

Background Paper The Learning Generation

Migration, Education and Development

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Migration, Education and Development¹

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Executive summary

The relationship between migration and education is fraught with controversy. Major unresolved issues include: Does high-skilled emigration reduce productivity and the delivery of critical services in developing countries? What are the implications of high-skilled emigration for government support for education? Is low-skilled emigration entirely beneficial to origin developing countries? Does a parent migrating increase access to education for children left behind? And how can developing countries profit from the high-skilled diaspora? This paper reviews the insights available from the economic literature on the relationship between migration and education, with a view towards informing policy.

The answers to these questions are heavily dependent on context. For example, the impact of high-skilled emigration on origin country growth will depend, in part, on the skill composition of the labor force and the ability of the origin country economy to capitalize on the potential for technology transfer from the diaspora. The impact of low-skilled emigration will depend on the extent of low-skilled unemployment and under employment. The impact of remittances on education may depend on the availability of local schools, the level of household income, whether the mother or father emigrates, or the return to education in the migrant parent's job. In general, the level of development, the prospects for economic growth, and the policy and institutional environment will condition the relationship between migration, education, and development. Thus, instead of calculating the net benefit from migration, our focus will be on determining what conditions in each context ensure that the interaction between education and migration promotes development.

A few main conclusions emerge from this survey of studies on migration and education:

Few rigorous evaluations have been done of training targeted at migrants. It appears that financial literacy training has been useful in raising financial knowledge and savings among migrants and their households in origin countries. Language training has had more impact on employment than on the

¹ This paper benefited greatly from guidance from Dilip Ratha, both in terms of specific issues addressed in the paper and insights gained over the course of numerous discussions on the topic of migration and remittances. Detailed and extremely useful comments from Nicholas Burnett and Paul Isenman are also gratefully acknowledged.

earnings of those who are employed. Evidence from Scandinavian countries indicates that temporary employment subsidies have increased the regular (non-subsidized) employment of newly-arrived immigrants. Educational systems in origin countries likely provide the largest contribution to language training of migrants.

The preponderance of evidence indicates that the receipt of remittances improves access to education of children left behind. Higher incomes from remittances and increased incentive to attend school (because a parent's emigration opens up opportunities in foreign countries where the return to education is higher than in the origin country) usually outweigh the family disruption attendant on migration that might reduce schooling. However, remittances may not increase access to education if local schools are inadequate, or if the return to education in available migration opportunities is low (as in irregular migration from Mexico to the United States).

Governments can play an important role in improving the developmental impact of remittances. While most remittances are sent directly to the household, government matching of collective remittances has helped channel funds to education, health and other community projects. However, many collective remittance programs are small and may not reach the poorest communities. Financial sector policies that reduce the costs of remittance transfers can increase the contribution of remittances to education, and to welfare in general. Governments also can increase their access to finance through the securitization of future remittance flows.

High-skilled emigration can impair public services and reduce productivity in origin countries. However, high-skilled emigration also generates benefits through remittances, increased trade and investment, technology transfers, support for domestic institutions, returning workers, and (more controversially) a higher stock of human capital as incentives for education increase. The net impact of high-skilled migration is uncertain, and depends on context. Large high-skilled emigration rates from small, poor countries have likely impaired their development, while technology transfers from the diaspora have undoubtedly spurred development in rapidly-growing emerging markets. The quality of the institutional environment determines both the extent of high-skilled emigration (at the extreme, high-skilled workers may be more able to flee civil wars than poorer workers) and the ability of the origin country to benefit from technology transfers and business opportunities.

Large outflows of high-skilled workers present challenges for origin country policies. Efforts to prevent the emigration of university graduates or to impose service requirements upon graduation are difficult to enforce and can discourage return and networking. Nevertheless, some period of public service in countries suffering from a scarcity of professionals may be viewed as an appropriate return for government-financed education. The emigration of teachers has reduced teacher/pupil ratios and impaired the quality of instruction in some countries. Some middle-income countries have compensated for large outflows of teachers by recruiting in nearby, poorer countries. The emigration of large numbers of graduates may reduce public commitment to university education, particularly if high-skilled emigration increases tax receipts (for example because diaspora connections increase business opportunities or remittances raise economic activity by households) only with some delay. However, public commitment to higher education may be little affected by high-skilled emigration in countries (for example, India) where the benefits of an educated diaspora are well recognized. One approach is to focus subsidies on poorer students, who are less likely to have the ability to emigrate.

The effectiveness of government support for increased remittances and other flows from diaspora networks has been uneven, and to the extent possible programs should rely on private sector organizations, for example alumni associations. Programs in several countries that use subsidies to encourage return have been open to abuse, have generated resentment, and have had limited impact. However, subsidies and opportunities for professional advancement may be effective in attracting back émigré scientists to countries with solid growth prospects. Providing for dual citizenship and recognizing professional qualifications earned abroad could facilitate the return of highly-educated workers.

