

Skills Circulation and the Advent of a New World Order

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Abstract

Is the knowledge world organized differently today with respect to yesterday?

At the world level, observers used to highlight the asymmetry between the North and the South, which would shape the unidirectional flows of competence from the former to the latter. The 'center' would attract the brains and human resources in science and technology. Today, by contrast, one tends to stress the greater complexity of flows' directions and the 'circulation' of brains rather than their 'drain'. Some see this trend as making migration contribute to development. Others, in a more skeptical way, argue that the core features of the world have not changed.

This article does not aim at identifying which position is right, but rather at discussing the core arguments in this debate, on the basis of empirical evidence and of the interpretations it can be associated with. The first part analyses the evolution of data over the last decade. The role of diasporas is the object of the part 2, which demonstrates the potential, but not automatic, link between migrants and their country of origin. The third part connects the major transformations of the scientific and technological world with current and future mobility trends; if flows are less unidirectional than before, the social and political conditions in which they take place remains uncertain. In conclusion, the paper argues that the 'circulation' approach to migration, that is now at least a decade old, is going through a new phase and must therefore be reassessed.

Circulation: Increasing Trend with Different Impacts

Considerable progress has been made over the last decade in the statistical measurement of migration, and especially as far as skilled migrants are concerned. But most of the data stems from the same source, namely the 2000 census as analysed by the OECD. By the middle of the 2000 decade, this source offered an exceptionally rich

overview and enabled for the first time general and precise analysis. This is no longer the case, as the 2010 census results are still unavailable and existing data therefore growingly outdated. Recent, but partial, sources of information are necessary to overcome this obstacle. 2000 data clearly indicated a growth of the migration of the highly skilled over the last decade of the 20th century:

	1990		2000		Growth 1990-2000 %
North America	716,742	5.90%	949 566	4.70%	32.5
Europe	4,869,745	39.80%	6 864 409	33.90%	41
Africa	723,907	5.90%	1 372 712	6.80%	89.6
Asia	3,781,331	30.90%	7 002 491	34.60%	85.2
Oceania	220,624	1.80%	379 067	1.90%	71.8
Latin America	1,924,622	15.70%	3 681 800	18.20%	91.3

Table 1. Skilled Migrants in OECD Countries, by Region of Origin 1990-2000

Source: Docquier and Lowell 2008

	2007	estimate	Growth 1990-2007 %
North America	1,112,543	4.30%	55.2
Europe	8,261,164	31.90%	69.7
Africa	1,826,875	7.10%	152.4
Asia	9,256,303	35.80%	144.8
Oceania	489,977	1.90%	122.1
Latin America	4,911,825	19%	155.2

Table 2. Skilled Migrants in OECD countries, by Region of Origin 1990-2007

Source: Lozano and Gandini 2009

A simple extrapolation of these trends until 2007 logically leads to the consolidation of the circular migration phenomenon identified during the previous decade.

Whereas migrants from Europe and North America represented almost half of skilled migrants in 1990, they were less than 40% in 2000 and estimated at only 35% in 2005. The growth in the number of skilled migrants from the South is between 122% and 155%, while it is around 70% and 55% for those from the North.

The estimates post-2000 must however be treated carefully, as this decade has been marked by major events with a strong impact on skilled migration dynamics:

- The Y2K and the crash of the 'dotcom' new economy, which lead to the return of IT workers on a temporary basis in the United States, before and around the turn of the millennium.
- 9/11, 2001 and the restrictions to the entry of foreign students and workers;
- Violent economic and financial crises in some countries (Argentina and Uruguay in 2002 for example) or whole regions (Southern Europe in 2008-2010), which affected labour market in both sending and receiving states.
- The emergence of the so-called 'BRIC' countries (Brazil, Russia, India and China), which are major exporters of skilled workers and students, where sustained growth during

the whole decade has modified migration dynamics.

However, despite these evolutions, available evidence shows that skilled migration remains at high levels.

The large number of foreign students in the US (a major source of migrant workers), for instance, has considerably increased during the 1980s. Despite a mild slowdown during the 1990s, the numbers have widened again throughout the 2000s (Table 3).

