

Brain Circulation and Knowledge Society in the Mediterranean Region¹

Ummuhan Bardak

Labour Market Specialist

European Training Foundation, Turin

Knowledge is recognised as a cornerstone of human development, a means of expanding people's capabilities and choices, increasingly a dynamic factor of production and a powerful driver of productivity and sustainable growth. The transformation of existing societal structures by knowledge as a core resource for economic growth, employment and as a factor of production constitutes the basis for designating advanced modern society as a '*knowledge society*'. The societal transformation is through large-scale development in education, healthcare, agriculture and governance, which in turn leads to employment generation, high productivity and rural prosperity. In this society knowledge diffusion, production and application become the organising principle in all aspects of human activity – culture, society, economy, politics and private life – and the older measures of competitiveness such as labour and capital are superseded by dimensions such as patents, research and development, availability of (or ability to afford) knowledge workers.

Social transformation together with globalisation has increased the mobility of human capital and high-skilled individuals as knowledge forms an integral part of the global economy. Mobility schemes have become an important part of tertiary education and professional work at both national and international levels. For the initiators of these programmes, mobility is a good thing. In parallel to this view, however, there is a darker perception of international mobility – its supposed effect of 'brain drain'. A sustained and substantial net outflow of persons from one country to another can threaten the

foundations of a country's science and innovation capacity and lead to concentration of economic activity abroad at the expense of origin countries. Recently such concerns have been additionally fuelled by the concept of knowledge society. Since the wealth and material well-being of a nation depends much more on its capacity to produce new knowledge and innovation today, to lose one's key knowledge producers is deemed as much more damaging in times of knowledge-based economies than in past agrarian societies.

The parallel existence of the high regard for internationalisation and international mobility and the fear of fostering brain drain appear contradictory, but results depend on a vast array of complex variables: temporary with occasional returns versus permanent migration, multi-directional instead of unilateral movement, and a global phenomenon affecting developed and developing countries alike. Thus the complexity of the flows prevents any simple conclusion. Certainly the conditions that govern mobility have changed dramatically, in terms of new forms of communication, transportation, geopolitics, intercultural relationships and commerce, and have lost some of the traditional features that led to brain drain. Increased ability to interact at a distance helps maintain umbilical links with regions of origin. The barriers of distance and space have been minimised in the information era, opening up a whole array of opportunities and challenges in the way people communicate, live and run daily activities.

With ever increasing quantity of high-skilled labour mobility and significant changes in migration patterns, a paradigm shift has occurred from '*brain drain*' to '*brain circulation*', defining the issue in terms of 'circulation' of skills and manpower, which has a major consequence for public policy, namely that the mobility

¹ The Mediterranean countries included in this analysis are Algeria, Egypt, Jordan, Morocco, Lebanon, Syria and Tunisia.

of high-skilled labour is seen as a normal process that should not be stopped, its real challenge being its management in the best possible way. This circulation model approaches migration in terms of an on-going process rather than single permanent moves but it also distinguishes the issue of knowledge transfer from the physical presence of the individual migrant (recognising that forms of transfer may take place in other ways). Although it does not exclude any types of migrants, the concept of brain circulation implies a special focus on the high-skilled and their contribution to knowledge exchange, dissemination and (scientific, technological and economic) networking between the centre and peripheral regions. Particularly higher education students, university lecturers, scientists, research and development personnel, business networks of innovative start-ups and other professionals working for multinationals are cited.

Brain circulation emphasises a more dynamic process of networking and linkages and positive aspects of compensation mechanisms to mitigate the disadvantages –such as expertise development, business contacts, scientific exchange and cooperation, co-authorship and transfer of technology. As shown by Saxenian (2002) in the case of Indian and Chinese expatriates at Silicon Valley, mobile experts have the potential to become catalysts for expanding knowledge, business and venture initiatives and enhancing the knowledge transaction across borders. They do not need to be financial investors; they can serve as 'bridges' by providing access to markets, sources of investment and expertise. Influential expatriates can shape public debates, articulate reform plans and help implement reforms and new projects with their policy expertise and managerial knowledge. They can link local producers more directly to the market opportunities and networks of more advanced economies, create new market incentives that profoundly affect the pace and direction of economic progress in both locations, and transfer not only technology and capital, but also managerial and institutional know-how to formerly peripheral regions. This article starts with an overview of educational systems in the Mediterranean region since human capital formation is the starting point of any discussion on socio-economic development and knowledge society. Highly educated citizens generate more benefits for themselves and for society, create a positive effect on work productivity, provision of key public services, tax revenues and constructive social and political debates. They constitute the core of the