Low-skilled emigration can increase low-skilled wages in developing countries. In some cases, however, even large outflows of low-skilled workers have been found to have little impact on wages, perhaps because of the limited time period examined, or a deterioration in the institutional environment that reduces the demand for labor.

The first section introduces the subject by reviewing recent trends in migration and remittances, with some speculation on the prospects for migration. The next section considers training and education programs that have the potential to raise the return to migration. We then review the voluminous studies of whether migration and remittances improve access to education for children left behind, followed by a discussion of the costs and benefits of high-skilled migration. The next section considers how our conclusions about the impact of migration change when considering low-skilled and south-south migration. A final section lists concrete policy recommendations.

Migration trends

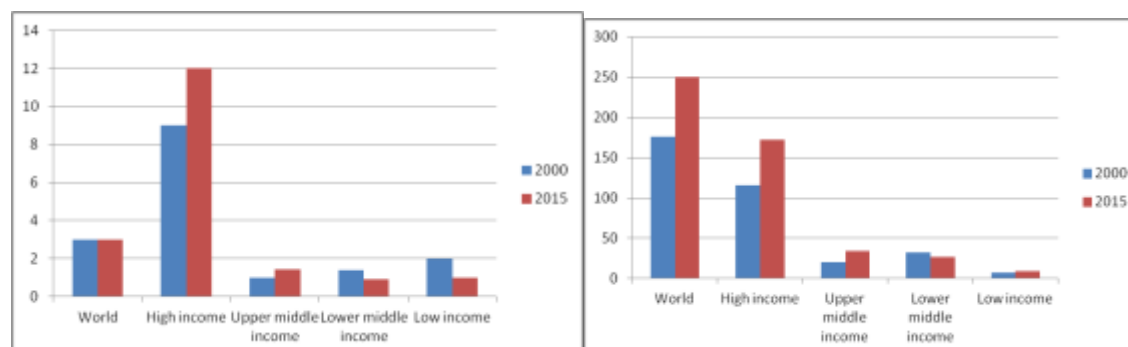
Migration and remittances have increased since 2000

In 2015, an estimated 250 million people in the world lived outside their country of origin, about 70 percent of them in high-income countries, up from 173 million in 2000 (figure 1). Almost two-thirds of all migrants came from middle-income countries in 2013 (the latest available year for bilateral migration data), with most of these going to high-income countries (table 1). Migrants from lower middle-income countries were somewhat more likely to settle in low-income countries, and less likely to go to high-income countries, than migrants from upper middle-income countries. By contrast, only a quarter of migrants from low-income countries were in high-income countries, indicating the importance of proximity and ability to find jobs in destination countries in determining migration patterns (see below). Interestingly, about a quarter of migrants from high-income countries went to developing countries, about twice the share of migrants from upper middle-income countries going to other developing countries. This may in part reflect the potential for higher-income retirees to settle in areas with attractive climates.

While the number of migrants worldwide increased by 2.5 percent a year from 2000-15, so did population, so that the share of the global population that were migrants remained at 3 percent. However, immigrants in high-income countries rose from 9 percent of the population in 2000 to 12 percent in 2015. By contrast, the number of immigrants compared to developing countries' population changed only marginally. Upper middle-income countries saw a rise in the migration rate, and lower middle-income countries a fall.

Figure 1: The global stock of migrants has kept pace with population since 2000

(a) Population share in destination regions (%) (b) number of migrants (millions)



Source: World Bank and United Nations Population Division

Abel and Sander (2014) reach similar conclusions using census data to measure global migration flows, as opposed to the stock data described above. The percentage of the global population moving between countries was relatively stable from 1995 to 2010. Their data provide some interesting insights into migration flows. First, international migrants from Sub-Saharan Africa move predominantly to other countries in the region. Second, migration flows from Asia and Latin America are relatively concentrated in particular destinations (for Asia, other Asian countries and North America, and for Latin America, North America and Southern Europe). Third, the largest flows of international migrants occurred between neighboring regions, although longer-distance migration also was significant. Since their analysis, the number of forced refugees going to neighboring countries has increased significantly with the Syrian crisis.

The number of migrants may include temporary migrants and forced migration, although datasets covering these categories are not necessarily consistent or comprehensive. While temporary migration is difficult to define or to measure, a significant share of the stock of migrants at any point in time are only in the foreign country for a temporary period, either due to their own preferences or constraints imposed by destination countries. After 10 years, almost half of the original immigrants had left the destination country in Europe, and 20 percent in Australia, Canada, New Zealand, and the United States (Dustman and Gorlach 2015). OECD (2008) estimates that between one-fifth and one-half of immigrants leave host countries within 5 years after arrival. Forced migrants make up only a small share of the total migrant stock (World Bank and KNOMAD 2016). The UN High Commissioner for Refugees reported the total number of refugees (excluding Palestinians) at just over 15 million in June 2015, although this does not include migrants fleeing conflict but who are not recognized as refugees, as well as migrants forced to leave due to environmental disasters.

