in the countries of origin, this could also entail the creation of teaching programmes and of research centres that would allow the interaction of local resources with those from abroad, stimulating a process of networking with expatriate colleagues.

From the perspective of creative activities related to production or services, "joint-venture" agreements with local groups that would permit working under "developed" conditions and retaining resources in the countries of origin could also prove to be an attractive strategy. It is essential in these cases that technological or scientific development is rooted in the local community.

It has not escaped our understanding that the demand for labour at all levels, especially in the sectors of advanced science and technology, implies the risk that this cooperation would turn into a vehicle for further emigration from the countries of the South. This could be the result of open-ended or unexpressed proposals or simply the consequence of specific events or evolutionary processes that turn out to be more powerful than the stated intentions.
### Statistical Annexure

**Table 1. Summary of accumulated volume of emigrants from Latin America and Caribbean included in censuses taken in other countries of the region and in the United States and Canada**

<table>
<thead>
<tr>
<th></th>
<th>Accumulative number of emigrants</th>
<th>Growth rates (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total emigrants from Latin America and the Caribbean</td>
<td>1,468,472</td>
<td>3,091,632</td>
</tr>
<tr>
<td>Emigrants to the United States</td>
<td>820,423</td>
<td>1,725,408</td>
</tr>
<tr>
<td>Mexican emigrants to the United States</td>
<td>575,902</td>
<td>759,711</td>
</tr>
<tr>
<td>Emigrants to the United States (excl. Mexicans)</td>
<td>244,521</td>
<td>965,697</td>
</tr>
<tr>
<td>Emigrants to Canada</td>
<td>82,685</td>
<td>323,415</td>
</tr>
<tr>
<td>Emigrants to other countries in Latin America and the Caribbean</td>
<td>648,049</td>
<td>1,283,539</td>
</tr>
</tbody>
</table>

%age of Latin American and Caribbean emigration to the U.S. (inc. Mexicans) | 55.9 | 55.8 | 64.7 | 74.5%
%age of Latin American and Caribbean emigration to the U.S. (excl. Mexicans) | 27.4 | 41.4 | 46.8 | 58.3%
%age of Latin American and Caribbean emigration to Canada | 2.7 | 4.9 | 4.7 |
%age of L.A. & C. emigrants to other countries in L.A. & C. (excl. Mexicans) | 44.1 | 41.5 | 30.3 | 20.7 |
%age of L.A. & C. emigrants to other countries in L.A. & C. (incl. Mexicans) | 72.6 | 55.0 | 45.7 | 34.0 |

Source: Pellegrino, A. (2000) estimation with data from IMILA CELADE.

\( ^a \) Data from 1986 y 1996 censuses were used for Canada. Data are not available for 1960

\( ^b \) Data from seven countries were used for the 1960 figures, for 1970 20 countries; 1980: 19 countries; 1990: 18 countries

\( ^c \) Data from The Foreign Born Population in the United States
Table 2. Professionals and technicians born in LAC countries recorded by the censuses in Latin America and the United States (Number and percent growth. 1980 and 1990 Census.)*