This trend is not exclusive to the United States. In Europe, Spain has also met an important growth of its skilled migrants' rates in the last decade. Revealed by a poll led by the Spanish 'National Survey of Immigration' (NSI), these figures are however quite outdated, since they correspond to a period preceding the outbreak of the 2008 crisis. More than a general increase (in absolute terms) of high-skilled migrants, these results also indicate the particular growth of the share of Latin American high-qualified migrants arriving to Spain (Pellegrino et al 2010).

In Asia, a traditional host of skilled migrants like Japan has kept its usually high rates of skilled migration after the turn of the millennium – and even increased it for certain professional categories (chart 1).

Partial but detailed data allow for a more refined analysis of the evolution of certain professional categories, bringing to light a range of new situations. In the case of high-skilled migra-

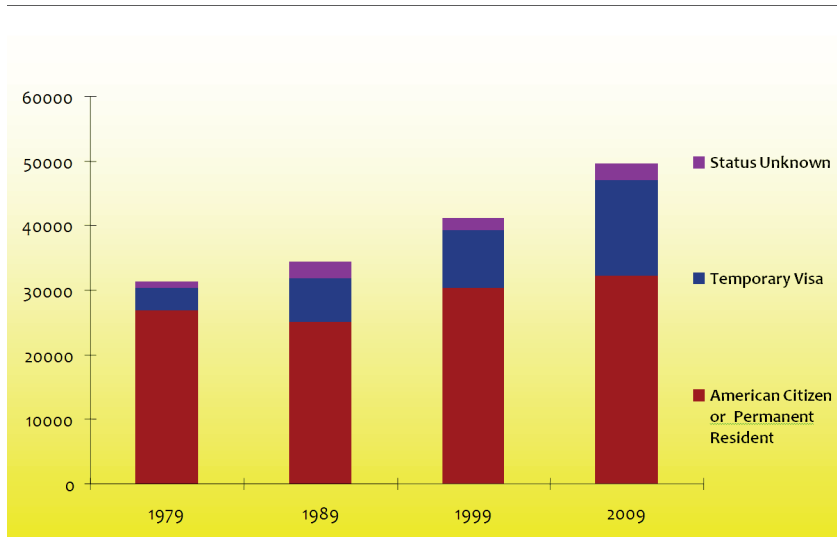


Figure 1: Students in the United States, residence status

Source: NSF/NIH/USED/USDA/NEH/NASA, 2009 Survey of Earned Doctorates, in Luchilo 2011.

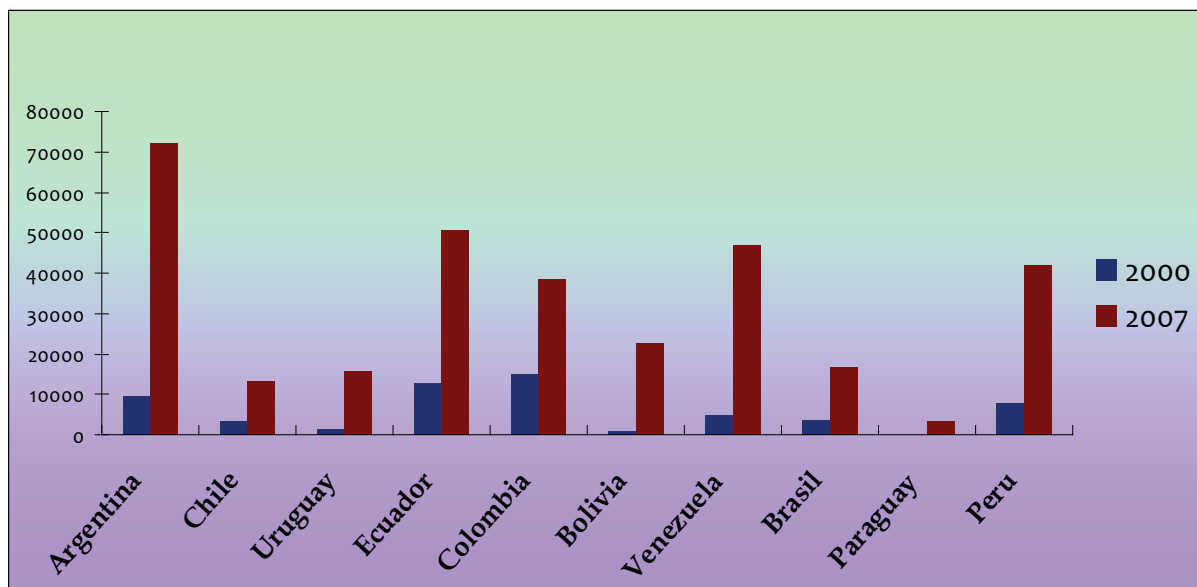


Figure 2: Evolution of South American migrant professionals from 2000 to 2007 in Spain

Source: World Bank survey ENI and 2007, treatment Pellegrino et al.

