

UNCTAD/LDC/2007

UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT
Geneva

THE LEAST DEVELOPED COUNTRIES
REPORT, 2007

Chapter 4



UNITED NATIONS
New York and Geneva, 2007

Addressing the International Emigration of Skilled Persons

Chapter

4

A. Introduction

The human capital endowment of an economy is a fundamental determinant of its long-term growth performance, of its absorptive capacity and of its performance in technological learning. It is an essential precondition for the development of domestic firms' technological effort. It is also a requirement for the effective working of trade, foreign direct investment, licensing and other channels as means of technology diffusion (Mayer, 2001; Kokko, 1994). Indeed, the movement of persons possessing a particular type of knowledge has traditionally been identified as a means of technology diffusion. It therefore appears alongside international flows of goods, investment and disembodied technology (analysed in chapter 1 of this Report) as a channel for technology transfer.

The movement of skilled persons may take place both within countries (e.g. among different firms) and internationally. The second case refers to both temporary movement of qualified persons (e.g. international technicians or consultants on short-term assignments) and permanent (or long-term) migration of skilled persons.¹ Those two forms of international flows are channels for the international transfer of knowledge, but are of different kinds. The short-term movement of professionals occurs mostly in the context of market-based transactions by firms seeking to acquire qualified services from other countries or to send them to other countries. Migration of skilled persons, by contrast, has different determinants, longer-term consequences and policy implications for countries of origin and for countries of destination. Countries may either gain or lose from those flows: international permanent (or long-term) immigration of skilled persons in principle contributes to building countries' skills endowment, while international permanent (or long-term) emigration of qualified persons entails (at least immediately) a loss in a country's stock of human capital. Those two processes are commonly referred to as "brain gain" and "brain drain" respectively. The circulation of qualified persons in any direction is termed "brain circulation". The most important issue for countries' long-term development is the net effect of migratory flows.

Least developed countries have a low skill endowment. Therefore, the international migration of skilled persons from and to those countries can have a strong impact on their human capital stock. This chapter discusses trends in international migration of skilled and professional workers from LDCs and endeavours to assess its consequences for those countries' brain drain and brain gain. It does not aim at an overall discussion of migration and its social and economic effects on LDCs. Rather, its main focus is to evaluate the impact of international migration of qualified professionals on the absorptive capacity of LDCs, so as to make policy recommendations regarding how to mitigate possible negative consequences of that type of migration or, possibly, how to make those flows contribute positively to the national knowledge system of LDCs.

The analysis is based on lifetime migration data for OECD countries. Skilled emigrants are proxied by the number of tertiary educated persons born in LDCs

Countries may either gain or lose from the movement of qualified people: international permanent immigration of skilled persons contributes to building countries' skills endowment, while international permanent emigration of qualified persons entails a loss in a country's stock of human capital.

LDCs have a low skill endowment. Therefore, the international migration of skilled persons from and to those countries can have a strong impact on their human capital stock.

For many decades supply and demand forces in origin and destination countries have combined to increase the migration of skilled workers from LDCs to developed countries and higher-income developing countries.

The economic situation of most LDCs has generally entailed limited employment opportunities for professionals and/or poor working conditions and career paths.

Demand pressure for increased deployment of skilled migrants from developing countries (including LDCs) has increased in industrialized countries.

and living in those developed countries. The skilled emigration rate is that figure as a share of the stock of tertiary educated persons in source countries in 1990 and 2000 (Manning, 2007). However, the increasing proportion of skilled workers migrating on temporary contract to developed and other developing countries is not covered here.² Furthermore, the discussion does not address South–South migration because it is less relevant for the migration of skilled persons. Although movements of persons among developing countries account for about half of all migration flows (Ratha and Shaw, 2007), they consist mostly of unskilled persons (except for Southern Africa and South-East Asia). By contrast, an estimated 90 per cent of international skilled migration flows were to OECD countries in the 1990s.

B. Causes and consequences of emigration

1. MAIN CAUSES

For many decades supply and demand forces in origin and destination countries have combined to increase the migration of skilled workers from LDCs to developed countries and higher-income developing countries. Slow economic growth and political instability, especially in parts of Africa, led to an increase in cross-border movements of professionals during the 1970s and 1980s, both to developed countries and to more rapidly growing neighbouring States (Russel, Jacobsen and Stanley, 1990). That migration supply pressure continued in subsequent years and into the new century, underpinned by economic, political and social conditions in source countries, as well as military conflicts in some cases. The economic situation of most LDCs has generally entailed limited employment opportunities for professionals and/or poor working conditions and career paths. Other factors are the low level of pay and the huge and widening gap between earnings in LDCs and those in developed countries or more advanced developing countries for the same careers. In contrast, economic growth and the creation of employment opportunities for educated manpower in LDCs appear to be closely associated with slower rates of brain drain (Lucas, 2004). Since that favourable situation has not been generalized in those countries, supply forces for emigration of skilled persons from many LDCs have remained strong in the past two decades.

At the same time, demand pressure for increased deployment of skilled migrants from developing countries (including LDCs) has increased in industrialized countries, despite their rapidly rising numbers of tertiary graduates. Opportunities for work among professionally qualified immigrants in developed countries have accelerated since the 1990s. More open policies were related to increasing shortages of skilled manpower, as a result of demographic and structural change. The major labour-importing economies, particularly the United States, the EU and its member States, Canada and Australia, have reacted in different ways to increase the supply of skilled manpower by attracting workers from abroad.³

While skill shortages have been experienced across the board in many increasingly technologically advanced developed countries, three sets of factors have been especially important in influencing renewed demand for skilled manpower. First, the ageing of developed country populations, especially in Europe and later in Japan, has contributed to slow growth in labour supply and increased demand for skill-intensive non-tradable services, particularly in health and old-age care. Second, the information technology revolution has greatly

increased the demand for skilled manpower in the production of computer software and the demand for computer and ICT engineers. Third, shortages of lower- to middle-level skilled manpower — technicians, electricians, plumbers, nurses and teachers — have been especially marked, as developed country workers shun difficult blue-collar and related jobs, and the output of their educational institutions has failed to keep pace with demand.

2. IMPACTS OF EMIGRATION ON DEVELOPMENT

The net impact of the migration of skilled persons in terms of the brain drain and brain gain of origin countries has not been clearly determined in the theoretical and empirical literature. A range of factors have been identified as important: the rate of economic growth and utilization of skilled persons back home, especially in certain skilled occupations (particularly relevant to the LDCs); the size of the brain drain relative to the domestic supply of skilled persons; the role of remittances; and the extent to which migration stimulates development of human capital in countries of origin (which is partly determined by the scale of out-migration and the role of the diasporas).

Early theoretical studies focused on the short-run impact of a loss of human capital, the cost of which is mostly borne by domestic taxpayers, and the impact of the decrease in the supply of educated persons on national output (Grubel and Scott, 1966; Bhagwati and Hamada, 1974). Subsequent research regarding the impact of out-migration of skilled persons on countries of origin can be divided into two groups: the findings of the migration “optimists” and the findings of the migration “realists”.

“Optimistic” models stress the dynamic effects of migration (e.g. Stark, 2004, and Mountford, 1997). They highlight the positive impact of remittances,⁴ and the impact on human capital development in home countries, as a result of increased demand for and access to education among those left behind. The scope broadened to include technology and knowledge transfer and other benefits of brain circulation, and the potential benefits deriving from diaspora links. Docquier and Rapoport (2004: 27) summarize the main effects of the successful experience of migrants abroad: “successive cohorts adapt their education decisions, and the economy-wide average level of education partly... or totally catches up, with a possible net gain in the long run” and “the creation of migrants’ networks that facilitate the movement of goods, factors and ideas between migrants’ host and home countries”. The diaspora reduces the costs of migration and risks in countries of destination, providing greater incentive and demand for migration-linked education at home (Kanbur and Rapoport, 2004, cited in Docquier and Rapoport, 2004). It must, however, be pointed out that the existence of a positive impact on countries of origin rests on the assumption that a significant number of graduates of new courses and new schools, who initially enrolled with the aim of going abroad, end up contributing to the provision of a higher value of goods and services to the domestic economy.

At the same time, dynamic effects associated with brain circulation have received increasing attention. More attention in the empirical literature has been paid to the role of return migrants in raising skill levels, and promoting technology transfer and capital accumulation, especially in the successful growth cases of East and South Asia since the 1990s (Saxenian, Motoyama and Quan, 2002).⁵

The above-mentioned relationships are complicated, however, especially since theoretical models fail to take account of a number of factors: migration “realists” have focused on differences in the quality of out-migrants and return

The net impact of the migration of skilled persons in terms of the brain drain and brain gain of origin countries has not been clearly determined in the theoretical and empirical literature.

The short-run cost, a loss of human capital, is mostly borne by domestic taxpayers, and the impact of the decrease in the supply of educated persons is reflected in national output.

“Optimistic” models stress the dynamic effects of migration on remittances, technology and knowledge transfer and diaspora links.

Box 7. The importance of remittances

Remittances have increased dramatically in recent years, totalling an estimated \$167 billion in 2005, according to World Bank estimates. They have grown faster than foreign direct investment and official development assistance over the past decade, doubling in several countries and increasing by close to 10 per cent per annum between 2001 and 2005 (World Bank, 2006). Their major role in receiving countries is to stimulate consumption and investment in those countries, help relax foreign exchange constraints and contribute to poverty alleviation (Adams, 2007). Their contribution to development depends on their macroeconomic impact and how they are used in receiving countries. There is evidence that they are more directed to consumption than investment, which perhaps explains why no link between them and long-term growth has been found (IMF, 2005: chapter 2).