Data on south-south migration is less available and reliable than data on south-north migration.² It is likely that the magnitude of south-south migration is understated, given that borders in many poor countries tend to be porous, while large cross-border flows within ethnic groups probably escape enumeration. Most migrants from Sub-Saharan Africa go to other countries in the region, and often to

² Estimates of south-south migration also differ, depending on what definition is used for developing versus developed countries (Campillo 2013).

nearby countries. For example, from 2000 to 2005, 1 million West Africans moved to other West African countries, and only 277 thousand West Africans moved to Western Europe. By contrast, most migrants from South and South East Asia move to Western Asia, North America, or Europe (Abel and Sander 2014).

Table 1: South-south migration is large among low-income countries (share of migrants from designated source region in 2013, percent)

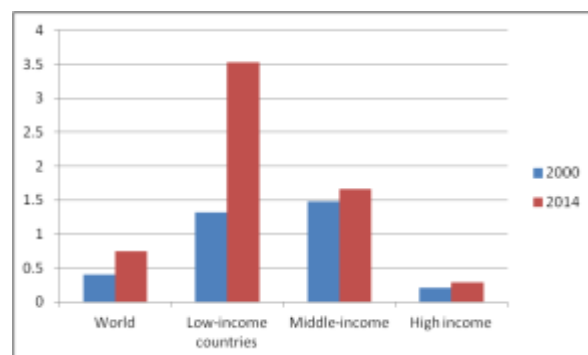
Destination region(across)	Low-income countries	Lower-middle-income countries	Upper-middle-income countries	High-income countries	Total
Source region(down)					
Low-income countries	18.1	34.2	21.9	25.9	10.4
Lower-middle-income countries	3.6	11.5	15.7	69.1	36.2
Upper-middle-income countries	0.5	4.4	7.0	88.1	28.7
High-income countries	0.3	10.2	14.7	74.8	24.8
Total	3.4	11.5	13.6	71.5	100.0

Source: World Bank

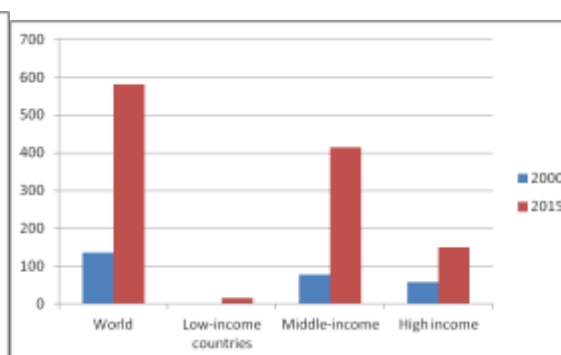
Global remittances receipts increased from \$135 billion in 2000 to about \$600 billion in 2015 at current prices, with the major share of the rise going to middle income countries (figure 2). Remittances receipts in middle-income countries rose slightly compared to GDP over this period, while remittances to low-income countries more than doubled as a share of GDP. Remittances to developing countries have increased more rapidly than FDI and ODA flows, and have been less volatile than private capital flows over this period.

Figure 2: Remittances have increased

(a) % of GDP



(b) \$ billion



Migration may rise further

Predicting the level of international migration is a hazardous exercise, given our limited ability to gauge the number and location of migrants, to estimate the relationship between the drivers of migration and flows, and to predict changes in these drivers. The net result of strong forces tending to increase or decrease migration has resulted in an unchanged global migration rate over the past 15 years, but there is no reason to believe that will necessarily continue. Speculation over the likely evolution of migration

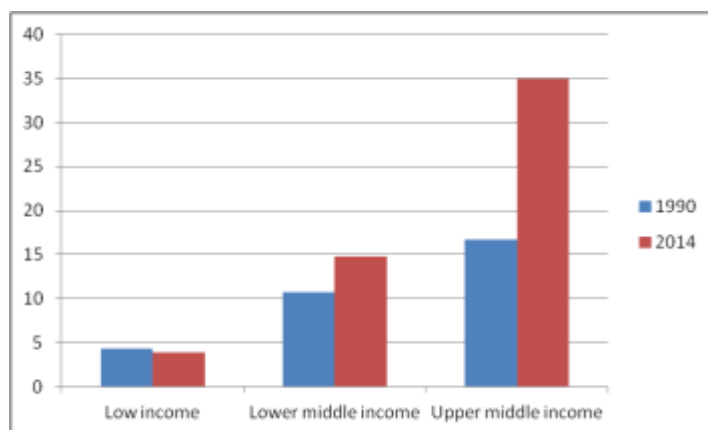
can be framed in terms of these forces, beginning with migration from developing to high-income countries:

- (i) Differences in wages are a driving force behind migration, and in global terms these remain quite large.³ Average per capita income (in PPP terms) in low income countries has remained only about 4 percent of the average for high-income countries since 1990 (figure 3). Upper middle-income countries' average per capita income has grown rapidly, but remains only 35 percent of the high-income country level. Per capita income increased less rapidly in lower middle-income countries, and by 2015 was only 15 percent of per capita income in high-income countries. Data on average incomes provide only limited information on wage differentials for similar jobs, which is the main economic motivation for migration. Nevertheless, these data do indicate that the incentive to migrate remains high.
- (ii) Demographic trends are likely to add to pressures for migration. Aging in Europe, Japan and the United States is reducing the share of the working age in the population, while the working age populations of Africa and Asia are expected to increase by over 1 billion people by 2050. To a large extent, this demographic divergence may be reflected in increased trade flows. However, the demand for services that require proximity is likely to rise as rich country populations age. Technological innovation (e.g. robots and ever more effective telecommunications) will continue to increase the range of services that can be provided without close human contact. Nevertheless, population aging in rich countries will boost demand for migrant workers.
- (iii) The cost of migration has been an important barrier to emigration from low-income to high-income countries. Low-income countries' average incomes have more than doubled since 1990, while the costs of transportation and communications have plummeted. Moreover, entirely new technologies (e.g. Skype) are making it easier to interact with families back home and reducing the sacrifices that have to be made in order to migrate. Thus, it is likely that the number of people in developing countries that can cover the costs of migration has increased significantly.
- (iv) Another important determinant of the ability to migrate is whether workers have the skills to obtain a job in the destination country. To the extent that relative income levels measure the gap in skills, a larger share of workers from upper middle income countries may be able to migrate to rich countries, while the prospects of migration for workers from lower middle-income countries has increased only marginally, and the prospects for migration from low-income countries have not improved.
- (v) Networks facilitate migration by disseminating information on employment opportunities in destination countries to origin communities, helping new migrants find jobs, and assisting with the costs of transition (e.g. a place to stay, financial assistance during the job search period). Thus, the rise in the share of migrants in rich countries' populations over the past 15 years is likely to generate pressures for even greater increases in migration.
- (vi) Finally, resistance to immigration is rising in high-income countries. The Syrian crisis has given impetus to anti-immigration forces in Europe, in the United States longstanding economic grievances are increasing natives' resentment of immigrants, and the rich Middle Eastern oil

³ Migration also occurs for economic reasons in the absence of income differentials, for example to diversify sources of income or due to relative deprivation or low status within a community (see Stark and Taylor 1989).

exporters are becoming increasingly concerned with the very high shares of immigrants in their populations. Whether these pressures will be successful in limiting immigration is unclear.

Figure 3: Developing countries' incomes remain well below rich countries' incomes (percent of average GNI per capita in high-income countries, 1990 and 2014)



Source: World Development Indicators database, www.worldbank.org/data

All in all, the forces pushing for greater migration from developing to rich countries appear formidable. Given the difficulties in controlling immigration in democratic societies and the important economic interests within rich countries that support relatively open borders, the rise in immigrants relative to rich countries' population is likely to continue. However, migration has become a major political issue in high-income countries, with unpredictable consequences for the strengthening and effectiveness of controls on immigration.

South-South migration is also likely to increase. Income differentials within the developing world have, if anything, increased over the past 25 years, which may spur greater migration. Environmental degradation, driven by climate change and the failure to conserve scarce water and soil resources, is likely to result in large increases in international, as well as internal, migration. And while impossible to forecast, forced migration due to political violence does not appear to be on the wane, as disputes in the Middle East and in Africa appear intractable. Demographic trends also may result in increased migration to countries in the developing world with older populations, including Russia and China, while barriers to immigration in rich countries may shift more migrants to the rapidly-growing countries of Asia.

The composition of international migration is likely to change along several dimensions. The combination of growing political opposition to, and increasing economic pressures for, migrant labor could result in more irregular migration, reducing the return to migration and increasing the potential for exploitation and abuse. Temporary migration programs with controls that enforce return may gain in popularity. The growing importance of scientific networks, combined with concern over the impact of low-skilled immigration on inequality in host countries, may increase the skill bias in rich countries' immigration policies.

Two major points emerge. If anti-immigration forces have a substantial impact on policy in rich countries, then future authorized south-north migration could be largely composed of movements by the well-educated elite, who are likely to be acceptable politically and indeed are the target of immigration policies in several countries. However, irregular migration of the relatively low-income may continue in response to compelling economic pressures, depending on the success of enforcement of barriers to migration. South-South migration could be increasingly dominated by forced migration due to environmental problems and conflict.