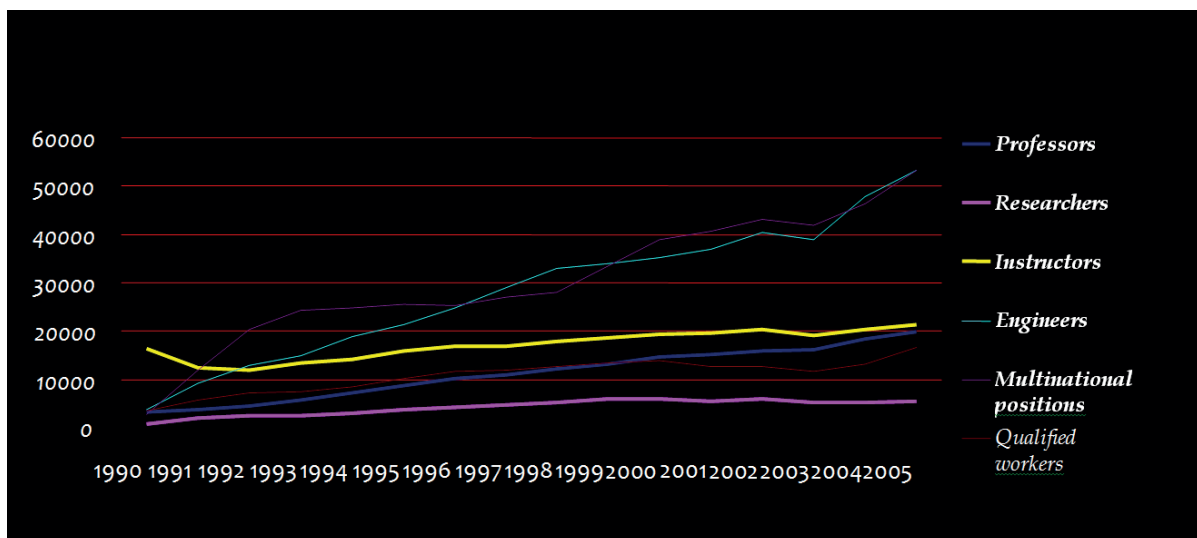


Figure 3: Evolution of entries and visas for foreign professionals in Japan from 1991 to 2005

Source: Statistics Bureau, Japanese Ministry for Internal Affairs and Communications, in NSF, S&E Indicators, 2010

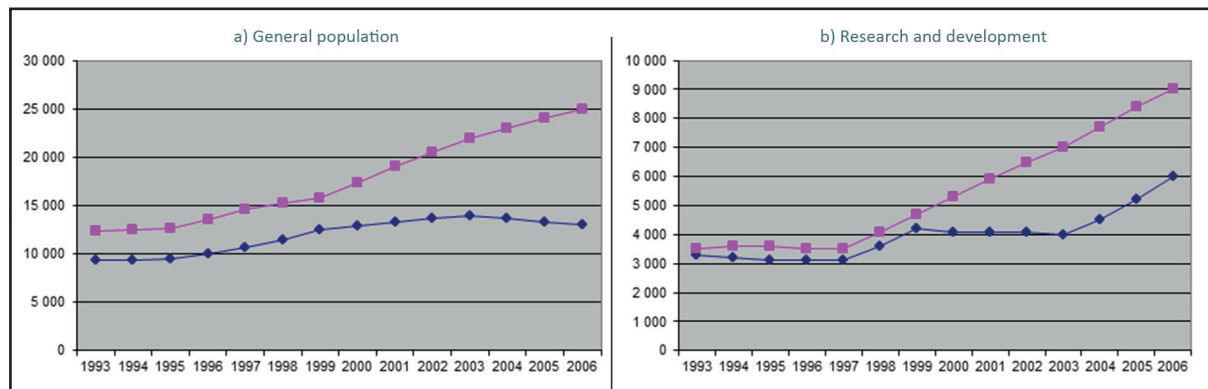


Figure 4: Evolution of high-skilled population from Argentina (blue curve) and Colombia (pink curve) in the United States, from 1993 to 2006