Although remittances arise from both skilled and unskilled emigration, their effects just mentioned appear to be stronger in cases where unskilled migration predominates, as compared with situations where skilled migration predominates. Qualified emigrants have higher earnings abroad than unskilled ones, but are more likely to become permanent immigrants with weaker links to countries of origin; eventually, this leads to smaller remittances (Faini, 2006; Niimi and Ozden, 2006).

Box table 2 presents data on remittances over the period between 1990 and 2005 for a collection of LDCs for which data appear to be plausible.¹ On average, excluding a number of extreme values in the calculation of changes over time, remittances per capita appear to have increased quite significantly in LDCs in the 1990s and even more in 2000–2005. The mean value doubled from \$284 million in 1990 to an estimated \$621 million in 2005. Remittances are highly correlated with total rates of emigration to OECD countries and out-migration rates among skilled workers (for both there was a correlation coefficient of 0.79 between the value of remittances and migration rates in 2000).

Box table 2. Value of remittances and remittances per capita, least developed countries and selected countries with high rates of emigration, 1990–2005

| Country group/Country | Value of Remittances (Current \$ millions) | | | Remittances (% increase) | | Value of Remittances (Per capita in current \$) |
|---------------------------------------|---|------------|-----------------|-----------------------------|-----------|--|
| | 1990 | 2000 | 2005 (estimate) | 1990–2000 | 2000–2005 | 2004 |
| Africa and Haiti | | | | | | |
| Sudan | 62 | 641 | 1 403 | 934 | 119 | 43 |
| Haiti | 61 | 578 | 919 | 848 | 59 | 107 |
| Senegal | 142 | 233 | 511 | 64 | 119 | 45 |
| Lesotho | 428 | 252 | 355 | -41 | 41 | 153 |
| Uganda | | 238 | 291 | | 22 | 11 |
| Mali | 107 | 73 | 154 | -32 | 111 | 13 |
| Togo | 27 | 34 | 149 | 26 | 338 | 28 |
| Benin | 101 | 87 | 84 | -14 | -3 | 12 |
| Asia | | | | | | |
| Bangladesh | 779 | 1 968 | 3 824 | 153 | 94 | 23 |
| Yemen | 1 498 | 1 288 | 1 315 | -14 | 2 | 52 |
| Nepal | | 111 | 785 | | 607 | 34 |
| Cambodia | | 121 | 138 | | 14 | 10 |
| Island States | | | | | | |
| Cape Verde | 59 | 87 | 92 | 47 | 6 | 197 |
| Samoa | 43 | 45 | 45 | 5 | 0 | 249 |
| Comoros | 10 | 12 | 12 | 20 | 0 | 20 |
| Vanuatu | 8 | 35 | 9 | 338 | -74 | 43 |
| Kiribati | 5 | 7 | 7 | 40 | 0 | 76 |
| Total | | | | | | |
| Average | 284 | 366 | 621 | 29 | 70 | 53 |
| Average without outliers ^a | | | | 12 | 64 | |
| India | 2 384 | 12 890 | 21 727 | 441 | 69 | 20 |
| Mexico | 3 098 | 7 525 | 18 955 | 143 | 152 | 175 |
| Philippines | 1 465 | 6 212 | 13 379 | 324 | 115 | 141 |
| Colombia | 495 | 1 610 | 3 668 | 225 | 128 | 70 |
| Jamaica | 229 | 892 | 1 398 | 290 | 57 | 528 |

Source: UNCTAD secretariat calculations based on Global Economic Prospects data set (World Bank), 2006, for remittances; and UNCTAD, GlobStat database for population.

a Sudan, Haiti and Vanuatu.

These figures are significant in terms of foreign exchange earnings for a large number of countries, apart from the major oil and mineral exporters, given that total merchandise exports were less the \$500 million per year for the large majority of LDCs

Box 7 (contd.)

(UNCTAD, 2006: chart 1). For example, estimated remittances of nearly \$4 billion in Bangladesh in 2005 were greater than the total value of merchandise exports of \$1.4 billion in 2003–2004; among the smaller exporters — for example, Lesotho, Uganda and Senegal — an amount totalling approximately \$200 million was equivalent to or greater than total exports in the same years. Among two very small countries — Cape Verde and Samoa — remittances of \$92 million and \$45 million, respectively, were the major source of foreign exchange. It is noteworthy that Senegal, Cape Verde and Samoa all had emigration rates of 20 per cent or more (69 per cent for Cape Verde) in 2000, and hence skilled out-migration probably played a major role in remittance incomes.

¹ The data need to be interpreted with care, given that the reliability of coverage appears to differ significantly for individual countries from year to year.

Box 8. Return migration

There is little quantitative information about the contribution of return migrants to skill formation and technology back home among LDCs. Nevertheless, limited studies in similar economies show that return migrants can make a difference in terms of the skills endowments of origin countries. Ammassari (2003: 2) concludes from a study of skilled returnees in Côte d'Ivoire and Ghana that they “fostered positive development effects in both private and public sectors”. This differed across generations, with earlier return migrants assisting in “nation building”, while the contribution of later cohorts was more directly related to entrepreneurship. Among the benefits which returnees themselves cited as most important, specialized technical expertise and communication skills ranked highest. Knowledge and skills were more important than work experience, although contributions to work morale and productivity in new jobs were also ranked quite high. In addition to technical expertise, returnees brought modest amounts of capital with them (reported to be less than \$10,000 for over half of respondents in both countries), and mainly used them for housing and consumption of durable goods, although about one third also reported providing assistance to family members. Therefore, the main contribution of returnees in low-income countries seems to be their skills and human capital, rather than investment in the home country. It is likely that the same is the case in LDCs.

migrants, compared with their (potential) replacements back home and on the extent to which skilled migrants are employed in skilled occupations abroad (Docquier and Rapoport, 2004; Lucas, 2004). Several of those factors have been identified as reducing potential gains from brain circulation and remittances from skilled and professional persons in many LDCs.

Many studies have focused on the migration premium — a range of 2–10 times higher earnings among migrants compared with non-migrants in the same occupations, according to Docquier and Rapoport (2004) — while paying less attention to the costs of migration, both psychological and social, as newcomers seek to assimilate in new environments. One important finding about the jobs undertaken by educated migrants suggests that many work in less skilled jobs, and thus experience brain “waste”. In such cases, the migration of educated persons is not necessarily a stimulus for education in countries of origin, or may be a stimulus for learning skills which do not replace those that are lost (for example, doctors retraining to become nurses in the Philippines).

Impacts on human capital in places of origin are likely to be varied and larger in low-human-capital and low-migration contexts, either through return migration or remittances, than where an abundant supply of educated persons and substantial out-migration already exist (Docquier and Rapoport, 2004). Short-run brain drain effects are likely to be greater in countries with a narrow human capital base.

Heterogeneity among migrants and non-migrants is also an important issue. Schiff (2006) has drawn attention to the fact that the more optimistic models of migration tend to ignore self-selection, which results in higher-quality persons going abroad. For those migrants there are not near-perfect substitutes among the remaining stock of skilled or potential persons. It has also been noted that the

Studies about the jobs undertaken by educated migrants suggests that many work in less skilled jobs, and thus experience brain “waste”.

Short-run brain drain effects are likely to be greater in countries with a narrow human capital base.

less successful skilled migrants tend to return home, and hence the brain gain is smaller than some of the theoretical models predict.

More settled migrants tend to have more tenuous links with home countries and their remittances tend to decrease in time.

3. IMPLICATIONS FOR THE LDCs

According to Docquier and Rapoport (2004: 34), while the optimal rate of skilled and professional out-migration “is likely to be positive”, whether the “current rate is greater or lower than this optimum is an empirical question that must be addressed country by country”. There appears to be huge variation in individual country experience with respect to brain drain, brain circulation and brain gain. One important factor is the size of the brain drain, which has both positive and negative effects: a large diaspora provides a cushion and a support for would-be skilled migrants, but at the same time may reduce the potential benefits to countries of origin over time. More settled migrants tend to have more tenuous links with home countries and their remittances tend to decrease in time.

Industries that employ emigrants also play a part in determining the benefits. The out-migration of doctors and nurses in a largely non-tradable and heavily regulated industry (despite the internationalization of health care service provision in some countries) might be expected to have few benefits for home countries in terms of technology transfer, investment from abroad and, of course, trade. Benefits can be expected to be much more positive in a highly open, tradable industry such as ICT, where economic benefits provided by nationals working for private investors abroad can be substantial for technology, employment and investment in countries of origin.

Home country policies and growth prospects can play a major role in increasing brain gain and reducing the costs of brain drain. Rapidly growing middle-income countries that have passed the migration “hump”⁶ are likely to be in a better position to utilize skilled persons from abroad and to invest in the human capital that is necessary for filling the gaps created by emigrants. But even at lower levels of per capita income, domestic policies appear to be important.

Data suggest that skilled out-migration from developing countries increased sharply in the 1990s and was the highest in LDCs.

C. Skilled emigration trends and developments

The latest data on the total number of skilled out-migrants are from the round of censuses conducted in 1990 and 2000 in OECD countries, which are host to a high proportion of all skilled migrants. The data suggest that skilled out-migration from developing countries increased sharply in the 1990s.⁷ While the total OECD population expanded by less than 20 per cent in the 1990s, skilled immigration increased by some two thirds (12 to 20 million). The patterns are documented by Docquier and Marfouk (2006). Table 30 summarizes several of the main findings of that study:

The share of skilled migrants was negatively correlated with the level of development.

- Skilled out-migration rates were inversely related to country size.
- Rates of skilled out-migration were highest in LDCs (13 per cent). Nevertheless, LDCs accounted for only less than 5 per cent of all skilled migrants, while middle-income and high-income country groups accounted for close to 30 per cent each.
- The stock of skilled persons was positively related to the level of economic development, as might be expected. However, the share of skilled migrants was negatively correlated with the level of development.