<table>
<thead>
<tr>
<th>Country of birth</th>
<th>In Latin American Countries</th>
<th></th>
<th>In the U.S.A.</th>
<th></th>
<th>% Growth</th>
<th>% Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Argentina</strong></td>
<td>8786</td>
<td>7431</td>
<td>-15.4</td>
<td>4882</td>
<td>7766</td>
<td>9614</td>
</tr>
<tr>
<td><strong>Bolivia</strong></td>
<td>5398</td>
<td>7926</td>
<td>46.8</td>
<td>999</td>
<td>1809</td>
<td>2187</td>
</tr>
<tr>
<td><strong>Brazil</strong></td>
<td>2163</td>
<td>2495</td>
<td>15.3</td>
<td>2138</td>
<td>3474</td>
<td>**</td>
</tr>
<tr>
<td><strong>Chile</strong></td>
<td>10,872</td>
<td>11,969</td>
<td>10.1</td>
<td>1984</td>
<td>4405</td>
<td>5067</td>
</tr>
<tr>
<td><strong>Colombia</strong></td>
<td>16,572</td>
<td>17,523</td>
<td>5.7</td>
<td>5240</td>
<td>8724</td>
<td>15,518</td>
</tr>
<tr>
<td><strong>Costa Rica</strong></td>
<td>550</td>
<td>494</td>
<td>-10.2</td>
<td>1110</td>
<td>1773</td>
<td>**</td>
</tr>
<tr>
<td><strong>Cuba</strong></td>
<td>1860</td>
<td>1849</td>
<td>-0.6</td>
<td>26,195</td>
<td>42,066</td>
<td>46,792</td>
</tr>
<tr>
<td><strong>Ecuador</strong></td>
<td>1465</td>
<td>1639</td>
<td>11.9</td>
<td>1901</td>
<td>3436</td>
<td>6066</td>
</tr>
<tr>
<td><strong>El Salvador</strong></td>
<td>1252</td>
<td>802</td>
<td>-35.9</td>
<td>686</td>
<td>2202</td>
<td>6678</td>
</tr>
<tr>
<td><strong>Guatemala</strong></td>
<td>383</td>
<td>828</td>
<td>116.2</td>
<td>1008</td>
<td>2058</td>
<td>4381</td>
</tr>
<tr>
<td><strong>Haiti</strong></td>
<td>149</td>
<td>223</td>
<td>49.7</td>
<td>2654</td>
<td>5832</td>
<td>12,455</td>
</tr>
<tr>
<td><strong>Jamaica</strong></td>
<td>**</td>
<td>**</td>
<td>**</td>
<td>15,899</td>
<td>28,020</td>
<td>15899</td>
</tr>
<tr>
<td><strong>Mexico</strong></td>
<td>1230</td>
<td>782</td>
<td>-36.4</td>
<td>12,689</td>
<td>34,937</td>
<td>60,965</td>
</tr>
<tr>
<td><strong>Nicaragua</strong></td>
<td>1769</td>
<td>906</td>
<td>-48.8</td>
<td>813</td>
<td>1696</td>
<td>4449</td>
</tr>
<tr>
<td><strong>Panama</strong></td>
<td>698</td>
<td>596</td>
<td>-14.6</td>
<td>1859</td>
<td>5335</td>
<td>6671</td>
</tr>
<tr>
<td><strong>Paraguay</strong></td>
<td>5878</td>
<td>7238</td>
<td>23.1</td>
<td>**</td>
<td>444</td>
<td>361</td>
</tr>
<tr>
<td><strong>Peru</strong></td>
<td>5889</td>
<td>8412</td>
<td>42.8</td>
<td>276</td>
<td>4853</td>
<td>9051</td>
</tr>
<tr>
<td><strong>Rep Dom</strong></td>
<td>707</td>
<td>925</td>
<td>30.8</td>
<td>1520</td>
<td>3373</td>
<td>8584</td>
</tr>
<tr>
<td><strong>Trinidad &amp; Tobago</strong></td>
<td>**</td>
<td>279</td>
<td>**</td>
<td>5372</td>
<td>9550</td>
<td>77.8</td>
</tr>
<tr>
<td><strong>Uruguay</strong></td>
<td>7202</td>
<td>9314</td>
<td>29.3</td>
<td>488</td>
<td>919</td>
<td>1133</td>
</tr>
<tr>
<td><strong>Venezuela</strong></td>
<td>368</td>
<td>687</td>
<td>86.7</td>
<td>631</td>
<td>1773</td>
<td>3471</td>
</tr>
<tr>
<td><strong>Honduras</strong></td>
<td>447</td>
<td>**</td>
<td>**</td>
<td>1481</td>
<td>2656</td>
<td>79.3</td>
</tr>
<tr>
<td><strong>Guyana</strong></td>
<td>**</td>
<td>**</td>
<td>**</td>
<td>4117</td>
<td>8327</td>
<td>102.3</td>
</tr>
</tbody>
</table>

Source: Data from CELADE-IMILA.
Table 3. Professionals born in Latin America and the Caribbean living in the United States and selected Countries of Latin America and the Caribbean (*)

Numbers and percentage of total economically active population in each country.