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middle classes of their countries, demanding better public services and more transparent and democratic institutions. Then, it continues with a brief migration history of the region with a special focus on migrants' skills. The proportion of skilled emigrants is particularly relevant for its implications on brain circulation. Finally, it looks at the situation of returnees and diaspora networks regarding their potential for a circulation model between the south and north shores of the Mediterranean Sea.

An Overview of Regional Education Systems and the 'Knowledge Society'

Education has been a political priority in the Mediterranean region for the last five decades, attracting a significant public investment from governments driven by rapidly expanding youth populations and the need to build nationhood. With an average investment of 5-6% of the GDP, a significant increase in the literacy rates and the average educational attainment of the labour force have been achieved. Literacy improved dramatically in almost all countries from 1960 to 2007, more than doubling in every country that started with a low base. Among the population aged 15 years and above, the literacy rate in 2000 was 90% in Jordan, 87% in Lebanon, 75% in Syria, 65% in Egypt and 55% in Morocco. This was achieved by improving access to education and recording increases in the average number of school years per person. The overall weighted average of school years for the Arab region amounted to 1.1 years in 1960, which increased progressively to 4.83 years by 2000. In 2000, the average school years for the population aged 15 years and above were 6.91 years in Jordan, 5.77 years in Syria and 5.51 years in Egypt (ETF 2007).

As a consequence, the formal education indicators have been improving rapidly in these countries. With

few exceptions, most countries provide basic education for most children and opportunities for upper secondary, vocational training and tertiary education for many. By 1999, the net enrolment rate in Egypt was 96.94% in primary education, 74.3% in preparatory education and 65% in secondary education. In Algeria, the enrolment rates for primary school are about 94% for males and 92% for females. In Tunisia, 99.2% attended primary education in 2001. Morocco, in spite of raising the primary enrolment rate from 84.6% in 2000 to 91.6% in 2004, is still one of the worst cases in the region. Tunisia, Jordan and Lebanon are often mentioned among the better performers, while Morocco, Egypt and Syria are behind them on most indicators (Bardak 2006).

Despite the impressive educational expansion in the region, the coverage of the educational systems and the average attainment levels of education still lag behind compared with good examples of the developing world (e.g. Eastern Europe, East Asia, Latin America). This has potentially important consequences for knowledge society. Very low starting levels of education in the 1960s require continuing investment with significant financial costs since equal access to different levels of education by males and females, by rich and poor, and by urban and rural residents is still problematic, albeit to varying degrees among the countries. As literacy increases more rapidly in urban areas (Lebanon, Jordan and Tunisia), countries with very significant rural populations (Morocco, Egypt) have lower adult literacy rates – around and above 50%. A large proportion of dropouts include children from rural and poor families who are likely to join informal labour markets under economic hardships and poverty. In 1994, Moroccan net primary enrolment was 58% in rural areas and 85% in urban areas, and Tunisian secondary enrolment in rural areas was as low as 19% while in Tunis it was 78%. Literacy in the region is at least 20% lower among women, and females in predominantly rural countries are at a distinct disadvantage. Girls are less likely to be literate, to receive a secondary education and to reach university or higher vocational training in the region. Therefore, a continuing strong public sector commitment is necessary for the completion of universal access to compulsory education, reductions in dropout rates, higher completion rates and internationally competitive learning achievements. Due to high demographic pressure and continuous expansion in educational systems (with decreasing expenditure

per student), focus on access also overshadows the issue of quality. According to observers, the quality of education is neglected at the expense of expanding mass education and the most serious problem facing Arab education is its deteriorating quality at all stages of education. The crucial question for Mediterranean countries is how education can meet the challenges of knowledge society, which are more than traditional literacy and schooling rates. Educational systems must generate awareness in students concerning the requirements of knowledge economy including its values, attitudes and practices; ensure that this process is inclusive and does not further exploit marginalised classes; sound work ethics are instilled into new generations. Students – one of the key pools of human resources for developing countries – must acquire certain skills that are required by a modern economy (i.e. core competences, languages, digital literacy, etc) (UN 2003).