Table 30. Rates of emigration for all workers and skilled workers among LDCs and other country groups, 2000*(Percentage)*

| | Rate of emigration | | Share of skilled workers | | Share of migrants |
|------------------------------------|--------------------|-------------|--------------------------|----------------|-------------------|
| | Total | Skilled | Among residents | Among migrants | |
| By size | | | | | |
| Large (pop. >25 million) | 1.3 | 4.1 | 11.3 | 36.4 | 60.6 |
| Intermediate (pop. 15-<25 million) | 3.1 | 8.8 | 11.0 | 33.2 | 15.8 |
| Smaller (pop. 2.5-<15 million) | 5.8 | 13.5 | 13.0 | 33.1 | 16.4 |
| Small (pop. <2.5 million) | 10.3 | 27.5 | 10.5 | 34.7 | 3.7 |
| Total | | | | | 96.5 ^a |
| By income | | | | | |
| High-income | 2.8 | 3.5 | 30.7 | 38.3 | 30.4 |
| Upper-middle income | 4.2 | 7.9 | 13.0 | 25.2 | 24.3 |
| Lower-middle income | 3.2 | 7.6 | 14.2 | 35.4 | 26.6 |
| Low-Income | 0.5 | 6.1 | 3.5 | 45.2 | 15.1 |
| Total | | | | | 96.4 ^a |
| Least developed countries | 1.0 | 13.2 | 2.3 | 34.0 | 4.2 |

Source: Docquier and Marfouk (2004, 2006).
a Total sums to slightly less than one hundred because of rounding.

These data on skilled (tertiary educated) migration flows provide no breakdown by industry/occupation and level of schooling. Thus out-migration is much higher in certain professions that are skill-intensive and where skills are relatively uniform internationally, such as medicine. Moreover, migration of highly educated persons with more than basic tertiary training tends to be much greater than for the tertiary educated population as a whole. Lowell, Findlay and Stewart (2004) cite studies which suggest that as many as 30–50 per cent of the developing world's population trained in science and technology live in the developed world. This has a direct impact on those countries' skills base, on their absorptive capacity and on their technological catch-up possibilities.

Tables 30 and 31 provide information on the rates of emigration for all emigrants and tertiary educated emigrants, as well as on changes in those rates during the period 1990–2000 for all LDCs for which data are available.⁸ To facilitate interpretation, the data are organized by regions.⁹ Within regions, countries are ranked by total population size (table 31), which is correlated with the absolute number of emigrants, although not necessarily with migration rates.

Three main patterns of skilled emigration and changes in emigration rates in the period 1990–2000 among the LDCs stand out. First, emigration rates were generally high among tertiary educated persons by international standards, with an unweighted mean for those countries of 21.4 per cent in 2000. That was much higher than for all lower-middle and low-income countries (7.6 and 6.1 per cent respectively in table 30), although the latter figure (weighted) is heavily influenced by quite low out-migration rates for China and India. There was considerable variation in the (unweighted) total rates of emigration among tertiary educated persons within and by country group among the LDCs. They were close to 25 per cent in the island LDCs, West Africa and East Africa, and lowest in the generally more populated Asian LDCs (6.4 per cent), with Central Africa falling in between (14.1 per cent).

Second, these average rates of emigration of skilled persons across the main LDC regions conceal very substantial intraregional variations, with coefficients of variation close to 1 in all regions except East Africa. All regions, especially West and East Africa, show substantial variations in rates across countries in both 1990

Out-migration is much higher in certain professions that are skill-intensive and where skills are relatively uniform internationally, such as medicine.

Migration of highly educated persons with more than basic tertiary training tends to be much greater than for the tertiary educated population as a whole.

As many as 30–50 per cent of the developing world's population trained in science and technology live in the developed world.

Table 31. Brain drain from LDCs to OECD countries, 1990 and 2000
(Percentage)

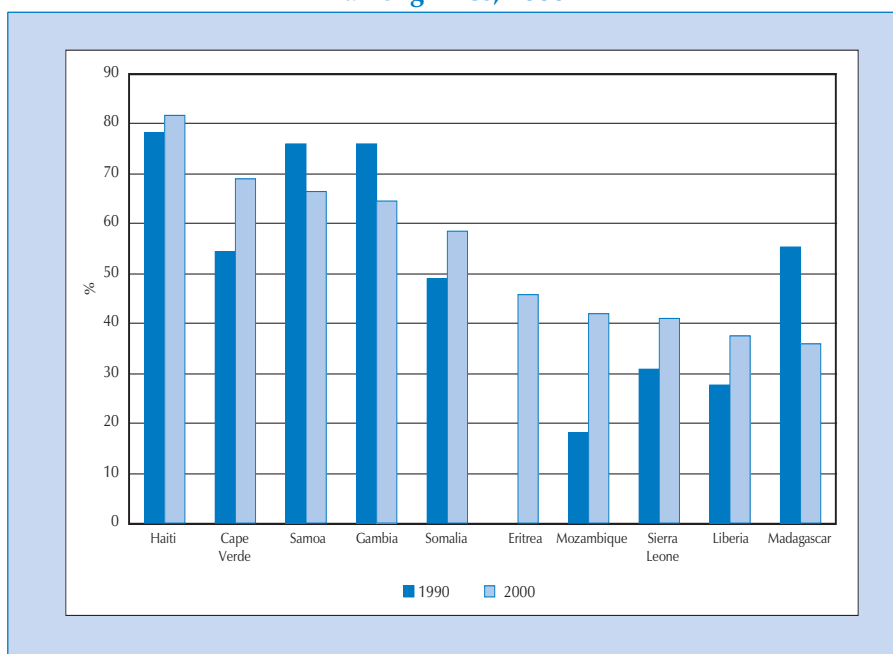
| Country group/ Country | Rate of out-migration | | | | Increase in out-migration rate | |
|------------------------------|-----------------------|-------------------|-------|-------------------|--------------------------------|-------------------|
| | 1990 | | 2000 | | 1990–2000 | |
| | Total | Tertiary educated | Total | Tertiary educated | Total | Tertiary educated |
| | (A) | (B) | (C) | (D) | (C-A) | (D-B) |
| Africa and Haiti | | | | | | |
| <i>Central (and North)</i> | | | | | | |
| Democratic Rep. of the Congo | 0.3 | 8.3 | 0.3 | 7.9 | 0.0 | -0.4 |
| Sudan | 0.1 | 5.0 | 0.2 | 5.6 | 0.1 | 0.6 |
| Angola | 2.7 | 7.1 | 2.7 | 25.6 | 0.0 | 18.5 |
| Chad | 0.1 | 8.7 | 0.1 | 6.9 | 0.0 | -1.8 |
| Central African Republic | 0.2 | 4.4 | 0.2 | 4.7 | 0.0 | 0.3 |
| Equatorial Guinea | 0.2 | 4.3 | 4.1 | 34.1 | 3.9 | 29.8 |
| Average | 0.6 | 6.3 | 1.3 | 14.1 | 0.7 | 7.8 |
| <i>West (and Haiti)</i> | | | | | | |
| Burkina Faso | 0.1 | 2.6 | 0.2 | 3.3 | 0.1 | 0.7 |
| Mali | 0.7 | 6.6 | 0.7 | 11.5 | 0.0 | 4.9 |
| Niger | 0.1 | 8.3 | 0.1 | 6.1 | 0.0 | -2.2 |
| Senegal | 1.6 | 11.1 | 2.6 | 24.1 | 1.0 | 13.0 |
| Guinea | 0.3 | 5.1 | 0.5 | 11.1 | 0.2 | 6.0 |
| Haiti | 7.3 | 78.3 | 10.2 | 81.6 | 2.9 | 3.3 |
| Benin | 0.2 | 6.1 | 0.3 | 7.5 | 0.1 | 1.4 |
| Sierra Leone | 0.5 | 31 | 1.4 | 41 | 0.9 | 10.0 |
| Togo | 0.5 | 8.9 | 1.0 | 13.6 | 0.5 | 4.7 |
| Liberia | 1.1 | 27.7 | 2.6 | 37.4 | 1.5 | 9.7 |
| Mauritania | 0.6 | 3.5 | 1.4 | 23.1 | 0.8 | 19.6 |
| Gambia | 1.3 | 76 | 3.1 | 64.7 | 1.8 | -11.3 |
| Guinea-Bissau | 0.8 | 5.9 | 1.8 | 29.4 | 1.0 | 23.5 |
| Average | 1.2 | 20.9 | 2.0 | 27.3 | 0.8 | 6.4 |
| <i>East (and South)</i> | | | | | | |
| Ethiopia | 0.4 | 13.9 | 0.5 | 17.0 | 0.1 | 3.1 |
| United Rep. of Tanzania | 0.3 | 14.8 | 0.3 | 15.8 | 0.0 | 1.0 |
| Uganda | 0.4 | 29.9 | 0.5 | 21.6 | 0.1 | -8.3 |
| Mozambique | 0.8 | 18.2 | 0.9 | 42.0 | 0.1 | 23.8 |
| Madagascar | 0.2 | 55.2 | 0.2 | 36.0 | 0.0 | -19.2 |
| Malawi | 0.1 | 7.5 | 0.1 | 9.4 | 0.0 | 1.9 |
| Zambia | 0.2 | 12.2 | 0.3 | 10.0 | 0.1 | -2.2 |
| Somalia | 14.2 | 48.9 | 14.6 | 58.6 | 0.4 | 9.7 |
| Rwanda | 0.1 | 9.4 | 0.2 | 19.0 | 0.1 | 9.6 |
| Burundi | 0.1 | 5.0 | 0.3 | 19.9 | 0.2 | 14.9 |
| Eritrea | - | - | 2.3 | 45.8 | | |
| Lesotho | 0.1 | 6.2 | 0.0 | 2.4 | -0.1 | -3.8 |
| Djibouti | 0.3 | 9.4 | 0.5 | 17.8 | 0.2 | 8.4 |
| Average | 1.4 | 19.2 | 1.6 | 24.3 | 0.2 | 5.0 |
| Average | 1.2 | 17.4 | 1.7 | 23.6 | 0.5 | 6.2 |
| Asia | | | | | | |
| Bangladesh | 0.1 | 2.3 | 0.3 | 4.7 | 0.2 | 2.4 |
| Myanmar | 0.1 | 3.3 | 0.2 | 3.4 | 0.1 | 0.1 |
| Afghanistan | 0.8 | 11.7 | 1.0 | 13.2 | 0.2 | 1.5 |
| Nepal | 0.0 | 1.9 | 0.1 | 2.7 | 0.1 | 0.8 |
| Yemen | 0.1 | 3.3 | 0.2 | 5.7 | 0.1 | 2.4 |
| Cambodia | 3.0 | 6.6 | 3.1 | 6.8 | 0.1 | 0.2 |
| Lao PDR | 6.7 | 14.9 | 7.1 | 13.8 | 0.4 | -1.1 |
| Bhutan | 0.0 | 1.7 | 0.1 | 1.2 | 0.1 | -0.5 |
| Average | 1.4 | 5.7 | 1.5 | 6.4 | 0.2 | 0.7 |
| Islands | | | | | | |
| <i>Pacific Islands</i> | | | | | | |
| Solomon Islands | 0.5 | 6.2 | 0.6 | 3.7 | 0.1 | -2.5 |
| Vanuatu | 1.0 | 9.4 | 1.2 | 5.0 | 0.2 | -4.4 |
| Samoa | 35.3 | 75.9 | 43.1 | 66.6 | 7.8 | -9.3 |
| Kiribati | 3.9 | 26.8 | 5.1 | 24.9 | 1.2 | -1.9 |
| Average | 10.2 | 29.6 | 12.5 | 25.1 | 2.3 | -4.5 |
| <i>Other Islands</i> | | | | | | |
| Comoros | 1.0 | 6.4 | 2.2 | 14.5 | 1.2 | 8.1 |
| Cape Verde | 23.8 | 54.4 | 23.5 | 69.1 | -0.3 | 14.7 |
| Maldives | 0.1 | 2.3 | 0.2 | 2.2 | 0.1 | -0.1 |
| Sao Tome and Principe | 6.2 | 9.7 | 5.6 | 35.6 | -0.6 | 25.9 |
| Average | 7.8 | 18.2 | 7.9 | 30.4 | 0.1 | 12.2 |
| Average | 9.0 | 23.9 | 10.2 | 27.7 | 1.2 | 3.8 |
| Mean | 2.5 | 16.5 | 3.1 | 21.4 | 0.6 | 4.9 |
| Standard deviation | 6.4 | 20.3 | 7.2 | 20.0 | 0.8 | -0.4 |