Source: NSF and author's calculation

tion from Argentina and Colombia to the United States, for instance, a careful analysis reveals a more diversified evolution than certain figures suggest at first sight. After a marked increase from the late 1990s until 2004, it is possible to identify a relative stagnation of skilled Argentinian migration after 2004, while skilled Colombians have continued coming to the US. Yet, when looking within the general migrant population, more precisely at the number of individuals engaged in knowledge-creation (i.e., research and development, a sub-category within the high-qualified migrant population), it is noticeable that increasing expatriation continues for both groups (Figure 4a, 4b).

This differentiation between categories of high-qualified individuals is hardly trivial. It indicates in fact that a number of situations should be more carefully interpreted. Revisionist approaches of the brain drain, which claim that the emigration of individuals holding a higher education diploma is a major incentive for human capital formation in developing countries, were in reality based a partial observation.¹ These claims rest on the finding that the expatriation rate of this population is generally low, around 10%. If one in ten individuals who has gone through the higher education system of a given developing country emigrates to another OECD country, the emigration rate is indeed quite modest. And there is little doubt that the

increase in higher education cohorts by age in developing countries has increased considerably – despite these individuals' expectation to emigrate. In this way, Western (developed) countries, which accounted for more than 2/3 of the global student population 40 years ago, accounted for no more than 1/3 in the late 2000s (GED UNESCO 2009). But when one refines the analysis, notably by disaggregating the quite broad population of higher education degree holders, the end result/finding varies considerably. In this way, in Latin America, according to the National Science Foundation (NSF) data, the expatriation rate of people involved in research activities (knowledge creation), compared to other OECD countries, may range from 12% to 48%, depending on analysis/approach used (Figure 3).

OECD databases – including the recent and comprehensive e-DIOC (Dumont, Spielvogel and Widmeier 2010) – do not detail the different ISCED 6 educational categories (graduate and postgraduate) for all home countries. The situation is quite similar for ISCO professions' subcategories. When data is partially available, the comparison with their corresponding populations in the country of origin cannot be consistent. The use of the NSF database for expatriates in the United States and the UNESCO-RICYT database for their fellow citizens back home allows for overcoming this technical limitation. It also allows for going beyond the rough picture offered by the inclusion of a too broad population (Meyer 2011a).

¹ For a review and analysis of this approach and its critics, see Meyer 2010 p 96-97.

Likewise, when one varies the criterion for inclusion in the high-qualified category, the interpretation between the local and expatriate population may also change. For the local population, having 1 in 10 – or even 1 in 5 – of its high-qualified abroad can be a stimulating factor. Yet, if half of them emigrate, it then becomes a quite serious challenge, since it is difficult to ensure a certain sustainable and non-dissipative accumulation in-house skills.

In summary, in recent decades, the mobility of high-skilled individuals has been growing worldwide. Its scale and impact vary widely across countries and categories. Country variations have been detailed in different analyses, which reveal two contrasting scenarios: while big, emerging countries enjoy a relatively modest (high-skilled) circulation, small, isolated and poor countries lose a significant portion of their (already deficient) human resources (Claemens, Docquier and Rapoport 2005, Dumont and Lemaitre 2005). One thing is sure: this mobility, combined with other factors and dynamics, has an impact on the development of countries of origin and destination.

Emergence of a Multipolar World and First Signs of New Movements

In the present debate on the relation between migration and development, the role played by the diasporas is often highlighted (Haas 2007). Their tangible contributions in terms of transfers or investments are sometimes emphasized today but in the past they were questioned due to their paradoxical effects (*Dutch disease*, consumption versus local production, ostentatious vs. creative investment etc.). These financial benefits apart, contributions made by highly qualified expatriates who are part of formal associations or informal networks, through their participation in joint intellectual projects with their home countries are often mentioned. These contributions, which are mainly cognitive and inter personal in nature, can be classified under the heading of “*social remittances*”. Though difficult to measure, their effect on development seems crucial and often neglected (Hujo and Piper 2010). The Indian IT industry and its rise in the world in which the diaspora played a decisive role has been carefully examined (Leclerc and Meyer 2007).