Professionals as percentage of total economically active population

<table>
<thead>
<tr>
<th>Country</th>
<th>Professionals born in USA</th>
<th>Professionals born in LA&amp;C countries of origin</th>
<th>Percentage of total economically active population living in USA</th>
<th>Percentage of total economically active population in LA&amp;C</th>
<th>Percentage of total economically active population in LA&amp;C countries of origin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mexico</td>
<td>60965</td>
<td>nd</td>
<td>2.6</td>
<td>0.8</td>
<td>10.8</td>
</tr>
<tr>
<td>Cuba</td>
<td>46792</td>
<td>nd</td>
<td>10.9</td>
<td>22.4</td>
<td>nd</td>
</tr>
<tr>
<td>Jamaica</td>
<td>28020</td>
<td>nd</td>
<td>13.2</td>
<td>nd</td>
<td>5.4</td>
</tr>
<tr>
<td>Colombia</td>
<td>15518</td>
<td>17523</td>
<td>8.8</td>
<td>5.2</td>
<td>nd</td>
</tr>
<tr>
<td>Haiti</td>
<td>12455</td>
<td>223</td>
<td>9.1</td>
<td>16.1</td>
<td>nd</td>
</tr>
<tr>
<td>Argentina</td>
<td>9614</td>
<td>7431</td>
<td>19.1</td>
<td>25.6</td>
<td>23.7</td>
</tr>
<tr>
<td>Tr. y Tobago</td>
<td>9550</td>
<td>279</td>
<td>12.9</td>
<td>14.0</td>
<td>3.5</td>
</tr>
<tr>
<td>Perú</td>
<td>9051</td>
<td>8412</td>
<td>10.0</td>
<td>22.3</td>
<td>nd</td>
</tr>
<tr>
<td>Rep. Dominicana</td>
<td>8584</td>
<td>925</td>
<td>5.2</td>
<td>8.3</td>
<td>7.3</td>
</tr>
<tr>
<td>El Salvador</td>
<td>6678</td>
<td>802</td>
<td>2.4</td>
<td>25.3</td>
<td>8.1</td>
</tr>
<tr>
<td>Panamá</td>
<td>6671</td>
<td>596</td>
<td>13.8</td>
<td>43.3</td>
<td>10.1</td>
</tr>
<tr>
<td>Ecuador</td>
<td>6066</td>
<td>1639</td>
<td>6.9</td>
<td>9.6</td>
<td>1.0</td>
</tr>
<tr>
<td>Chili</td>
<td>5067</td>
<td>11969</td>
<td>15.7</td>
<td>7.0</td>
<td>5.3</td>
</tr>
<tr>
<td>Nicaragua</td>
<td>4449</td>
<td>906</td>
<td>5.0</td>
<td>35.2</td>
<td>8.8</td>
</tr>
<tr>
<td>Guatemala</td>
<td>4381</td>
<td>828</td>
<td>3.3</td>
<td>4.5</td>
<td>4.8</td>
</tr>
<tr>
<td>Venezuela</td>
<td>3471</td>
<td>687</td>
<td>18.4</td>
<td>34.7</td>
<td>11.7</td>
</tr>
<tr>
<td>Bolivia</td>
<td>2187</td>
<td>7926</td>
<td>12.0</td>
<td>7.8</td>
<td>3.4</td>
</tr>
<tr>
<td>Uruguay</td>
<td>1133</td>
<td>9314</td>
<td>9.4</td>
<td>9.0</td>
<td>12.4</td>
</tr>
<tr>
<td>Paraguay</td>
<td>361</td>
<td>7238</td>
<td>11.5</td>
<td>4.5</td>
<td>7.2</td>
</tr>
</tbody>
</table>

Source: Estimated with data of CELADE-IMILA

(*) Data from: Argentina, Brazil, Chili, Mexico, Venezuela and Panama National Censuses
Table 4. Social and economic indicators of South American region