Source: Docquier and Marfouk (2004).

Note: Averages are unweighted arithmetic means.

and 2000. Out-migration rates were especially high in several of the very small island countries, in the South Pacific and elsewhere (Sao Tome and Principe, Cape Verde and Samoa), in countries that had experienced political instability in the 1980s and 1990s (Sudan, Liberia, Mozambique, Somalia and Eritrea) and in some of the poorest countries (e.g. Sierra Leone) (chart 11). The high emigration rates of LDCs were (weakly) inversely correlated with population size and the human development index, while GDP was positively correlated with out-migration among educated people (particularly in West Africa). These findings for LDCs are similar to patterns found for other developing countries (section A). Emigration rates were lowest in some of the larger countries (Democratic Republic of the Congo, Sudan, Niger and Malawi), and in all the more populous Asian countries (especially Nepal, Myanmar and Bangladesh) (chart 22).

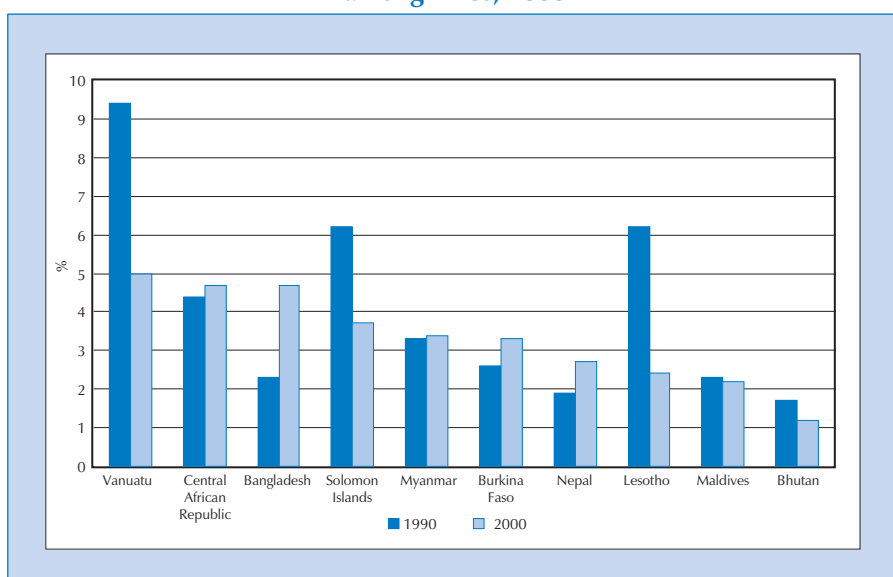
Chart 11. Ten highest rates of out-migration (tertiary educated) among LDCs, 2000



Source: Docquier and Marfouk (2004).

Out-migration rates were especially high in several of the very small island countries, in countries that had experienced political instability and in some of the poorest countries.

Chart 12. Ten lowest rates of out-migration (tertiary educated) among LDCs, 2000



Source: Docquier and Marfouk (2004).

By 2004 one million tertiary educated people from LDCs had emigrated, out of a total stock of educated persons of about 6.6 million.

Third, increases in out-migration among the tertiary educated to OECD countries were quite substantial. The unweighted mean emigration rate rose from 16.5 per cent in 1990 to 21.4 per cent 10 years later. Such intensification of emigration among skilled persons was much stronger than among all emigrants from LDCs. The latter's emigration rate increased only moderately — from 2.5 per cent to 3.1 per cent over the same period. The major increases in emigration rates for skilled persons occurred in West Africa and in Central Africa. In five LDCs — Equatorial Guinea, Sao Tome and Principe, Mozambique, Guinea-Bissau and Mauritania — the emigration rate increased by 20 percentage points or more. In the Asian LDCs, by contrast, emigration rates were fairly constant between 1990 and 2000. In the Pacific islands they declined slightly, but were still high in 2000. The largest decreases in emigration rates (between 10 and 20 percentage points lower) were in Madagascar, Gambia and Samoa.

A projection based on figures in table 30 indicates that by 2004 one million tertiary educated people from LDCs had emigrated, out of a total stock of educated persons of about 6.6 million (including over one million in Bangladesh alone).

Five LDCs with populations of four million or more ranked among the top 10 countries in the world in terms of emigration rates in 2000.

To put figures for LDCs in perspective, we have compared them with those for countries with the largest absolute number of out-migrants. Two points stand out. First, the absolute number of tertiary educated out-migrants was relatively small among all LDCs, viewed on a global scale. While several of the large origin countries (Philippines, India, China and Mexico) had about a million educated people living abroad in 2000, only Haiti among LDCs recorded close to 100,000 skilled emigrants. Most of the rest of the larger LDC exporters recorded a stock of about 20,000 to 40,000 tertiary educated people living overseas in 2000. The differences between the two groups of countries are partly a function of population size and low enrolment rates at tertiary level in the LDCs. Second, emigration rates among the educated were indeed very high by international standards in a number of LDCs. Table 32 indicates that among the large emigration countries only Jamaica recorded higher out-migration rates than Haiti, Cape Verde, Samoa, Somalia, Eritrea and Mozambique. This was not simply a matter of scale. Although emigration rates were high in some of the smallest countries, five LDCs with populations of four million or more ranked among the top 10 countries in the world in terms of emigration rates in 2000: Haiti, Somalia, Eritrea, Mozambique and Sierra Leone. Thus, even for a sample of larger countries, high emigration rates of qualified professionals are a feature of economic and social life in the LDCs.

Africa is the continent that suffers most from brain drain due to economic conditions, wage differentials, rapid population growth among young people and conflict.

D. Regional patterns

There are many similarities between countries in the main LDC regions — in Africa, Asia and the Pacific islands — but there are also some important differences related to geography, history, demography and economic development.