A retrospective analysis of the Indian case shows the intertwining of external as well as internal factors and the importance of trans-

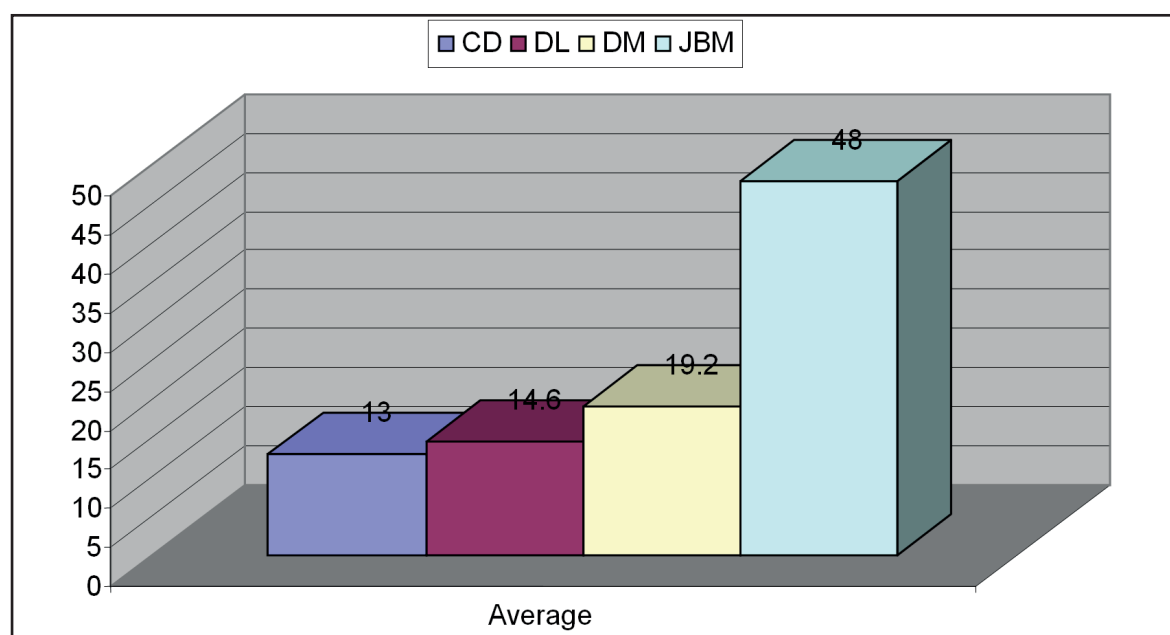


Chart 1: Expatriation rates of qualified personnel in Latin America (2000) in different studies (Carington and Detragiache 1999, Dumont and Lemaitre 2005, Docquier and Marfouk 2005, Meyer 2011a)

Source: OECD, SESTAT and RICYT

national players (diaspora networks, MNCs). It is a unique case, yet not necessarily a model that can be replicated (Pandey and al. 2006). Other emerging countries have adopted different strategies with varying degrees of success. China and its government sponsored programmes that were more voluntary initially, turned out to be less successful in the area of techno-economic innovations to begin with, but thanks to the diaspora, they laid the foundations for a promising academic growth (Meyer 2004, Xiang 2007). This rapid academic growth was soon followed by technological development whereas the Indian academic growth story was more subdued that today it needs government impetus (Mani 2010, Ronping 2010). After much thought, Mexico embarked on efforts to systematically bring together its large and qualified diaspora (Gonzalez Gutierrez 2006). The mobility of its citizens however seems to be totally dictated by the logic of its northern neighbour's labour market. Unlike India, Mexico ends up contributing to the development of its northern neighbour without improving prospects of its own development in a significant and endogenous way (Delgado Wise 2010). Brazil, for its part, feels that its old policy of retaining advanced level students – fearing brain drain – has crossed its limits. It has gravely isolated the country from the happenings in the world and has in some way slowed down present day development (Ramos and Velho 2011). This seems to be corroborated by the slow rate of growth of its technology sector in comparison to other countries or even to its own recent academic growth (de Brito Cruz et Chalmovich 2010).