**Average gross domestic product (GDP)**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Argentina</td>
<td>3.0</td>
<td>4.3</td>
<td>2.8</td>
<td>0.9</td>
</tr>
<tr>
<td>Bolivia</td>
<td>0.4</td>
<td>5.6</td>
<td>3.9</td>
<td>0.1</td>
</tr>
<tr>
<td>Brazil</td>
<td>6.8</td>
<td>6.1</td>
<td>8.6</td>
<td>1.5</td>
</tr>
<tr>
<td>Chile</td>
<td>3.9</td>
<td>4.2</td>
<td>2.6</td>
<td>2.6</td>
</tr>
<tr>
<td>Paraguay</td>
<td>2.4</td>
<td>4.7</td>
<td>8.7</td>
<td>3.2</td>
</tr>
<tr>
<td>Uruguay</td>
<td>2.1</td>
<td>5.0</td>
<td>2.7</td>
<td>0.3</td>
</tr>
</tbody>
</table>

Source: ECLAC, Statistics Yearbooks, Latin America and the Caribbean

**Income distribution** (Gini Coefficient)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Uruguay</td>
<td>0.33</td>
<td>0.43</td>
<td>0.44</td>
</tr>
<tr>
<td>Argentina</td>
<td>0.41</td>
<td>0.46</td>
<td>0.52</td>
</tr>
<tr>
<td>Chile</td>
<td>0.47</td>
<td>0.52</td>
<td>0.52</td>
</tr>
<tr>
<td>Brazil</td>
<td>0.63</td>
<td>0.62</td>
<td>0.63</td>
</tr>
</tbody>
</table>

Source: Thorp; Rosemary (1998), p.372

**Degree of industrialisation.**
(Percentage of manufacturing in gross domestic product, based on market prices, 1970)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Argentina</td>
<td>26.2</td>
<td>29.2</td>
<td>33.1</td>
<td>34.2</td>
</tr>
<tr>
<td>Brazil</td>
<td>21.6</td>
<td>26.8</td>
<td>28.9</td>
<td>29.7</td>
</tr>
<tr>
<td>Uruguay</td>
<td>21.9</td>
<td>25.1</td>
<td>25.3</td>
<td>27.4</td>
</tr>
<tr>
<td>Paraguay</td>
<td>15.8</td>
<td>14.6</td>
<td>16.6</td>
<td>16.4</td>
</tr>
<tr>
<td>Chile</td>
<td>12.6</td>
<td>15.0</td>
<td>16.1</td>
<td>17.4</td>
</tr>
<tr>
<td>Bolivia</td>
<td>13.8</td>
<td>12.9</td>
<td>14.3</td>
<td>15.6</td>
</tr>
</tbody>
</table>

Source: ECLAC, "América latina en el umbral de los años 80". Santiago de Chile, ECLAC, United Nations, p.57
Table 5. Argentina: some characteristics of emigrants in countries of residence Censuses. Circa 1990