J A R C A

As the region with most LDCs, Africa has often been highlighted as the continent that suffers most from brain drain. The region has remained an area of net out-migration to the rest of the world, especially for skilled migrants. Economic conditions, wage differentials, rapid population growth among young people and conflict have been identified as the key reasons for high rates of out-migration (Lucas, 2006). In the African case, there is no clear resolution of the

Table 32. Migration of skilled persons from developing countries and LDCs with highest emigration rates, 2000

| Country | Total population | GDP per capita | No. of highly educated out-migrants | Emigration rate |
|---|-------------------|--------------------|-------------------------------------|-----------------|
| | (Millions) | (PPP \$) | (000) | (%) |
| | 2005 | 2005 | 2000 | 2000 |
| | (1) | (2) | (3) | (4) |
| Developing countries | | | | |
| Philippines | 84.2 | 4 923 | 1261 | 14.8 |
| India | 1 094.3 | 3 320 | 1022 | 4.2 |
| China | 1 307.6 | 7 198 | 906 | 4.2 |
| Mexico | 105.3 | 10 186 | 901 | 14.3 |
| Viet Nam | 83.2 | 3 025 | 447 | 39.0 |
| Dem. People's Rep. of Korea | 23.1 ^a | 1 800 | 423 | 5.3 |
| Cuba | 11.4 ^a | 3 900 ^b | 336 | 28.9 |
| Iran (Islamic Rep. of) | 69.5 | 7 980 | 283 | 13.1 |
| Jamaica | 2.7 | 4 381 | 261 | 82.5 |
| Brazil | 184.2 | 8 561 | 254 | 3.3 |
| Colombia | 46.0 | 7 326 | 233 | 11.0 |
| Least developed countries | | | | |
| Population > 4 million | | | | |
| Haiti | 8.3 | 1 791 | 92 | 81.6 |
| Angola | 11.1 | 2 813 | 38 | 25.6 |
| Ethiopia | 73.0 | 823 | 36 | 17.0 |
| Mozambique | 19.4 | 1 379 | 36 | 42.0 |
| Uganda | 27.2 | 1 501 | 32 | 21.6 |
| United Republic of Tanzania | 36.7 | 723 | 29 | 15.8 |
| Madagascar | 18.0 | 908 | 26 | 36.0 |
| Senegal | 11.1 | 1 759 | 24 | 24.1 |
| Somalia | 8.5 | 600 ^c | 16 | 58.6 |
| Sierra Leone | 6.0 | 903 | 14 | 41.0 |
| Rwanda | 8.4 | 1 380 | 5 | 19.0 |
| Burundi | 6.3 | 739 | 4 | 19.9 |
| Eritrea | 4.6 | 858 | 8 | 45.8 |
| Population < 4 million | | | | |
| Liberia | 3.3 | 1 033 | 14 | 37.4 |
| Samoa | 0.2 | 6 344 | 7 | 66.6 |
| Cape Verde | 0.5 | 6 418 | 5 | 69.1 |
| Source : Docquier and Marfouk (2004) for out-migration; World Economic Outlook Database (IMF), 2006, for per capita GDP; and UNCTAD, GlobStat database for population. a 2006 estimate; b 2005 estimate; c 2003–2004 estimate. | | | | |

brain gain–brain drain debate. While out-migration of skilled persons can impose severe economic and social costs in sectors such as health (see box 9), a number of factors need to be taken into account before one can conclude that emigration is negative for national economies and communities. One consideration is the underutilization of skilled persons at home, which is common in many countries, including the LDCs. In such circumstances the social costs of out-migration are likely to be lower, at least in the short run. Furthermore, gains need to be evaluated carefully. Benefits from reverse capital flows, technology transfer and greater trade with countries of origin, such as identified in the case of India and the Philippines, are likely to be small in most African LDCs. Such benefits depend critically on economic conditions and the level of development of productive capacities in home countries.

The underutilization of skilled persons at home, which is common in many countries, including the LDCs entails lower social costs of out-migration.

Box 9. The case of health practitioners

The situation facing the health-care sector has been given particular attention in the literature on brain drain, especially with reference to the plight of Africa.¹ The main factors that have been identified as contributing to the brain drain among medical practitioners are very large wage differentials between countries of destination and origin,² poor working environments and poorly designed career paths, especially for nurses. Associated problems relate to the low efficiency of health-care systems, high risks for practitioners, especially those involved in HIV/AIDS programmes, and poorly designed social security programmes.

The emigration of doctors to the United States is a case in point (Hagopian et al., 2004). The proportion of Africans is small among the large number of doctors of foreign origin in the United States, and LDC Africans make up a tiny proportion of the total.³ Nevertheless, these movements are significant in terms of the stock of doctors remaining at home. Box table 3 presents data on the number of physicians from four LDCs — Ethiopia, Uganda, Zambia and Liberia — residing in the United States. For these four countries, the percentage of doctors practising in the United States relative to the total stock of doctors back home ranged from 43 per cent (Liberia) to 10 per cent (Zambia). This might not be a problem if the stock of doctors remaining in their country of origin was sufficient to meet the needs of the population, but this is not the case. All four countries had very few doctors to serve their populations: even the country with the highest proportion — Zambia — had only seven doctors per 100,000 people. The percentage was low in all four countries, even compared with an African average of 13 per 100,000. Moreover, it was tiny compared with the United States level of close to 300. Thus, even though the absolute number of professionals from the poorest countries working abroad may be small, the impact on professional services back home can be severe. Moreover, the number of recent graduates leaving sub-Saharan Africa has been increasing in recent years (Hagopian et al., 2004).

Box table 3. Number of African trained physicians residing in the United States and Canada compared with number residing in countries of origin, 2002

| Country | No. of African trained doctors residing in the United States or Canada (A) | No. of doctors residing in place of origin (B) | A/(A+B) (%) | Physicians per 100,000 population ^a |
|--------------------|--|--|-------------|--|
| Ethiopia | 266 | 1 564 | 15 | 2.0 |
| Uganda | 175 | 722 | 20 | 3.0 |
| Zambia | 74 | 676 | 10 | 6.9 |
| Liberia | 55 | 72 | 43 | 2.3 |
| Sub-Saharan Africa | 5 334 | 12 912 | 29 | 12.5 ^b |

Source: UNCTAD secretariat adaptation from Hagopian et al. (2004, tables 1 and 2).
 a Physicians practicing in respective country or region.
 b Data for all African countries.

Among South Asian LDCs, in Bangladesh and Nepal quite substantial early investment in the health sector and a supply of well-trained English-speaking medical practitioners have facilitated the brain drain. Adkoli (2006) notes, for example, that 65 per cent of all newly graduated Bangladeshi doctors seek jobs abroad and that the country loses 200 doctors from the government sector each year.

The emigration of health professionals is not the only cause of poor standards of health care in many LDCs and ODCs, particularly since many health-care workers are unemployed prior to departure. Lack of sufficient resources and insufficient (or inappropriate) training to meet the health-care needs of national populations have also been responsible for poor health systems. However, the emigration of health professionals aggravates the situation either in the short or medium term.

¹ For general surveys see for example Hardill and MacDonald (2000), and Martineau, Decker and Bundred (2004).

² The gap amounts to over 20 times in the case of Ghanaian nurses, compared with the United Kingdom and the United States, and it is likely to be similar or higher for LDCs.

³ The large majority (some two thirds) of sub-Saharan African doctors working in the United States were from Nigeria and South Africa.

Lucas (2006) shows that in Africa tertiary enrolment and skilled emigration rates are strongly positively correlated, a fact that would seem to provide some support for the brain-drain hypothesis. Nevertheless, Lucas (p.41) warns that the interpretation of the finding for tertiary enrolments rates is not as simple as it might first appear (“whether a higher brain drain induces more students to enrol, or expanding the college education systems results in a larger exodus of the highly skilled, remain to be disentangled”), as it requires case studies covering long periods. An interpretation in favour of brain gain would be valid if emigration of tertiary graduates induces high levels of enrolment.

2. ASIA

Densely populated Asian LDCs (Bangladesh, Myanmar, Nepal, Bhutan and Cambodia) have experienced much lower levels of brain drain than the African or island LDCs, as mentioned earlier (chart 2).¹⁰ Only the Lao People's Democratic Republic has emigration rates that approach the levels of other major LDCs. This is despite the fact that tertiary-level enrolments and the stock of tertiary educated are relatively high by LDC standards. For example, gross tertiary enrolment rates were estimated at 6.5 per cent in Bangladesh according to UNESCO (2006), higher than in any other LDC economy, with the possible exception of Samoa (for which more recent data are not reported).

On the demand side, relatively rapid economic growth in recent decades, in Bangladesh and Cambodia in particular, has almost certainly increased demand for skilled persons across a range of occupations. Nevertheless, brain drain issues have been important in development debates in the largest LDC economy — Bangladesh — especially with regard to the outflow of doctors to the United Kingdom (Dovlo, 2004). Loss of skilled persons abroad is also significant in Myanmar and the Lao People's Democratic Republic, both of which have experienced slow rates of economic growth in the last decade.¹¹ In the case of Myanmar, political conflict has also been a factor over several decades.

3. ISLANDS

The very small island State LDCs in the South Pacific — the Solomon Islands, Vanuatu, Samoa, Kiribati and Tuvalu — are characterized by relatively small populations, land abundance and dependence on Australia and nearby New Zealand in particular as migration havens. Consequently, emigration is intensive in some of those countries, and skilled out-migration and associated brain drain are an important policy issue across the region. The rate of emigration of professionals is particularly high in the case of Samoa and Kiribati (table 31), although it is considered a major policy issue throughout the region. Connell (2006) draws attention to some of the underlying factors contributing to movement overseas. Many of them are strikingly similar to those applying to many smaller African countries: slow economic growth and high youth (and educated) unemployment, especially in the main towns and cities; high rates of population growth; and close proximity to former colonial countries — in this case, Australia and New Zealand — both of which have experienced skill shortages in the past decade.

Although brain drain is an issue in countries such as Samoa and Kiribati, Governments are less concerned about its impact on development than in many other LDCs. They are more likely to be proactive in encouraging out-migration in order to support resident populations, many of which have few alternatives for developing gainful occupations. The Philippines has been taken as a model for the development of beneficial links through skilled migration in Samoa and Kiribati, with nurses and seafarers playing a major role in generating remittances (Connell, 2006). Diasporas play a major role in supporting communities back home, and remittances from some groups of skilled persons have remained high over several decades.¹² Unlike in Africa, however, brain gain in the form of return migration is not an issue: it is accepted that most skilled out-migrants will never return to work in their countries of origin, except perhaps to retire. The main policy issue appears to be the utilization of remittances and the skills of those abroad to greater advantage for community and national development (for example, through temporary return visits).