Moving on from the case of the major emerging countries, the role of transnational networks and diaspora groups (comprising highly qualified expatriates) in development needs to be examined. Hundreds of cases have been recorded and some theoretical lessons seem to have been learned. They show the importance of an improved social environment, aided by mediators, to strengthen the ties between the country of origin and the expatriate communities (Meyer 2011b). In this perspective, incubators favourable to the development of these ties

are demarcated and nurtured². A fact however already stands out: maps featuring the mobility of skills are today being redrawn by the expansion of creative capacities and their multiple connections as well as by the emergence of poles of knowledge production in the south.

Until the end of the 90s, the world of science and technology was represented as a triad, comprising North America, Western Europe and Japan (UNESCO 1998). From the middle of the 2000s, the notion of a quadriad emerged, thanks to the rapid rise of China in the field of S & T (OST 2008). Today, the term most appropriate to describe the prevailing situation seems to be “multipolarity” (Khadria and Meyer 2011, UNESCO 2010, World Bank 2011) for, S & T activities have spread to areas other than those to which they had been confined until recently. In five years, money spent by developing countries on R & D has increased by almost 100% (Hollanders and Soete 2010). Academic production in certain countries is expanding at a fast pace (China, Brazil to a larger extent and India to a lesser extent) whereas in Europe, this rise is less pronounced and in the US it is almost at a stand-still. This is evident from the record of the respective publications of these countries in referenced journals (Cookson 2010, according to a study done by Thomson Reuters). This increase may not as yet be clearly reflected in the global patent numbers (a modest 3 point rise, Hollanders and Soete 2010), but certain indicators take us exactly there (Hepeng 2008, Sri Raman 2009, Le Monde 2010). With its sharp increase in the export of high tech products, Asia has even overtaken the US and many of the North American multinational companies have outsourced their R&D activities to emerging countries (Global Market Institute 2010).

At the same time, when the number of researchers in developed countries increased by 400,000, in the developing countries this number grew by one million. Globally, in five years, the share of the latter increased from less than 30% to close to 40% whereas the share of the con-

² Refer to the project *Création d'Incubateurs des diasporas du savoir pour l'Amérique Latine* : CIDESAL : www.observatoriodiasporas.com

ventional triad countries went down by the same extent. Today, the share of both the groups is likely to be 50:50. There has therefore been a shift in the centre of gravity, which has certainly had an effect on the mobility of people. In fact, some indicators already show that this multipolarity does not favour the moving human resources to concentrate in any one place. Countries where internationally mobile students choose to settle down are also getting diversified. Today, the US is getting only one out of every five foreign students, whereas 20 years ago, this figure stood at one out of three. Nevertheless, their total number has considerably increased. The share of France, Germany and the UK has remained static or has declined whereas that of Australia, South Korea, New Zealand, South Africa and China has witnessed a sharp increase (Khadria and Meyer 2011).

In the case of professionals, the emergence of new poles of attraction is similarly noticeable. In China, the 100 Talents programme which has already brought back to the country 2000 senior researchers concluded with a call made to 1500 foreign project heads (Zighuo 2009). The temporary mobility of scientists between China and the rest of the world declined in the last few years of the 2000s: more researchers go to China than Chinese who go abroad (Ronping 2010, p 296). Without cutting down on its own flow of professionals and students to other parts of the world, China seems to be the favourite destination of more and more knowledge carriers and such mobilities strengthen its relations with its neighbours and others (Su Yan 2010). This phenomenon is not restricted to China alone; it is also clearly visible in Brazil. Having been the magnet of attraction of Latino-American students and researchers for more than a decade now, Brazil has cast its net far and wide to draw a growing contingent from Europe (Nunes and Battista 2011, Khadria and Meyer 2011). At the same time, other Latino-American countries in the southern cone like Argentina, Chile and Uruguay witness a wave of students and researchers returning to their respective countries under the cover of the financial crisis in Europe and the economic recovery in this part of the world.