Evaluating the quality of education in the Arab world is difficult owing to insufficient information and data. In one of the few examples of standardised comparative measurements, ten countries of the region (Bahrain, Egypt, Iran, Jordan, Lebanon, Morocco, WBGs, Saudi Arabia, Syria, and Tunisia) took part in the 2003 Trends in International Mathematics and Science Study (TIMSS) together with 35 other countries of the world. The results showed that the proportion of students failing to achieve even the low benchmark in mathematics and science is 81% in Saudi Arabia, 71% in Syria, 58% in Morocco, 49% in Bahrain, 48% in Egypt, 45% in Tunisia, 40% in Jordan, and 32% in Lebanon. Similar national assessments also confirm that basic literacy and mathematics skills have deteriorated since the late 1980s in Egypt, and a declining performance in French and science has been reported in Morocco. There are also signs of high failure and repetition rates, leading to longer periods being spent at the different stages of education. In Algeria, the repetition rate in primary school reached more than 30% in the 9th year and 40% in the 3rd year of secondary education. In Tunisia it is about 16% in basic education and 16% in secondary education, and the drop out rate is about 10% in the lower secondary (Bardak 2006).

Recent pressures to expand higher education have also led to a significant decrease in the quality of education and research in universities. Strong demand for higher education in Jordan, for example, led to a dramatic increase in the number of students

enrolled in universities (from 31,049 in 1990/91 to 120,000 in 2001/02). While increase in enrolment can be viewed as a positive phenomenon, it can be argued that the quality of education has been compromised in most cases. Students face several problems within educational systems –overcrowded classes, inadequate libraries, poorly equipped laboratories, low quality and discouraged teachers and no student services. The wages of teaching staff, which are low, increase by seniority rather than by teaching abilities or research and publications. There is lack of coordination between universities, colleges and other technical training establishments, and some also mention an emerging duality in Arab education systems: an exclusive private education system enjoyed by the minority, and a lower quality public education system for the majority. There has been no analysis of skill needs and the limited interaction with the private sector in most countries.

As a result, while the number of graduates from the different stages of education is increasing, they lack in most cases the core competences and relevant skills needed in a knowledge economy. Since the benefits of education (especially higher education) are eroded by political factors, a diploma is considered more important than the learning outcome itself, and higher education is perceived as a means of achieving social status, rather than increasing the productivity of individuals. Favouritism and nepotism in the selection of individuals for education and employment significantly undermine the value of knowledge and productivity. In fact, the prevailing environment does not reward the acquisition of knowledge and creativity. With few exceptions, curricula and teaching methods in the region give high importance to memorising and rote learning without active learning techniques, and the teaching content remains information-based, not knowledge application oriented. Students do not develop a sense of initiative, critical analysis and a problem-solving attitude. The resulting memorisation without thought of the meaning is in strong contrast with the new trends in the global world that seek to cultivate in students creativity, self-initiated reasoning and critical thinking. By most indicators, regional education systems do not reward these skills, if not punish them (UNDP 2003).

Regarding scientific research and generation of knowledge, UN (2003) data pertaining to the mid-1990s reveal that gross expenditure on research and development (R&D) in the Arab world is marginal, amounting to approximately 0.4% of GDP, the lowest

figure in the world. The number of patents held by Arab nationals is negligible, and the scientific output of the Arab world (as measured by publications per million inhabitants) is low, amounting to 0.7% of world publications. Another problem is the growing mismatch between the excessive supply of tertiary graduates in the conventional fields of arts and humanities and the requirements of a fluid global economy: 72.7% of the 1998/99 university graduates in the region majored in these fields compared to 6% in science subjects,

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7.4% in medicine and 9.8% in engineering (UN 2003). This mismatch has been exacerbated by increasingly rapid innovations in the field of technology. In 2001, only 1% of the world Internet users were from the region and the corresponding penetration rate at that time of the personal computer was around 2%. High cost is the main obstacle to Internet access and telephone connections.