Training for the global jobs market

Training programs can improve the return to migration, but their effectiveness is uncertain

Pre-departure training programs are offered by a limited number of origin country governments. Philippines has the most extensive program, which is intended to ease the transition to life abroad, provide useful technical skills, prevent human trafficking and abuse, and teach financial literacy. The IOM provided pre-departure seminars to 352,000 migrants over 2001 to 2010 (IOM 2011). Evaluations of these programs mostly have involved interviews, site visits, and the examination of documents, rather than rigorous impact evaluations. The few more research-oriented evaluations have been unable to identify the causal effects of programs, although a promising study is underway in the Philippines (McKenzie and Yang 2015). More passive interventions in the Philippines that did not involve training, for example provision of information and help with filling out documents, had no impact on increasing international migration (Beam, McKenzie and Yang 2014).

There is some evidence that financial literacy programs increase financial knowledge and savings in households left behind in origin countries. Doi, McKenzie and Zia (2014) find that financial literacy training increased financial knowledge, and that training both the migrant and the family left behind increased savings in the origin country household. Financial training of immigrants in the destination country helped to increase joint decision-making with spouses and raised savings (Seshan and Yang 2014), while financial literacy training in Australia and New Zealand led to increases in financial knowledge, but did not affect the frequency or amount of remittances sent home (Gibson, McKenzie and Zia, 2014).

Destination countries offer various kinds of assistance to help immigrants find employment. Intensive counseling and coaching provided in a Swedish program was found to have a significant, positive impact on finding a job, although the long-term effects were not evaluated (Joona and Nekby 2012). Many active labor market programs have been targeted at immigrants, or included many immigrants along with natives. The provision of training (including language training) and subsidized employment in Finland increased employment and reduced immigrants' dependence on social benefits (Sarvimaki and Hamalainen 2012). Clausen et al. (2009) find that subsidizing private sector employment is the most effective means of increasing regular employment among newly-arrived immigrants. Heinesen, Husted and Rosholm (2011) find that active labor market programs in Denmark, and in particular subsidized employment programs, played a significant role in helping immigrants find regular employment.

Proficiency in the destination country language and the ability to learn it quickly can be critical to immigrants' educational success and increase their earnings and opportunities for employment (Esser 2006). While language proficiency is associated with higher earnings of immigrants, there is little rigorous evidence showing stand-alone language training is generally successful in improving employment outcomes (McKenzie and Yang 2015). Norwegian immigrants who participated in language

training programs were more likely to improve their fluency and reading proficiency than those who did not (Hayfron 2001). However, the training did not have a significant effect on earnings, perhaps because minimum proficiency improved the chances of getting a low-skilled job where wages were not that sensitive to higher levels of proficiency. Canadian immigrants participating in an English language training program achieved modest improvements in employment, income and occupational status after graduation (Weirermair 1976). Language training in Canada of refugees from Vietnam did not significantly improve their language skills, perhaps because interventions before the study reduced the variation in language proficiency across the study group (Hou and Beiser 2006).

There is some anecdotal evidence of success in language training in origin countries. For example, the ILO and the Government of Bangladesh are providing training in Arabic to enable Bangladeshi villagers to get jobs in GCC countries (ILO 2014). The Government of Korea's Employment Permit System provides training to workers before they leave for Korea, including preparation to pass the Korean Language Proficiency Test. Kim (2015) finds that the greater attention to language training compared to earlier temporary admissions programs in Korea improved immigrants' fluency.

Many migrants learn the destination country language from their schooling in origin countries

Developing countries' educational systems play a much larger role in language training for potential migrants than the targeted programs described above. Having learned a foreign language in school affects migrants' choices of destination countries and the return to migration. For example, Adsera and Pytlikov (2015) find that the bilateral migration flow to a country with the same official language is 20 percent higher than to a country with the most 'distant' language, after controlling for other determinants of bilateral flows.⁴ The relationship between bilateral migration flows and linguistic proximity is much smaller for English speaking destination countries, which the authors attribute to the common teaching of English in many origin country schools. The amount of education at entry into the United States is positively associated with the ability to learn English over time, in part because many educated immigrants had studied English (Espenshade and Fu 1997). Chiswick and Lee (2006) find that exposure to English before emigration is an important determinant of English proficiency among immigrants in Australia. Gibson and McKenzie (2009) find that for three Pacific countries, the choice of studying a foreign language in secondary school is strongly and positively associated with emigration.

The role of pre-emigration education in language proficiency is important, because initial differences in language proficiency can have lasting effects on earnings. Workers who emigrated to the United States at a young age (when it is easier to learn a language) achieve greater proficiency in English (Stevens 1999) and have higher earnings due to greater language proficiency (Bleakley and Chin 2004) than workers who emigrated when they were older.⁵

⁴ The authors measure linguistic difference by a weighted average of the number of levels of the linguistic family tree the languages share.

⁵ Bleakley and Chin (2004) also show that US immigrants from English-speaking countries who arrived when they were young do not earn significantly more than US immigrants from these countries who arrived later in life, indicating that differences in earnings due to age of arrival are the result of better language proficiency rather than other aspects of the relationship between age and integration.