Benefits from reverse capital flows, technology transfer and greater trade with countries of origin, are likely to be small in most African LDCs. Such benefits depend critically on economic conditions and the level of development of productive capacities in home countries.

Densely populated Asian LDCs have experienced much lower levels of brain drain than the African or island LDCs.

Relatively rapid economic growth in recent decades, in Bangladesh and Cambodia in particular, has almost certainly increased demand for skilled persons across a range of occupations.

In small island LDCs, the main policy issue appears to be the utilization of remittances and the skills of those abroad to greater advantage for community and national development.

Permanent emigration of skilled professionals entails a loss of human capital for the home country in the short run and hence a contraction in its absorptive capacity.

Many of those positive effects of emigration of qualified persons occur only once countries have reached a certain level of development and income growth.

LDCs are more likely to have their accumulation of technological capabilities hampered by skilled out-migration.

E. Conclusions and policy recommendations

1. IMPLICATIONS

Permanent emigration of skilled professionals entails a loss of human capital for the home country in the short run and hence a contraction in its absorptive capacity, including its capacity to make use of the major channels of international technology diffusion. This effect is particularly strong in LDCs, most of which are very poorly endowed with skills.

However, if emigrants are unemployed before leaving the country, the immediate loss for the latter is less great. Moreover, the costs of emigration can in principle be (partly) offset by other developments, including the eventual brain gain through the return of emigrants, brain circulation by means of temporary return, creation of business and knowledge linkages between emigrants and home countries (leading to technology flows, investment, etc.), higher enrolment in tertiary education and an increase in remittances. Many of those positive effects, however, occur only once countries have reached a certain level of development and income growth. That implies the existence of considerably improved economic conditions in home countries, which provide incentives for temporary or permanent return of emigrants and for the establishment of stronger knowledge and economic flows. Moreover, an improved domestic environment entails lower out-migration pressure.

That situation is obviously not the one prevailing in LDCs. Those countries are therefore most likely to suffer from brain drain, rather than benefiting from brain circulation, brain gain or the other positive effects possibly associated with emigration. The economic, social and political situation in LDCs means that the emigration rate of skilled persons in those countries is on average higher than in other groups of countries, being in some cases among the highest in the world. They are particularly high in African and island LDCs. By contrast, Asian LDCs have relatively low skilled emigration rates.

LDCs are more likely to have their accumulation of technological capabilities hampered by skilled out-migration. That situation requires policy action in order to minimize the costs of emigration and to maximize its benefits. The following subsections discuss policy alternatives that can be adopted at different levels. Some preliminary observations must be made, however. First, brain drain and the costs associated with out-migration of skilled workers are a consequence of dramatically different standards of living, wages and opportunities, widening in absolute terms, between LDCs and developed and even middle-income countries. It is not possible to halt those flows in the foreseeable future. It is therefore reasonable to suggest that policies in both sending and receiving countries should be targeted at reducing the flows that are shown to be most detrimental to national development, and at increasing the benefits from all types of skilled out-migration. Second, given the importance of circumstances in sending countries, the key to reducing the costs of brain drain, and increasing the benefits from brain gain, lies with economic and political conditions and related policies in countries of origin.

2. RECIPIENT COUNTRY POLICIES

Two broad and potentially conflicting policy objectives have emerged in recent years in countries of destination.¹³ On the one hand, both rapid ageing of

populations and rising living standards in developed countries have contributed to shortages of skilled persons. Governments in major developed countries have sought to fill those gaps by attracting qualified professionals from abroad through permanent (or long-term) immigration. On the other hand, there is growing recognition, especially in areas such as health care, that excessive brain drain can hurt developing economies and LDCs in particular. Several countries, led by the United Kingdom, have developed innovative policies to attempt to minimize the brain drain in certain sectors, especially from poor countries in Africa, but with mixed success.

The United Kingdom has been at the forefront of policies to reduce the impact of brain drain in the health sector in poorer countries (Lowell, Findlay and Stewart, 2004). Initiatives include banning National Health Service trusts from recruiting from South Africa and Caribbean countries, and the issuance by the Department of Health of guidelines on international recruitment for nurses, with a list of countries (including many in sub-Saharan Africa) from which recruitment is prohibited.¹⁴

Clearly, these are still limited objectives and might be extended to other areas where the social costs of migration are demonstrated to be high. Other European countries are still reluctant to introduce similar legislation, despite pressure from the United Kingdom. As a recent agreement between the EU and African countries indicates, developing a broader approach that slows the movement of skilled workers by seeking to dampen demand in developed countries is still a difficult task. The Joint Africa–EU Declaration on Migration and Development signed by foreign ministers on 23 November 2006 shied away from the sensitive issue of payments to African countries to compensate for the costs of skilled migration.¹⁵ The EU rejected the African ministers' proposal that a special development fund, provided by the EU, be created to finance development in order to prevent young Africans from leaving for work in Europe. In essence, that fund would seek to have the similar effect, albeit in a different form, as the long-discussed migration tax proposed by Bhagwati in the 1970s (Bhagwati and Hamada, 1974). Nevertheless, progress was indicated by the joint decisions on “[p]romoting concrete and tailor-made policies and reforms to address skills shortages caused by brain drain” by supporting human resource and educational development and on “[s]upporting programmes which foster the mobility and temporary return of members of the diasporas with the necessary skills in their countries of origin”. More proactive measures are required in order to enforce this commitment, however.

Development assistance is another, perhaps more effective, channel through which developed countries can help tackle the worst forms of brain drain. The case of the assistance provided to Malawi by the United Kingdom's Development for International Development (DFID) is instructive. Malawi has expanded the training of health professionals but has major problems in keeping staff in the country (Record and Mohiddin, 2006). DFID has developed a special programme of assistance for that country to increase training for both doctors and nurses, and to increase pay and job opportunities. DFID reports, moreover, that the programme has met with some initial success, with the enrolment of 450 new health workers, some 570 new staff members recruited to the Ministry of Health, recruitment of international volunteers and the establishment of new laboratories.¹⁶

While the United Kingdom has taken some important initiatives in the health-care sector, selective policies targeting professional and skilled workers is a major element in the country's immigration programme, regardless of country of origin (Nunn, 2005).¹⁷ Professionals accounted for approximately 40 per cent of all migration into the United Kingdom from the mid-1990s, as an integral component of the medium-term economic growth programme. While North America and

Several developed countries have developed innovative policies to attempt to minimize the brain drain in certain sectors.

In the Joint Africa–EU Declaration on Migration and Development of 2006, progress was indicated by the joint decisions on “Promoting concrete and tailor-made policies and reforms to address skills shortages caused by brain drain”.

Development assistance is another channel through which developed countries can help tackle the worst forms of brain drain.

the EU contributed the major share of foreign born academic staff, the number of African recruits totalled well over 1,000, including 100 from LDCs among lecturers and professors in the United Kingdom in 2002. In the light of a serious shortage of university staff in many African countries, Nunn recommends that the United Kingdom promote international protocols on recruitment similar to those developed by the National Health Services, in addition to efforts to improve the quality of teaching and the output of universities, and promote debate on compensatory mechanisms.

Incentives for emigrants to return home have been offered by some European countries.

Incentives for emigrants to return home have been offered by some European countries. For example, France, Italy and Germany have provided loans, training and technical assistance to migrants (World Bank, 2006). France has provided loans to emigrants from Mali and Senegal to establish businesses in their home countries. However, the small size of the programmes, lack of experience in undertaking business ventures (particularly among less educated migrants) and poor economic conditions at home are reported to have reduced the programmes' effectiveness. All those factors need to be taken into account if such programmes are to have a significant influence on the return of emigrants and on the impact of their return on local economies.

3. LDC POLICIES

The creation of employment opportunities for qualified professionals with increasing rates of pay is crucial for retaining locally trained human capital and for attracting returnees. This includes the successful development of technological capabilities in firms.

Brain retention and gain depend crucially on general economic and political developments in LDCs. The creation of employment opportunities for qualified professionals with increasing rates of pay is crucial for retaining locally trained human capital and for attracting returnees. That includes higher salaries, improved working conditions and career paths, and advances in governance, especially administrative and bureaucratic, in key public sector areas such as health and education. The successful development of technological capabilities in firms entails the creation of employment opportunities for a range of professionals, including engineers, technicians and researchers. The establishment of endowed professorships, through State, private, bilateral or multilateral partnerships, can help in retaining academic staff in LDCs (Tettey, 2003). However, targeted interventions can also be effective in the short to medium term.

LDCs should target short-term visits by skilled professionals, since that is where policy initiatives are most likely to succeed.

Policies aimed at increasing the gains from return migration have some potential for LDCs. The benefits for LDCs are likely to be greater in the case of permanent return of former emigrants (as compared with temporary returns), particularly in terms of the skills endowment of countries of origin.¹⁸ Policies to that end are, however, difficult to devise and implement, and there have been several cases of failure (see below). LDCs should therefore target short-term visits by skilled professionals, since that is where policy initiatives are most likely to succeed. They can involve teachers and professors giving crash courses, engineers providing specific inputs in sectors relevant to their field of expertise, doctors returning to assist with specific health-care campaigns, and so forth. Such actions can make a significant difference to specific development projects and programmes. Skilled persons selected from among the diaspora are likely to have the advantage over other international experts in terms of their understanding of local circumstances. Nationals living abroad who are interested in particular projects are likely to self-select if language ability and knowledge of local circumstances are important for effective application of higher-level skills in projects in LDCs. This is likely to obviate the need to apply "national preference" criteria in the selection of professionals based abroad.