Regional Migration Patterns and 'Brain Circulation'

The Mediterranean region has been a source of labour emigration particularly to neighbouring labour markets during the last four decades. According to Bardak (2006b), 2.7 million Egyptians (around 10% of the country's labour force) live outside their country, 70% of which are in the Gulf countries, while most of the remaining 30% are in the USA, Canada, Italy and Australia. The number of Moroccan nationals abroad is around 3 million, 85% of whom live in Europe (France, The Netherlands, Belgium and Spain). Some 1.2 million Algerians and 850,000 Tunisians live abroad, the vast majority of which reside in Europe (mainly France). Around 900,000 Lebanese nationals have left the country for emigration since 1975, 10% of which live in Europe. The number of Jordanian migrant workers is around 400,000, concentrated in neighbouring countries of the region. Significant

numbers of Syrians emigrated to Europe, Africa and America in the first half of the last century, but recently around 500,000 Syrians have found employment in Lebanon and Jordan as unskilled and low-skilled seasonal workers.

The regional migration flows with different source countries, destinations and periods of migration were far from homogeneous in terms of origin (rural or urban), skill levels and nature (temporary or permanent). For example, Moroccan migration towards Europe was part of the livelihoods of poorer communities mostly from rural areas, while Egyptian migration also involved temporary movement of skilled individuals from urban centres (such as teachers during the 1970s) to the Gulf, Iraq and Libya. Large amounts of unskilled and low skilled migration took place from North Africa (Morocco, Tunisia and Algeria) to Europe (France, Belgium, the Netherlands and Germany) in the 1960s and 1970s through labour agreements to meet heavy industry needs and subsequent family unification schemes. The oil boom of the 1970s and 1980s provided intra-regional migration to the Gulf from Egypt, Jordan, Palestine and Lebanon. Jordanians and Palestinians generally were skilled workers and professionals, and Egyptian migrants spanned the entire spectrum of skill and occupation from manual labourers to advisors and managers. Despite the negative impact of the Gulf crisis and the changing composition of the Gulf labour markets, intra-regional worker movements still continue due to geographical, cultural and linguistic affinity.

An overall review of Arab migration history confirms the low proportion of skilled individuals in the total emigration stock, particularly where it concerned emigration to Europe (Adams 2003; Ozden&Schiff 2005). By and large, migration flows have been dominated by unemployed people from rural areas, decreasing the pressure of unemployment in stagnating economies and increasing earning capacity of individual migrants. However, recent global trends indicate increasing skilled labour flows from Egypt towards the USA, Canada and the UK; from Lebanon to the USA and Canada; from Iran to Germany; and from Maghreb to France (Bardak 2006b). University graduates represent 58% of the first generation migrants originating from the region in Canada and USA, against 10% in Austria, France, Germany, and Spain. 77% of recent Egyptian migrants have tertiary education, and the rate of scientists and technicians among emigrants increased from 20.4% in 1985 to 40.2% in 2002. The percentage of clerical workers

decreased to less than one fifth, and the probability of migrating to OECD countries among those who obtained tertiary education is five times higher than among those with primary education or less. Emigration of scientists from Algeria has been considerably accelerated during the last decade with no return perspective. The French National Centre for Scientific Research only includes 700 Moroccan, 500 Algerian, and 450 Tunisian researchers.

Increasing international student mobility (mainly through post-graduate studies) and training and exchange programmes of professionals provide the seeds for future international skilled migration, but limited tracer studies are available on the Arab students. For example, a new form of emigration concerns graduates of some high performance engineering schools in Morocco, where 50 to 70% of best graduates travel abroad. Significant numbers of Syria's educated elite have emigrated since 1970, only 20% of whom returned home after obtaining a PhD at a foreign university. Maghrebi qualified labour is rather more concentrated in France, where 58% of all foreign students come from Morocco, Algeria and Tunisia and only half of those who completed their PhD or post-doctorate studies return to their country of origin. A survey of Moroccan engineering students at French institutes in 1999 revealed that 88.7% do not think of returning to Morocco. Reasons cited include the archaic character of mentalities (64.3%), lack of transparency of social and economic rules (32.5%), lack of viable and attractive work and research opportunities (13.3%), low salaries (11.6%) and other issues related to the quality of life and work, such as freedom, security, work ethics, quality of public services, etc (Arab League 2003).