<table>
<thead>
<tr>
<th></th>
<th>Chile</th>
<th>Venezuela</th>
<th>Brazil</th>
<th>Paraguay</th>
<th>Mexico</th>
<th>USA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total population</td>
<td>34,415</td>
<td>9070</td>
<td>25,468</td>
<td>47,846</td>
<td>4635</td>
<td>77,986</td>
</tr>
<tr>
<td>Median Age</td>
<td>38.1</td>
<td>42.14</td>
<td>24.6</td>
<td>39</td>
<td>39.9</td>
<td></td>
</tr>
<tr>
<td>Sex Ratio</td>
<td>96.8</td>
<td>109.3</td>
<td>114</td>
<td>98.3</td>
<td>100.3</td>
<td>104.3</td>
</tr>
<tr>
<td>Percentage of 10 and over years of schooling completed</td>
<td>48.9</td>
<td>71.9</td>
<td>59.46</td>
<td>32.1</td>
<td>69.3</td>
<td>74.43</td>
</tr>
<tr>
<td>Activity rate</td>
<td>42.2</td>
<td>60.6</td>
<td>55.4</td>
<td>47.6</td>
<td>54.4</td>
<td>74.0</td>
</tr>
<tr>
<td>Percentage of employees and domestic servants</td>
<td>63.6</td>
<td>51.8</td>
<td>29.3</td>
<td>62.0</td>
<td>70.2</td>
<td></td>
</tr>
<tr>
<td>Percentage of professionals and technicians</td>
<td>12.3</td>
<td>27.1</td>
<td>25.4</td>
<td>11.1</td>
<td>42.8</td>
<td>19.14</td>
</tr>
<tr>
<td>Percentage of operators and craftsmen (excluded rural workers and machine operators)</td>
<td>21.3</td>
<td>12.9</td>
<td>11.4</td>
<td>27.3</td>
<td>5.3</td>
<td>11.4</td>
</tr>
<tr>
<td>Percentage of rural workers (farmers, stockmen and others)</td>
<td>4.4</td>
<td>1.3</td>
<td>2.3</td>
<td>11.1</td>
<td>0.5</td>
<td>0.6</td>
</tr>
<tr>
<td>Percentage in Community, social and personal services</td>
<td>23.2</td>
<td>26.3</td>
<td>27.0</td>
<td>23.7</td>
<td>45.7</td>
<td>20.53</td>
</tr>
<tr>
<td>Percentage in wholesale trade, retail trade and restaurants and hotels</td>
<td>25.1</td>
<td>21.3</td>
<td>22.8</td>
<td>27.3</td>
<td>20.6</td>
<td>38.9</td>
</tr>
</tbody>
</table>

(**) In USA, 12 and more years of schooling completed
Source: Pellegrino (2000) data from IMILA-CELADE
Table 6. Number of foreign-born S&E degree holders, by place of birth: 1997

<table>
<thead>
<tr>
<th>Country of birth</th>
<th>Number</th>
<th>Country of birth</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>India</td>
<td>184,900</td>
<td>Indonesia</td>
<td>6600</td>
</tr>
<tr>
<td>China</td>
<td>131,300</td>
<td>Ecuador</td>
<td>6500</td>
</tr>
<tr>
<td>Philippines</td>
<td>92,800</td>
<td>Czechoslovakia</td>
<td>6400</td>
</tr>
<tr>
<td>Germany</td>
<td>84,100</td>
<td>Dominican Rep</td>
<td>6400</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>74,600</td>
<td>Spain</td>
<td>5900</td>
</tr>
<tr>
<td>Canada</td>
<td>72,700</td>
<td>South Africa</td>
<td>5700</td>
</tr>
<tr>
<td>Taiwan</td>
<td>68,100</td>
<td>Haiti</td>
<td>5700</td>
</tr>
<tr>
<td>Korea</td>
<td>53,000</td>
<td>Austria</td>
<td>5400</td>
</tr>
<tr>
<td>Iran</td>
<td>48,300</td>
<td>Ireland</td>
<td>5400</td>
</tr>
<tr>
<td>Vietnam</td>
<td>45,500</td>
<td>Yugoslavia</td>
<td>5300</td>
</tr>
<tr>
<td>Former Soviet Union</td>
<td>39,500</td>
<td>Bangladesh</td>
<td>5200</td>
</tr>
<tr>
<td>Japan</td>
<td>37,700</td>
<td>Sweden</td>
<td>3900</td>
</tr>
<tr>
<td>Mexico</td>
<td>35,100</td>
<td>Chile</td>
<td>3300</td>
</tr>
<tr>
<td>Cuba</td>
<td>29,000</td>
<td>Other foreign place of birth</td>
<td>160,200</td>
</tr>
<tr>
<td>Poland</td>
<td>22,800</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Italy</td>
<td>18,100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pakistan</td>
<td>17,600</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jamaica</td>
<td>16,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>France</td>
<td>15,200</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Colombia</td>
<td>14,500</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Egypt</td>
<td>14,400</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lebanon</td>
<td>14,200</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Israel</td>
<td>12,900</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Greece</td>
<td>11,700</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Argentina</td>
<td>10,900</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Turkey</td>
<td>9900</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Netherlands</td>
<td>9800</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Romania</td>
<td>9300</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nigeria</td>
<td>9200</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peru</td>
<td>9200</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hungary</td>
<td>9200</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 7. Individuals trained in science and engineering, students and scholars born in L.A. countries, living in US %age of total (born in each country) living in US, 1997