While not explicitly measured, the implication of these studies is that migrants who have studied the destination country language will gain a larger return to migration (although the opportunity cost of learning a foreign language as opposed to another subject is not considered). Note also that exposure to a foreign language, particularly in former colonies, does not just occur through education. Countries where many languages are spoken tend to use the former colonial language as a *lingua franca*. Therefore, for example, emigrants from India are more likely to know English, and thus have some advantage in English-speaking destination countries, compared to emigrants from Bangladesh.

It is unclear whether massive devotion of educational resources to foreign language training can be justified by increasing opportunities to migrate. However, language training can generate substantial economic returns for non-migrants, by facilitating communications with foreign trade and investment partners, as well as opening up the global opportunities for learning now afforded by the Internet. Angrist and Lavy (1997) find that Moroccan workers who attended school after the switch from French to Arabic as the language of instruction (which had important non-economic motivations) earned significantly less in Morocco than older students who had learned in French. By contrast, Gray (2003) argues that the universal English language requirements of educational systems in Korea and China (which cost an estimated \$3 billion in Korea and \$1.2 billion in China, per year) provide little benefit to the average student, so that intensive language training should be limited.

Overall, experience provides some reasons for optimism concerning the effectiveness of language training, particularly in conjunction with other assistance, in improving the ability of immigrants to find jobs. Subsidizing employment has helped immigrants transition to regular jobs, although most of the rigorous evaluations of active labor market programs come from Scandinavian countries, which may limit confidence in their applicability to other contexts. Policy makers would be advised to proceed cautiously in this area, beginning with small-scale programs with limited costs, which can be ramped up if they have a measurable impact. Nevertheless, luck and family circumstances play a large role in language proficiency; immigrating at a young age when it is easier to learn a second language, or having studied the destination country language in school, appear to have a more significant impact on language proficiency than adult training programs.

Migration, remittances and access to education

Migration and remittances can improve access to education for children left behind

Household surveys show that a significant share of remittances is spent on education. For example, the share of remittances from outside Africa spent on education equaled 12.4 percent in Burkina Faso, 9.6 percent in Kenya, 22.1 percent in Nigeria, 3.6 percent in Senegal, and 12.7 percent in Uganda (Plaza, Navarette and Ratha 2011). However, more rigorous evaluation is required to determine whether the receipt of remittances increases household expenditures on education. One approach is to compare actual educational expenditures with the level of expenditures that would have occurred if a parent had not migrated, essentially by predicting household earnings in the absence of migration based on the characteristics of the migrant.

The impact of remittances on education in households left behind reflects the combination of three effects (Yang 2004). Household income, and therefore the ability to finance education, may rise

because remittances exceed the migrant's earnings before leaving (the income effect).⁶ Incentives to educate children may rise because parent migration increases the probability of the child migrating to a country where the return to education is higher (the aspirational effect).⁷ Finally, disruptions to family life associated with a parent leaving, for example impaired discipline or the need for children to take on increased responsibilities in the home, may reduce commitment to education (the family disruption effect). Box 1 summarizes several studies of these phenomena.

Box 1: Studies of the impact of migration and remittances on access to education in migrant-sending households

Several studies find that educational expenditures tend to be higher in remittance-receiving households than others. Examples include Kifle (2007) for Eritrea, Adams and Cuezuecha (2010) for Guatemala, Adams (2005) for Guatemala, Adams, Cuezuecha and Page (2009) for Ghana, De and Ratha (2012) for Sri Lanka, and Medina and Cardona (2010) for Colombia. However, other studies, including Cattaneo (2014) and Castaldo and Reilly (2007) for Albania, and Randazzo and Paracho (2014) for Senegal, find little difference between migrant and non-migrant households in the share of expenditures devoted to education.

Several studies find that remittances have a positive impact on the likelihood of school attendance, including Elbadawy and Roushdy (2010) for Egypt, some estimations in Acosta (2011a) and Acosta (2011b) for El Salvador, Hanson and Woodruff (2003) for Mexico, Cuezuecha (2009) for Mexico, Yang (2008) for the Philippines, Arguillas and Williams for the Philippines, Calero, Bedi and Sparrow (2009) for Ecuador, Mansuri (2006) for Pakistan, and Bansak and Chezum (2009) for Nepal. Osorio (2010) for Nicaragua, Edwards and Ureta (2003) for El Salvador and Jampaklay (2006) for Thailand reach the same conclusion, and are able to isolate the role of improved incentives for learning on higher enrolment. Bredl (2001), in a study of Haiti, finds that the impact of being in a migrant household on education is significant only for poor households, consistent with the view that remittances can ease constraints on wealth at low levels of income. Medina and Cardona (2010) find no impact of migration on the school enrolment of children left behind in Colombia. Alcaraz, Chiquiar and Salcedo (2012) for Mexico, as well as some of the above studies, find that migration and remittances have a negative impact on child labor and thus implicitly a positive impact on educational access. However, Antman (2011) finds that parental migration from Mexico is positively related to the number of hours children spend working outside the home.