As seen from the responses, the material factor is not the main determinant for the majority and skilled migration from the region that is not explained only with economic arguments. The main determinants are the general environment which doesn't sufficiently appreciate knowledge and competences, a lack of freedom and transparency in the administration of careers, difficult work conditions, and a scarcity of interesting and valuable job opportunities. This population is particularly sensitive to the frustrations associated with work and business, bad governance and complex bureaucratic restrictions, corrupt and/or unresponsive officials, low standards of living, poor public infrastructure (poor education and health services, unreliable power supplies, water shortages, costly telecommunication facilities, dangerous

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highways etc). Increasing permanent migration of the skilled from the region may partly illustrate the failure of the state, universities and private sector in keeping human capital in their countries or treating them as potential political and economic competitors, a perceived threat to their privileged position at home, leading to the departure of the unwanted elite.

‘Brain Circulation’ through Returnees and/or Diaspora Networks

Returnees may bring new ideas, knowledge and skills, networks, savings, entrepreneurial and political ideas, but there must be something to return to, a stable environment which makes it an attractive and viable option for skilled expatriates. Arab migrants are mainly affected by the destination and intended duration of migration in return decisions. While migration to OECD countries shows a more permanent feature, migration to the Gulf is mostly temporary and includes a higher degree of mobility. This is related to different costs and opportunities in destination countries and to the lack of attractiveness of home countries. There were some Lebanese entrepreneurs, professionals and skilled workers who returned and contributed significantly to the development of their country in the early and mid-1990s, but many had to leave again. Studies on Tunisian and Moroccan migrants reveal the following constraints preventing their return: lack of attractive jobs, weakening or loss of contacts, inefficient public services (education, health, transport), excessive administrative procedures, social and political control, scarcity of investment opportunities and difficulty of access to credits. As a result, particularly in Europe,

the majority of Arab migrants settled down in the host countries, constituting large second and third generation communities².

Diaspora can also play a crucial role in business development, foreign direct investment, technology transfer, philanthropy, tourism, research and development projects, being agents for more intangible flows of knowledge, technology, know-how, new attitudes in culture and politics, hybrid identities and social capital from host to origin countries. However, their ability to contribute is conditioned by the integration level in host countries. No contribution can be expected from communities suffering from daily survival concerns (illegal status, precarious jobs, low education). Therefore, the notion of ‘*diaspora networks*’ is different from diasporas – a totality of individuals living abroad that are composed of very heterogeneous members, some constructive and useful and others dividing and alienating. Skilled diaspora networks and successful intellectual expatriates may constitute a powerful means of benefiting from emigration through exchange of knowledge and useful contacts.

The Arab diaspora in Europe often reproduces the divisions of class, ethnicity, religion, political affiliation, language and region that are found in origin countries, reducing the influence and scale of their capacity and willingness to contribute to their society. The social interaction between host societies and the majority of Arab migrants is not always successful and sharing wealth but not identity with the host societies creates serious integration problems. Their social exclusion reinforces ethnic and religious identities and prevents the emergence of new combinations of social norms and values in these communities. Diaspora relations with the public authorities of the home country are not easy either. The position of Arab governments on their expatriates has been reactive rather than proactive and the institutions created to deal with migrants have not been effective in addressing their real needs. Political issues have sometimes weakened and even inflamed the bond between the diaspora and their home countries, leading to avoidance by migrants of active participation and contribution (Bardak 2006b). The case of Egyptian migrants illustrates well the uneasy relationship with public authorities in Egypt. They tend to avoid participating in initiatives promoted by the

² Tight migration policy and travel restrictions implemented by European countries may have contributed to the permanent settlement of migrants who had to make a choice between the country of residence and the country of origin. By choosing to stay in the country of residence, psychologically they still keep the return option open, maximising their opportunities with a rational reasoning, while they would have lost all the rights gained in the country of residence if they had permanently returned home.