<table>
<thead>
<tr>
<th>Country</th>
<th>S&amp;E</th>
<th>Students</th>
<th>Scholars</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mexico</td>
<td>0.5</td>
<td>0.1</td>
<td>0.01</td>
</tr>
<tr>
<td>Brazil</td>
<td>6.7</td>
<td>5.2</td>
<td>0.89</td>
</tr>
<tr>
<td>Venezuela</td>
<td>10.1</td>
<td>6.1</td>
<td>0.34</td>
</tr>
<tr>
<td>Colombia</td>
<td>4.0</td>
<td>1.2</td>
<td>0.08</td>
</tr>
<tr>
<td>Peru</td>
<td>4.1</td>
<td>0.9</td>
<td>0.07</td>
</tr>
<tr>
<td>Chile</td>
<td>3.7</td>
<td>1.3</td>
<td>0.24</td>
</tr>
<tr>
<td>Ecuador</td>
<td>2.6</td>
<td>0.7</td>
<td>0.02</td>
</tr>
<tr>
<td>Argentina</td>
<td>11.5</td>
<td>2.6</td>
<td>0.53</td>
</tr>
<tr>
<td>Uruguay</td>
<td>nd</td>
<td>1.9</td>
<td>0.28</td>
</tr>
</tbody>
</table>

Source: Data for Students and Scholars From the Open Doors Report, 1998/99 I.I.E.
Table 8. Uruguay: Selected characteristics of emigrants

Censuses circa 1990

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total emigrants</td>
<td>5454</td>
<td>133,653</td>
<td>1599</td>
<td>3029</td>
<td>22,141</td>
<td>18,211</td>
<td>3,163,763</td>
</tr>
<tr>
<td>Mean age</td>
<td>37.9</td>
<td>38.3</td>
<td>34.87</td>
<td>34.3</td>
<td>38.6</td>
<td>34.0</td>
<td></td>
</tr>
<tr>
<td>Sex ratio</td>
<td>108.6</td>
<td>95.6</td>
<td>102.4</td>
<td>127.2</td>
<td>115</td>
<td>106.1</td>
<td>93.9</td>
</tr>
<tr>
<td>Percentage of 10 and over years of schooling completed</td>
<td>64.3</td>
<td>40.2</td>
<td>78.29</td>
<td>61.8</td>
<td>47.8</td>
<td>81.2</td>
<td>26.7</td>
</tr>
<tr>
<td>Males</td>
<td>66.1</td>
<td>38.9</td>
<td>79.15</td>
<td>61.4</td>
<td>51.7</td>
<td>81.6</td>
<td>24.5</td>
</tr>
<tr>
<td>Females</td>
<td>62.3</td>
<td>41.5</td>
<td>77.41</td>
<td>62.2</td>
<td>43.4</td>
<td>80.8</td>
<td>28.7</td>
</tr>
<tr>
<td>Activity rate</td>
<td>66.8</td>
<td>68.4</td>
<td>53.4</td>
<td>64.2</td>
<td>59.8</td>
<td>76.2</td>
<td>57.0</td>
</tr>
<tr>
<td>Males</td>
<td>86.2</td>
<td>88.1</td>
<td>72.7</td>
<td>82.0</td>
<td>81.5</td>
<td>87.9</td>
<td>70.6</td>
</tr>
<tr>
<td>Females</td>
<td>45.5</td>
<td>49.5</td>
<td>33.9</td>
<td>41.2</td>
<td>35.1</td>
<td>63.9</td>
<td>44.6</td>
</tr>
<tr>
<td>Percentage of professionals and technicians</td>
<td>19.3</td>
<td>8.9</td>
<td>38.2</td>
<td>19.9</td>
<td>14.7</td>
<td>9.4</td>
<td>7.0</td>
</tr>
<tr>
<td>Percentage of directors, managers, etc.</td>
<td>10.7</td>
<td>1.6</td>
<td>20.5</td>
<td>10.0</td>
<td>20.8</td>
<td>19.2</td>
<td>3.8</td>
</tr>
<tr>
<td>Percentage of operators and craftsmen</td>
<td>18.4</td>
<td>33.6</td>
<td>10.5</td>
<td>15.8</td>
<td>18.3</td>
<td>21.6</td>
<td>22.1</td>
</tr>
<tr>
<td>Percentage of rural workers (farmers, stockmen and others)</td>
<td>1.3</td>
<td>nd</td>
<td>1.4</td>
<td>2.4</td>
<td>4.6</td>
<td>1.5</td>
<td>5.1</td>
</tr>
<tr>
<td>Percentage in industry</td>
<td>20.1</td>
<td>14.5</td>
<td>15.0</td>
<td>11.3</td>
<td>8.5</td>
<td>19.4</td>
<td>14.9</td>
</tr>
<tr>
<td>Percentage in wholesale trade, retail trade and restaurants and hotels</td>
<td>27.9</td>
<td>21.0</td>
<td>18.7</td>
<td>32.4</td>
<td>25.9</td>
<td>18.9</td>
<td>19.3</td>
</tr>
<tr>
<td>Percentage in community, social and personal services</td>
<td>26.1</td>
<td>19.8</td>
<td>36.9</td>
<td>36.8</td>
<td>44.4</td>
<td>35.1</td>
<td>26.6</td>
</tr>
<tr>
<td>Percentage arrived to the USA in the 80’s</td>
<td>16.0</td>
<td>33.5</td>
<td>nd</td>
<td>35.3</td>
<td>31.6</td>
<td>45.3</td>
<td>nd</td>
</tr>
</tbody>
</table>