It is too early to work out a complete pattern for these new circulations. But the multifold increase in the availability of information leads us to imagine that the phenomenon is widespread and not restricted to the major emerging countries alone. Morocco for example, which has for a long time now been sending a large chunk of its internationally mobile students to France, is of late witnessing a decline in the number of its Ph.D. students going there (Campus France 2011), whereas new Asian destinations (China and even Korea, India and Malaysia) are emerging and Canada's share has been increasing considerably (Harakat 2011). At the same time, this country (Morocco) has been receiving students from Sub Saharan Africa (Berriane 2009), particularly for professional training in private institutions. Hundreds of these students get scholarships from the kingdom and many others come with their own means. Such a large number of students from many different countries go to Morocco that local observers are being told that no African country is left unrepresented in this melting pot of nationalities seen on Moroccan campuses.

How can these changes be interpreted? As changes that have taken place in the power relationship based on science and technology as much as in the resultant new mobility of people?

Some authors are of the opinion that international division of scientific labour is governed by a subordinate integration process (Kreimer and Zabala 2007, Losego and Arvanitis 2008). Scientific knowledge is concentrated in big laboratories in a few privileged places. These places garner human capital and substantial material in such a way that they become centres of accumulation and reproduction of cognitive resources. Mobilities make these star referral centres shine by disseminating scientific practices, experimental procedures and research topics far and wide, thereby keeping the interests of the main laboratories alive. Researchers who return to their countries of origin after being trained in these places are endowed with special knowledge bearing these interests and are the best agents who can make this scientific achievement touch a wider base. Laboratories that adopt them on

their return home become subsidiaries of the laboratories that trained them and they willingly become subcontracting agents of the latter.

This pattern was best suited to describe the situation that prevailed under the triad, when big public laboratories organized their work around a relatively homogenous and geographically well-defined scientific field. Will subordinate integration still hold if this field explodes institutionally and spatially, with new players coming from all over? It may even increase, claim some people who have a paroxysmal view of immaterial economics (Zacchary 2008). The US would delegate the end activities of production – scientific and technical innovations – to emerging countries so that it would be in a position to concentrate on delivering preliminary services (finance, management, marketing, trade). Outsourcing R&D work that is knowledge intensive and has high added value to areas that have qualified people will bring down costs...and will ease recourse to talents brought in from outside since the US will no longer need them.

This extreme view is not corroborated by empirical data. It obviously contradicts the trends that have been observed with regard to growth and sharp increase in mobility (refer to first part). The major developed regions receive an increasing number of skilled workers from outside even though their share in this international and intercontinental movement shows a rapid dip. Besides, the scientific and technical policies in these areas always favour investments in knowledge (UNESCO 2010).

In fact, in this multifold increase in places of innovation across the world, mobilities are perceived to be creators of networks. They propel their activities and indispensable exchanges and are encouraged so that constantly evolving sectors can be uplifted. This mobility paradigm therefore acts as a positive reference to explain for example the productive collaborations brought about by the student migrations between China and Australia (Turpin et al. 2010). Seen from a different point of view, it advocates an increased opening to Brazilian university agencies obsessed with brain drain and to laboratories criticized for retaining their students, so as to put an end to

mind numbing parochialism (Balbachevsky 2009, Ramos and Velho 2011).

We look at mobility today in a positive light because it is perceived to be a cosmopolitan science naturally sustained by the largest possible cross fertilization. At the same time, it definitely brings hope of a better globalization – with the help of a knowledge based society – which can serve as a universal base for development. However, some implications of this widespread movement of highly qualified people across the world are already visible and need to be examined carefully.

First of all, though widespread, this movement does not innervate all parts of the globe in the same way. It is strongest in the least developed countries but at the same time, accumulations that happen in other developing countries do not seem to take place here (see part 1 and Dickson 2009). Apart from this unequal international distribution of the fruits of dissemination brought about by mobility, its dynamics need to be questioned. These movements sustain a higher number of poles but always poles with high concentrations that are not located within the borders of high density *clusters* and its effects at the local level are not obvious (Meyer 2004, Kreimer and Meyer 2008). The danger that a group of interconnected hubs may prevail at the expense of a second rung of entities is always there. Terms like centres or poles of excellence, “*world class universities*”, preparation of categories and lists based on their ranking are not simply innocent acts of classification. They show a new, rather transnational polarization with scope for exclusions, which will shape the new migratory flows. A study of radial and transversal mobilities will offer a lot of scope for future research because studies till now have only focused on important cities in the world or science and technology parks (Saxenian 2006). This will bring to light the effects of redistribution or new mobilities as well as the conditions that favour this.