The issue is further complicated because the form of migration may determine the size or sign of the impact of remittances on educational incentives. The migration of a parent to a high-status job is likely to provide a greater incentive for a child to remain in school than would parent migration to unskilled labor where the return to education is minimal or negative (see, for example, Boucher, Stark and Taylor 2005). McKenzie and Rapoport (2011) and Kandel and Kao (2001) find a perverse aspirational effect in Mexico, where the low return to investments in education for illegal emigrants to the United States (who often are limited to unskilled jobs) reduces incentives for education. As a result, children in households with a migrant tend to spend less time in school than other children.

⁶ Migration may not raise income, but rather reduce risk by diversifying income sources. Reducing the volatility of income may enable households to spend more on education by reducing precautionary savings.

⁷ Whether this actually increases the stock of human capital in the origin country will depend on whether the child actually migrates, an issue similar to that raised in the discussion of high-skilled emigration.

Other studies find that migration is associated with reduced school attendance or academic performance, presumably due to the family disruption effect. Examples include Bakker, Elings-Pels and Reis (2009) for the Caribbean, Antman (2011) for Mexico, and Robles and Ospero (2011) for Peru. Lahale et al (2009) focus on the role of more limited parental supervision in reducing school attendance in Mexican migrant households. Cortes (2015) finds evidence of the effect of family disruption in the Philippines, and further that the emigration of the mother has a larger negative impact on school achievement of children than absence of the father. But studies of Moldova (Vladicescu, Cantarji and Jigau 2008), Pakistan (Gilani 1986 and Khan 1991), the Philippines (Arcinas 1991) and India (Roy, Singh and Roy 2015) find that emigration of parents has little negative consequences for a child's development.

Coming to a definitive conclusion on this issue is further complicated by different results being generated by different control variables and statistical techniques, and the fact that only a few studies were able to separate the income and family disruption effects of remittances (Koska et al 2013). One exception is Amuedo-Dorantes and Pozo (2010), who find that remittances in Haiti have a positive impact on school attendance in households where both parents are present (so there is no family disruption effect), but a negative effect if one parent has migrated.

Sources: Inventories of studies from Koska et al. (2013) and Roy, Singh and Roy (2015), supplemented by author.

Two broad conclusions emerge from the smorgasbord of studies referred to in Box 1, despite conflicting approaches and data sets. First, the preponderance of studies find that the receipt of remittances is positively associated with expenditures on education and enrolment of children. Second, the relationship between migration and educational access may depend on income level and the institutional environment. For example, Amuedo-Dorantes, Georges and Pozo (2008) find that the impact of remittances on increasing access to education in Haiti depends on the availability of local schools, while Randazzo and Paracho (2014) find that the impact varies depending on the country's level of per capita income, as households in poor countries are less able to invest in education.

One final note concerns the disruption to education suffered by refugee children. The enrollment rate in refugee camps for primary education is 76 percent, and for secondary education only 36 percent. Girls face particularly low enrollment rates, half that of boys in the Horn of Africa. In addition, the quality of education is low: teacher training is inadequate and teacher-pupil ratios are as high as 1:70. Learning in this environment is minimal. For example, less than 6 percent of Eritrean children who were refugees in Ethiopia could read adequately by grade 4 (UNHCR 2011).

Private groups and government have played a role in increasing the developmental impact of remittances

Collective remittances and hometown associations have improved access to education in developing countries. Collective remittances and hometown associations are a common phenomenon (for example, see FMDV 2014 for Mexico and Government of Bangladesh 2004). In France alone there were 1000 immigrant associations in 2000 (Focus Migration 2006). Beauchemin and Schoumaker (2009) find that villages in Burkina Faso with hometown associations were 2.8 times more likely than others to have a primary school, while Chauvet et al (2013) find evidence that Malian HTAs have helped improve schools. Strong local community organizations are essential to ensure that funds are channeled to projects that meet local needs rather than the priorities of diaspora members.

Government incentives have helped ensure that the receipt of remittances results in greater expenditures on education. Perhaps the most famous example is Mexico's 3x1 program, under which the government matches funds provided by hometown associations and devotes them to public goods. Some evaluations have found that this program has been effective in infrastructure construction (Duquette-Rury 2014) and in increasing employment and labor force participation in Mexican communities (Cordova 2009). However, the program tends to be regressive, because the richer communities are in a better position to organize collective remittances, and political considerations have played an important role in targeting. Moreover, households may receive less family remittances with the rise in collective remittances. In any event, the program has achieved sufficient success to be copied by other countries in Central America and the Caribbean (Newland 2004).