Source: (Pellegrino, 2000) with data of IMILA-CELADE

1 Persons of Hispanic Origin in the United States 1990 cp-3-3, Bureau of Census.
2 Urban workers and machine operators
3 Skilled workers
4 Population 25 and over with 9 years and over of schooling
5 Sales workers
Graph 1. U.S. educational level of population born in Latin American Countries. 1990 Census
Graph 2. Percentage of persons of Latin American origin with doctorate degrees as % of the total population age 25 and over in each group.

U.S.A. 1990 Census
Appendix

Skilled migration: definitions and data sources

Assessments of skilled migration tend to adopt different definitions about the type of specialists included under this designation.

The bibliography covers a range of definitions, from limited ones that include only scientists and engineers, to broader ones that encompass all professionals and technicians and even, in some cases, skilled labourers. The selection from among these definitions depends, obviously, on the objectives of the diagnostic to be carried out and also on the type of information available.

Statistics on skilled migration are scarce and, save for scarce exceptions, do not permit a breakdown analysis. Studies of specific fields are rare and in most cases tend to be based on a limited number of cases. As Gaillard and Gaillard (1998) point out, the available statistics do not allow us to paint a reliable picture about this type of migration.

Frequently countries hold statistics on their labour "stocks" arising from national censuses or from ongoing surveys of households. These offer a snapshot of the stocks of skilled immigrants on a given date, but are not sufficient for studying the dynamic of mobility. Also, it must be considered that the censuses of immigrant-receiving countries usually suffer high levels of omission, an issue that is more acute when there is a great deal of illegal immigration, though in the case of skilled immigrants, the rate of illicit entry into the country is generally low.

In extremely rare cases, statistics on skilled migration flows are available. In the United States, the annual statistics of the INS provide detailed and useful information, but refer only to the visas granted and not to the real levels of immigrant entry into the country annually. The granting of visas usually corresponds to immigrants residing during previous years in that country and their fluctuation reflects, to a great extent, the preference categories established under US immigration laws.