Programmes targeting emigrants can also produce longer-term "external" benefits by keeping them engaged with the environment and challenges of their

home countries, and keeping open the possibility of return if conditions are favourable. Such programmes for return migration have been successfully applied by, for example, the Republic of Korea, Taiwan Province of China, Malaysia and, more recently, India and China.

One important initiative to ensure greater utilization of diaspora skills is the collection and tracking of information on the occupations and training of nationals working abroad. This requires that databases, which facilitate the establishment of networks of professionals, be established and maintained.

Countries of origin should also ensure that overseas nationals are able to retain their citizenship, even if they take up citizenship in destination countries. This means recognizing dual nationality, which may require special arrangements with countries of destination that do not allow dual citizenship, either in general or in specific cases (Aleinikoff and Klusmeyer, 2002). Other incentives involve revising regulations that discriminate against emigrants, such as eliminating restrictions on ownership of land and property.

In the health-care sector new initiatives are beginning to produce the desired effects in some countries (Dovlo, 2004). Measures taken include significant increases in salaries, especially those of nurses (Botswana); schemes to develop health-care cadres, particularly in rural areas (for example, Malawi and Zambia have clinical officers, and Mozambique has a similar category of health carer); and new programmes for management of migrant return, especially on a temporary basis. Other initiatives include extending the retirement age (for example, beyond 55, as is currently the practice in Malawi and Lesotho), using community-based curricula and strengthening training systems, especially those targeted at retaining skilled trainers. While some of those initiatives have met with resistance from the medical profession (such as substituting health cadres for trained professionals), they provide encouraging signs that targeted initiatives can have a positive impact in occupations badly affected by brain drain.

The policies described above replace unsuccessful initiatives utilized in the past. Such initiatives include programmes for the permanent return of migrants, and the use of bonds and financial sanctions. The latter have often failed because of poor administration and unrealistic restrictions placed on doctors and nurses, including long periods of placement in rural areas despite high wage differentials between those areas and urban areas, in addition to significant differentials between opportunities abroad and those at home (Dovlo, 2004).

Regional initiatives to increase the brain gain have been particularly important in Southern Africa through the South Africa Network of Skills Abroad (Mutume, 2003). Some 22,000 graduates from five countries were reported to be linked through its website to universities back home in a range of fields, including medicine, commerce, education and engineering. Brain gain consists in offers to train South African counterparts or help them conduct research, help transfer technology (for example, through the provision of computers and software) and facilitate business contacts. Initiatives of that kind could be extended to LDCs. The New Partnership for Africa's Development (NEPAD), has also addressed brain drain issues through discussion of conditions that help curb the brain drain, although concrete initiatives for LDCs in particular have not yet been addressed systematically.

Benefits deriving from programmes such as the ones outlined above are unlikely to be large in terms of overall national economic and social development, but they can assist in overcoming specific bottlenecks.

Programmes targeting emigrants can also produce longer-term "external" benefits by keeping them engaged with the environment and challenges of their home countries, and keeping open the possibility of return.

One important initiative to ensure greater utilization of diaspora skills is the collection and tracking of information on the occupations and training of nationals working abroad.

Countries of origin should also ensure that overseas nationals are able to retain their citizenship, even if they take up citizenship in destination countries. Other incentives involve revising regulations that discriminate against emigrants, such as eliminating restrictions on ownership of land and property.

4. INTERNATIONAL PROGRAMMES

International agency policies have put greater emphasis on brain gain through returnees and by working with diasporas.

While discussions of recipient developed country programmes have centred on restricting inflows and on compensation, international agency policies have put greater emphasis on brain gain through returnees. The focus has been on maximizing brain gain by working with diasporas (either providing incentives for skilled migrants to return permanently or assisting in technology and skill transfer). The International Organization for Migration has been at the forefront of those efforts, which have had mixed success. In 1983 it established the Return of Qualified African Nationals (RQAN) programme with the main objective of “mobilising, and promoting the utilisation of highly qualified, qualified and skilled personnel in the development of African countries through voluntary programs” (Wickramasekera, 2002: 11–12). Over nearly two decades some 1,500 Africans were induced to return to their home countries before the programme was discontinued. The numbers may seem very small, although they are not insignificant in the context of the importance of highly trained returnees for certain LDC African countries. Nevertheless, the high unit cost of the programme, equity considerations (with regard to colleagues back home who did not migrate) and especially lack of ownership by recipient Governments were all identified as problems. However, there are indications that qualified return migrants are making a difference by occupying key positions in the public and private sectors (Ammassari, 2005).

Qualified return migrants are making a difference by occupying key positions in the public and private sectors.

In 2001 RQAN was replaced by the Migration and Development for Africa programme, which puts much greater emphasis on short-term visits and transfer of knowledge through the Internet and diaspora groups, rather than on the permanent return of skilled migrants.¹⁹ The UN Development Fund for Women has launched a Digital Diaspora Initiative, which involves overseas professionals helping women in countries of origin use new information technologies (Mutume, 2003).

These shorter-term and more modest programmes appear to have greater chances of success, although they are not without their critics. Martin, Abella and Kuptsch (2006) note that only emigrants with permanent residence rights overseas are likely to return even for short visits, and the costs are still high by poor country standards.

Relaxing restrictions on trade in services can contribute to brain circulation of professionals from LDCs. The latter can benefit from temporary movement of professionals to technologically more advanced countries.

Relaxing restrictions on trade in services can contribute to brain circulation of professionals from LDCs. The latter can benefit from temporary movement of professionals to technologically more advanced countries, where they can enhance their skills, learn new technologies and acquire more experience. That can be useful when professionals are working once again in their home countries. Temporary emigration rules should therefore be relaxed in order to benefit LDCs. In the case of services, this could be part of commitments by destination countries on temporary movement of persons (Mode 4) under the WTO’s General Agreement on Trade in Services (Martin, Abella and Kuptsch, 2006). However, the political obstacles to temporary (contract) migration are much greater than for permanent movements. This fact is reflected in the stalled world trade negotiations of the Doha Round on those issues. Developed countries have not been prepared to remove many of the “economic needs” tests that inhibit the movements of skilled workers.²⁰

International agreements on migration, or even the creation of an international body similar to the WTO (to establish rules and procedures for regulating international migration), appear to be difficult to achieve in the short to medium term.²¹ However, regional agreements, often between LDCs and their more developed neighbours, may have greater prospects of success. For example,

the ASEAN Framework Agreement on Services of the Association of Southeast Asian Nations — the regional equivalent of arrangements through GATS — has made some progress in facilitating the movement of architects, engineers, health-care workers (mainly nurses rather than doctors) from LDCs such as Myanmar, Cambodia and the Lao People’s Democratic Republic to their better-off neighbours, particularly Singapore and Malaysia. However, actual migration under this programme is still limited; in practice, most movements between LDCs and the more developed countries in the ASEAN region have occurred as the result of unilateral policies that encourage the movement of skilled workers through the migration of “talents” and professionals on a contract basis for a period (with renewals) of up to six to seven years (Manning and Sidorenko, 2007).

Notes

1. In this chapter the terms “skilled”, “qualified worker”, “skilled professional” and “tertiary educated” are used interchangeably. The terms “out-migration” and “emigration” are also used interchangeably.
2. The numbers of professionals moving abroad on temporary contract are large, and are comparable in certain respects comparable with permanent movements. However, several of the issues for temporary migrants are somewhat different from those with respect to permanent out-migration, which was the consequence of the dominant mode of recruitment in most developed countries through to the 1980s and 1990s. Return migration is more predictable for many contract workers, although contracts are renewed in many cases, and highly valued contract workers may well become permanent. In destination countries, the brain gain related to those who do move is more immediate, but probably less substantial, and remittances are probably larger.
3. Both Canada and Australia have substantially liberalized their immigration regimes since 2000 with regard to skilled workers from abroad. Changes have occurred through programmes which allow graduates to stay on after completing their courses, and through the adoption of points systems that target specific skill groups in short supply. In Europe, the United Kingdom, France, Germany, Ireland and the Netherlands have also significantly relaxed restrictions on the employment of skilled persons through new legislation since the late 1990s (Mahroum, 2001).
4. See box 7.
5. See box 8 concerning the experience of low-income countries.
6. The migration “hump” refers to the process whereby the rate of (net) out-migration increases in the early stages of economic development until it reaches a peak, somewhere in the middle-income range of national GDP per capita, and then begins to decline.
7. More recent studies show that those patterns continued thereafter (Adams, 2003).
8. The main source of data is Docquier and Marfouk (2004), which was updated in Docquier and Marfouk (2006). While the earlier study contains data for a quite large number of countries, the revised version reports only the data for selected countries. The latter reports higher migration rates in 2000 for the Lao People’s Democratic Republic (37 per cent compared with 14 per cent reported in the earlier version), Uganda (36 per cent compared with 22 per cent) and Angola (33 per cent compared with 26 per cent); at the same time, the rate is lower for Somalia (33 per cent versus 59 per cent earlier). For consistency, we have used only the data from the 2004 publication for the discussion of country trends in this chapter. While the absolute rates differ between the two studies, only the Lao People’s Democratic Republic (which was already the highest out-migration country among LDCs in Asia according to the 2004 study) changes significantly in ranking among the high emigration countries.
9. The main sub-regions among LDCs in Africa are East, Central and West Africa. Sudan and Lesotho are included in Central and East Africa respectively. Haiti is included in West Africa.
10. Iguchi (2003) and Chalamwong (2004) provide general surveys of skilled migration from Asia.
11. In the case of Myanmar, official OECD data on out-migration are probably a significant underestimate, given substantial movements to other South and South-East Asian countries (such as the employment of Myanmar doctors in Malaysia). For a discussion of the migration of health care and IT professionals from those two countries within South-East Asia, see Manning and Sidorenko (2007).
12. Brown and Connell (2006) demonstrate that Samoan and Tongan nurses continued to remit considerable amounts back home 20–25 years after emigration, contrary to the pattern found elsewhere, whereby diaspora links with home countries and remittances tend to decline over time.
13. Lowell (2002), Lowell and Findlay (2002), Wickramasekera (2003) and Lowell, Findlay and Stewart (2004) provide general surveys of developed country policies.
14. www.dfid.gov.uk/news/files/world-health-day-2006.asp.
15. See www.euractiv.com/en/justice/eu-africa-talk-migration-brain-drain/article-159976.
16. www.dfid.gov.uk/news/files/world-health-day-2006.asp.
17. The three-tier programme launched in 2002 differentiates between the highly skilled (doctors, lawyers, engineers and academics), the skilled (nurses, teachers and administrators) and the low skilled.
18. See box 8.
19. Other international programmes include the Return for Qualified Afghans Programme (co-funded by the EU) and the Transfer of Knowledge Through Expatriate Nationals project run by the UNDP. The latter also stresses returns for shorter periods of three to six months (Lowell, Findlay and Stewart, 2004).