government for them due to the bureaucracy and rigidity involved. Government interventions are perceived as an intrusion into their livelihood strategy; and most Egyptian expatriates have little interest in diaspora networks and collective mobilisation of resources for their country. The positive role of diaspora is partly exemplified by the Lebanese who easily integrate in their new environment and quickly move up to the middle and upper socio-economic classes of host societies. Strong attachment of Moroccans and Tunisians to their home countries is also illustrated by continuous investment in real estate and a high participation of the second and third generation descendants in local and national solidarity projects. Some Maghrebi migrants have become even successful entrepreneurs who manage a network of enterprises both in Maghreb and France; others have established French companies' affiliations abroad, keeping their legal and regular status in the host country (Arab League 2003).

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Limited evidence confirms that a majority of Arab migrants reflect the low level of human capital in their home countries. A weak professional profile, low education and income, poor integration and networking in host societies, lack of social and financial capital and weak institutional mechanisms in home countries are obstacles for a circulation model. However, following the first generation of unskilled and low-skilled migrants, there are modest signals indicating improvements in Arab residents' profiles in Europe. Though a minority, they may be found in many universities, at the heads of enterprises for import-export, transport, tourism, information and services, while others manage different branches of manufacturing such as clothing, foodstuff, carpentry and construction material. The impact of these better profiled and integrated emigrants remains to be seen in the longer-term. Whether as returnees or diasporas, these people have the potential to develop transnational and entrepreneurial links between home and host societies only if a dynamic interaction between diaspora communities and their host societies occurs. What is needed is a framework that allows their social, economic, financial and political inclusion in the host

countries, without impeding the emotional, cultural, economic and social attachment to home countries.

Conclusion

Understanding the dynamics between education, knowledge society, migration and brain circulation is difficult due to complexity of the interactions and multiplicity of variables. Unlike the majority of traditional migrants who remain isolated in marginal, low-wage industries and trade/services, educated professionals/entrepreneurs have higher potential to create dynamism through the emergence of transnational communities linking the centre (host country) to the periphery (home country) and/or their eventual return. However this requires a critical mass of expatriates who are transformed with experience and interaction, the ability to operate in two countries simultaneously, quickly identify market opportunities, locate foreign partners, and manage cross-border business operations. In this way migrants can be an opportunity to set up all kinds of links between the host and the home country, thus not necessarily "burning the vessels" with one side. In the case of low-skilled migrants, brain circulation dynamics is a gradual step-by-step process requiring ingenuity and creativity to trigger the process. Remittances seem to be the simplest and least sophisticated level of economic ties between sending and receiving countries.

While the strength and magnitude of the talent abroad is important, the capacity of home country institutions to use this is also critical. Attracting and keeping in contact highly motivated, highly qualified and successful professionals while providing mobility opportunities to expand knowledge and research skills is a big challenge for origin countries. They may fail to create attraction for them or do not even recognise it as an opportunity. Expatriates can open doors and make connections, but the government and the private sector of home country are crucial to take opportunities. Weakness of home country institutions and capture of governments by special interests prevent the dynamics to harness the potential of skilled expatriates (discouraged professionals by non-transparent career progress, ill-mentality about knowledge, research and curiosity of returnees). Therefore, the outcome depends on the political and economic environment of the home country which either encourages their expatriates to take part or tries to contain them.

In conclusion, more information is needed on the movements of high-skilled people in the Euro-Mediterranean area to develop specific policies that can turn the loss of talent into an exchange of knowledge (encouraging more beneficial and temporary migration flows). Geographical proximity may enable brain exchange more easily with an increasing openness of the European Research Area to South-North cooperation. The European Commission speaks of brain circulation whereby high-skilled people would work in Europe for a temporary period, be trained further and then return home with new skills and experiences (COM 2005-0390). EU mobility programmes such as Erasmus and Tempus can contribute to such networks in the long run. Special measures for recirculation of brains (a permanent visa that lets foreign graduates from Western universities move to and from the home country) may be developed. More active EU support to increase the quality of Mediterranean education and research systems may be helpful. Finally, the inclusion of these countries in the EU Copenhagen and Bologna Processes would provide cooperation framework for improving quality, transparency and recognition of qualifications in education systems.

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