Even when there are limitations on information, in the case of Latin America, the database of the IMILA project (International Migration in Latin America)10 must be taken into account. This, together with CELADE (Latin American Centre for Demography) efforts to standardise the data, makes Latin America a privileged region as far as the availability of information on international migration, though always within the constraints of census statistics.

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10 A database on international migrants born in Latin American countries. It was created by the Latin American Centre for Demography (CELADE) in the early 1970s and represents a pioneering effort in the gathering of information about international migration.
The data gathered at IMILA correspond to successive census rounds in Latin American countries and in the United States and Canada\textsuperscript{11}. An additional effort could involve collecting information corresponding to the European countries, Australia and Canada, which have also attracted numerous Latin American emigrants in recent decades. In the case of Europe, an important portion of Latin American immigration has taken place through the extension of citizenship to European emigrants' descendants in the Americas, generating additional difficulties in identifying Latin American migrants as the European countries tend to categorise immigrants by their citizenship, not their country of birth.

The data we present in this report correspond to the definitions the national censuses in Latin America have for categorising the economically active population. This specifically refers to the first group of occupations: "professionals and technicians." In the same way, we treat the information on educational level, in which we focus on migrants with education at the tertiary or university level. Apart from this we present information put together by the National Science Foundation, which uses the category of "scientists and engineers."

In addition to the definition of what is understood to be a "skilled migrant," it is important to consider the various types of migratory flows. The differences between these movements result in a range of modalities for potential linkages with the countries of origin and therefore require different policies.

Migration typologies can be carried out from different perspectives:

A first type of classification prioritises the motivations behind migration and, here, a general division puts forced migrations (driven by violence or by political repression) on one side and migrations based on economic or employment motives on the other. In Latin America, violence has been a major cause of migration and this type of movement has particularly involved professionals, academics and intellectuals, which tend to form part of the elements that actively oppose political and military violence.

A second type of classification refers to the duration of the migrant's stay outside of the country of origin. In this case, movements are considered permanent when they involve migrants adopting a new country of residence with intentions of spending the rest of their lives there, or, alternatively, flows that imply temporary, seasonal or pendulum moves of variable duration. The migrations of highly skilled individuals usually include a variety of situations as far as the duration of the movements, both in the case of scientists and intellectuals belonging to the academic environment and of professionals who perform their work for transnational companies or international institutions. The potential for recovering "talents" and the assessment of the impacts of emigration on the countries of origin are quite different depending on whether they involve permanent or temporary emigrations.

Among the "voluntary" migrations, or those that are not forced by persecution or discrimination, it is essential to identify the type of labour insertion the emigrants achieve,

\textsuperscript{11} In the case of Canada, for 1990, the total volume of Latin American migrants was available, but not their socio-economic profile.
given that this has significant influence over the kind of relationship they can maintain with their countries of origin.

Multinational corporations have tended in recent years to further expand their productive activities to new locations, and the individuals with labour ties to such companies usually have a high level of mobility that implies limited possibilities for social integration in the country of residence. Their connections to their countries of origin may remain active in the affective realm but they are unlikely to be able to interact in terms of exchange of knowledge or of skills outside the sphere of the company for which they work.

As far as the members of the academic, scientific or artistic world, universality is their intrinsic quality. Though in this area the process of globalisation is nothing new, the development of communications technologies has fed the potential for exchange, the realisation of international projects and the creation of networks of individuals involved in activities of common interest. Our opinion is that it is precisely through these migrants that joint actions toward stimulating development in the country of origin can be achieved, involving migrants and non-migrants alike, and fomented through appropriate State policies.

An array of voluntary motives must be added to these types of labour insertions. On the one hand, there are retirees who, with retirement funds or pensions, in many cases can return to their countries of origin maintaining their professional activities or teaching, which implies a transfer of knowledge. On the other are students, who pursue graduate studies in a different country and in many cases permanently extend their stay. The presence of students tends to be the initial link that unites research and development efforts in developed countries with a student's country of origin, and also, in this case, supports the implementation of appropriate policies.
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