20. "Economic needs" tests require host employers to demonstrate that local workers with equivalent skills are not available.
21. Bhagwati (2003) has been in prominent in calling for the establishment of a world migration body equivalent to the WTO.

References

- Adams, R.H. (2003). International migration, remittances and the brain drain: A study of 24 labor-exporting countries. Policy Research Working Paper No. 3069, World Bank, Washington, DC.
- Adams, R.H. (2007). International remittances and the household: Analysis and review of global evidence. Policy Research Working Paper No. 4116, World Bank, Washington, DC.
- Adkoli, B.V. (2006). Migration of health workers: Perspectives from Bangladesh, India, Nepal, Pakistan and Sri Lanka. *Regional Health Forum*, 10 (1): 49–58.
- Aleinikoff, T.A. and Klusmeyer, D. (2002). *Citizenship Policies for an Age of Migration*. Carnegie Endowment for International Peace, Washington, DC.
- Ammassari, S. (2003). From nation-building to entrepreneurship: The impact of elite return migrants in Côte D'Ivoire and Ghana. Paper presented at the International Workshop on Migration and Poverty in West Africa, 13–14 March, University of Sussex, UK.
- Ammassari, S. (2005). Migration and development: New strategic outlooks and practical ways forward. The cases of Angola and Zambia. IOM Migration Research Series, No. 21, Geneva.
- Bhagwati, J. (2003). Borders beyond control. *Foreign Affairs*, 82 (1): 98–104.
- Bhagwati, J. and Hamada, K. (1974). The brain drain, international integration of markets for professionals and unemployment. *Journal of Development Economics*, 1 (1): 19–42.
- Brown, R.P. and Connell, J. (2006). Occupation-specific analysis of migration and remittance behaviour: Pacific nurses in Australia and New Zealand. *Asia Pacific Viewpoint*, 47 (1): 135–150.
- Chalamwong, Y. (2004). The migration of highly skilled Asian workers in OECD member countries and its effects on economic development in East Asia. Unpublished paper presented at an Experts Seminar, 10–11 June, OECD, Paris.
- Connell, J. (2006). Migration, dependency and inequality in the Pacific: Old wine in bigger bottles. In Firth, S. (ed.), *Globalisation and Governance in the Pacific Islands*. Pandanus Press, Canberra.
- Docquier, F. and Marfouk, A. (2004). Measuring the international mobility of skilled workers (1990–2000). Policy Research Working Paper No. 3381, World Bank, Washington, DC.
- Docquier, F. and Marfouk, A. (2006). International migration by education attainment, 1990–2000. In Ozden, C. and Schiff, M. (eds.), *International Migration, Remittances and the Brain Drain*. World Bank and Palgrave Macmillan, Washington, DC and New York: 151–199.
- Docquier, F. and Rapoport, H. (2004). Skilled migration: The perspective of developing countries. Policy Research Working Paper No. 3381, World Bank, Washington, DC.
- Dovlo, D. (2004). The brain drain in Africa: An emerging challenge to health professionals' education. *Journal of Higher Education in Africa*, 2 (3): 1–18.
- Faini, R. (2006). Remittances and brain drain. IZA Discussion Paper Series No. 214, Institute for the Study of Labour (IZA), Bonn.
- Grubel H.B. and Scott, A.D. (1966). The international flow of human capital. *American Economic Review*, 56: 268–274.
- Hagopian, A., Thompson, M.J., Fordyce, M., Johnson, K.E. and Hart, L.G. (2004). The migration of physicians from sub-Saharan Africa to the United States of America: Measures of African brain drain. *Human Resources for Health*, 2 (17): 2–10.
- Hardill, I. and MacDonald, S. (2000). Skilled international migration: The experience of nurses in the United Kingdom. *Regional Studies*, 34 (7): 681–692.
- Iguchi, Y. (2003). The movement of the highly-skilled in Asia: Present situation and future prospects. In OECD (ed.), *Migration and the Labour Market in Asia: Recent Trends and Policies*. Organisation for Economic Co-operation and Development, Paris.
- IMF (2005). *World Economic Outlook*. International Monetary Fund, Washington, DC.
- Kanbur, R. and Rapoport, H. (2004). Migration selectivity and the evolution of spatial inequality. Cornell University, Ithaca, NY, mimeo.
- Kokko, A. (1994). Technology, market characteristics, and spillovers. *Journal of Development Economics*, 43: 279–293.
- Lowell, B.L. (2002). Policy responses to the international mobility of skilled manpower. International Migration Paper No. 43, International Labour Organization, Geneva.

- Lowell, B.L. and Findlay, A. (2002). Migration of highly skilled persons from developing countries: Impact and policy responses: Synthesis Report. International Migration Paper No. 44, International Labour Organization, Geneva.
- Lowell, B. L., Findlay, A. and Stewart, E. (2004). Brain strain: Optimising highly skilled migration from developing countries. Asylum and Migration Working Paper No. 3, Institute for Public Policy Research, London.
- Lucas, R.B. (2004). *International Migration and Economic Development: Lessons from Low-Income Countries*. Edward Elgar, Cheltenham, UK.
- Lucas, R.B. (2006). Migration and economic development in Africa: A review of evidence. *Journal of African Economies*, 15 (2): 337–395.
- Mahroum, S. (2001). Europe and immigration of highly skilled labour. *International Migration*, 39 (5): 27–43.
- Manning, C. (2007). Brain drain and brain gain: A survey of issues, outcomes and policies in the least developed countries (LDCs). Study prepared for UNCTAD as a background paper for *The Least Developed Countries Report 2007*, UNCTAD, Geneva.
- Manning, C. and Sidorenko, A. (2007). The regulation of professional migration in ASEAN: Insights from the health and IT sectors. Department Working Paper No. 2006-08, Division of Economics, Australian National University, Canberra.
- Martin, P., Abella, M. and Kuptsch, C. (2006). *Managing Labor Migration in the Twenty-First Century*. Yale University Press, New Haven.
- Mayer, J. (2001). Technology diffusion, human capital and economic growth in developing countries. UNCTAD Discussion Paper No. 154, UNCTAD, Geneva.
- Martineau, T., Decker, K. and Bundred, P. (2004). "Brain drain" of health professionals: From rhetoric to responsible action. *Health Policy*, 70 (1): 1–10.
- Mountford, A. (1997). Can brain drain be good for growth in the source economy? *Journal of Development Economics*, 53 (2): 287–303.
- Mutume, G. (2003). Reversing Africa's "brain drain". *Africa Recovery*, 17 (2): 1–9.
- Niimi, Y. and Ozden, C. (2006). Migration and remittances. Policy Research Working Paper No. 4087, World Bank, Washington, DC.
- Nunn, A. (2005). The brain drain: Academic and skilled migration to the United Kingdom and its impact on Africa. Report prepared for the Association of Teachers and the College and Lecturers Union, Policy Research Institute, University of Leeds, United Kingdom.
- Ratha, D. and Shaw, W. (2007). *South–South Migration and Remittances*. World Bank, Washington, DC.
- Record, R. and Mohiddin, A. (2006). An economic perspective on Malawi's medical "brain drain". *Globalization and Health*, 2 (12): 1–8.
- Russel, S.S., Jacobsen, K. and Stanley, W.D. (1990). International migration and development in sub-Saharan Africa. World Bank Discussion Paper No. 101, World Bank, Washington, DC.
- Saxenian, A., Motoyama, Y. and Quan, X. (2002). *Local and Global Networks of Immigrant Professionals in Silicon Valley*. Public Policy Institute of California, San Francisco.
- Schiff, M. (2006). Brain gain: Claims about its size and impact on welfare and growth are greatly exaggerated. In Ozden, C. and Schiff, M. (eds.), *International Migration, Remittances and Brain Drain*. World Bank and Palgrave Macmillan, Washington, DC and New York: 201–225.
- Stark, O. (2004). Rethinking the brain drain. *World Development*, 32 (1): 15–22.
- Tettey, W.J. (2003). Africa's options: Return, retention or diaspora? SciDecNet Policy Briefs (www.scidev.net).
- UNCTAD (2006). *The Least Developed Countries Report 2006: Developing Productive Capacities*. United Nations publication, sales no. E.06.II.D.9, Geneva and New York.
- UNESCO (2006). *Global Education Digest 2006: Comparing Education Statistics Across the World*. UNESCO, Paris.
- Wickramasekera, P. (2003). Policy responses to skilled migration: Retention, return and circulation. Perspectives on Labour Migration, Report No. 5E, International Migration Programme, International Labour Office, Geneva.
- World Bank (2006). *Global Economic Prospects 2006. Economic Implications of Remittances and Migration*. World Bank, Washington, DC.