Besides, the widespread movement of skills and their overall increased availability make the conditions in which they happen more commonplace, at least in some aspects. The advantages and privileges that are normally associated with

the status of an expatriate are on the decline in companies that give employment. Since the beginning of the 2000s, international management consultant firms suggest reducing allowances, packages and other compensations usually linked to mobility. These are more modest now and the possibility of taking recourse to well qualified local personnel as substitutes (often thanks to their training abroad) is being examined by MNCs to cut costs linked to salaries (Joerres 2011).

The qualifications of a migrant do not seem to count any more when it comes to employment or job position. Many detailed studies carried out for Latino-Americans in the North American and Spanish labour market show that persons who hold degrees in higher education are not shielded from unemployment, under employment or disqualification and inadequate incomes (Lozano and Gandini 2010; Koolhaas, Fiori and Pellegrino 2011). The social condition of mobile professionals should no longer be considered a natural advantage and the very notion of elite – often used in an acritical manner – should be questioned. Some recent studies have tried to break down this all-encompassing population and classify them under different categories (Luchilo 2011, pp. 10-11) : executives and heads who are frequent travellers; technicians and engineers, “economy class travellers”; scientists and academicians of different standing depending on their reputation and that of their institutions; entrepreneurs/explorers and students, temporary and sometimes short-term visitors. Knowledge workers belonging to different professions are hardly immune to the levelling down of their living conditions and mobility. Today it is important to document these new categories and stay away from elitist presuppositions related to a migrating population, for the very rough statistical categories had kept us in the dark about the numerous divisions.

In a general way, when it comes to analysing the movements of qualified persons, questions about social sustainable development have to be raised. Is the present movement of knowledge and of people credited with this knowledge headed towards a global cross fertilization with

multiple, shared, distributed, accumulative and reproducible spin-offs? Or is it happening in a segmented space, controlled by rival, unstable and dissipative appropriations?

The innovation processes that show an upward climb are certainly worrying observers who feel that the fast pace of the market is potentially harmful, particularly taking into account the long time over which this research has been done (Hollanders and Soete 2010). Intense and widespread movement of knowledge workers is not exempt from similar risks either. Socialisation of skills is indispensable as this is what enables them to contribute to the economies and to the environments in which they are trying to integrate. The logic of a qualified international labour market can interfere with that of the constitution and the implanting of a knowledge community in a social space. It is one of the fundamental stakes of mode IV of the agreement on trade and services (Panizzon 2010), still being discussed by the WTO members, which will control – through the economy – the global management of the mobility of professionals, as an immediate and automatic response to signs from the market.

Conclusion

Everything leads us to believe that the mobility of skills is escalating and gaining pace today. We have entered the second phase of widespread circulation. The first was the convergence phase. Less developed countries have managed to embark on a process of catching up with knowledge intensive economies, thanks particularly to the dissemination of knowledge creation capacities via their diasporas.

These developments – that have resulted from migrations, among other things have changed the conditions of dual planetary asymmetry that used to shape mobilities. This differential of conditions and capacities is no longer the sole trigger for global mobility. Though it is partially true for many countries, it has become much more complex. New attractive poles are emerging and exchanges on the basis of complementarity and parity are increasing. This is a new phase, characterised by multipolar interdependence. It holds crucial stakes for sustainable develop-

ment. The first one relates to individual players whose movement should not just be a unilateral submission to professional pressures in unfavourable conditions. The second one relates to all kinds of groups, which try to construct endogenous development capacities over a period of time and whose efforts can be sustained or arrested depending on the forms these movements take. Migratory, educational, social, economic, scientific and technical policies should all respond to these stakes in a well-coordinated way after evaluating them. Mobility has not radically changed the latter; it has on the contrary modified their context and response conditions, calling for more cooperation and less belief in a universal plan.

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