Governments also have matched remittances used to finance educational expenditures by households. El Salvador provided matching funds for remittances that were channeled to students, which resulted in a substantial rise in expenditures on education (for each \$1 received by beneficiaries, educational expenditures rose by \$3.72), improved school attendance, and less labor supply from school-age youths (Ambler, Aycinena and Yang 2015). A pilot program in the Philippines shows that small changes can result in significant increases in the use of remittances. Providing migrants with the opportunity to label remittances as directed at education (without any means of enforcement) increased transfers by 15.3 percent. Enabling migrants to channel funds directly to educational institutions increased remittances by only 2.2 percent more (De Arcangelis et al 2014). However, these programs cover only a negligible amount compared to total remittances, the amount of remittances used to finance education, or government expenditures on education.

Governments can increase the contribution of remittances to education, and to welfare in general, by reducing the cost of remittance transfers. Remittance costs vary substantially both within and between developing regions, and average about 8 percent of the total transferred (for a \$200 transfer--World Bank and KNOMAD 2016). One benefit of supporting increased Internet access and improved telecommunications facilities would be a reduction in the cost of remittances, which are as low as one percent of the amount transferred for the most efficient agencies (World Bank 2015). Anti-money laundering and countering the financing of terrorism (AML/CFT) requirements play a significant role in keeping costs high, in part by leading commercial banks to close the accounts of smaller money transfer operators. The adoption of risk-based approaches to enforcing AML/CFT requirements would reduce remittance costs.

Governments also can use large remittances receipts to increase their access to finance (Ketkar and Ratha 2009). Brazil, Mexico and Turkey have issued bonds secured by future receipts of remittances (such future flow securitization has also been done based on exports of oil, minerals, and metals; airline tickets, credit card vouchers, and international telephone calls; oil and gas royalties; and tax revenue). Capital markets often accept a lower interest rate on such bonds than on general obligations. For example, Banco do Brasil's 2002 bond securitized by remittances from Japan was charged an interest rate 9 percentage points below the sovereign borrowing rate. The issuance of diaspora bonds, which has been done by India and Israel, also can gain financing at lower cost than regular capital market issues. Diaspora members may view origin country issues as less risky than do other capital market participants, because in the event of default on foreign currency obligations, diaspora members may be willing to use debt service provided in local currency to purchase assets or repay debt in the origin country.

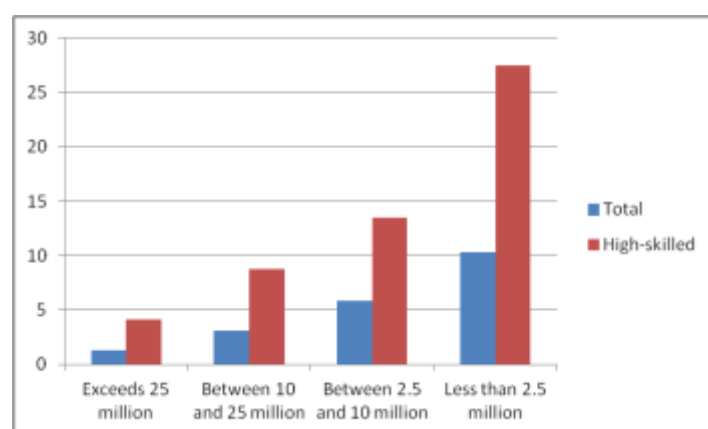
High-skilled emigration

The availability of comprehensive and timely data for high-skilled migration is much less satisfactory than for total migration or remittances. The most recent comprehensive source reports that 12 percent of developing countries' college-educated people lived abroad in 2000, up from 9.6 percent in 1990 (Artuc et al, 2014). A longer perspective shows that the rate of high-skilled emigration from developing to OECD countries was stable from 1975 to 2000, as both the number of high-skilled émigrés and the number of people attending tertiary education rose sharply in the developing world (Docquier and Rapoport 2012).

The emigration rate of high-skilled workers exceeds that of low-skilled workers

The share of high-skilled migrants that emigrate to the OECD is two to three times the share of all workers who do so, across groups of countries ranked by population size (figure 4). Similarly, the share of high-skilled workers in those migrating is about three times the share of high-skilled workers among residents (Docquier and Marfouk, 2006). High-skilled workers in developing countries may be more likely to migrate because they are more likely to have (or are better able to borrow) the resources to cover the initial costs of migration than are low-skilled workers. Belot et al. (2012) provides evidence that the cost of migration (proxied by distance), and liquidity constraints (measured by poverty rates) are positively associated with the difference between skilled and unskilled migration rates to the OECD from developing countries. High-skilled workers are more likely to be able to obtain entry (due to skill-based admission policies) and find a job in the relatively high-skilled OECD markets.⁸ High-skilled workers often have had opportunities to travel and study abroad, so they may benefit from well-established networks. Finally, high-skilled workers may be more likely to migrate than low-skilled workers because higher education typically involves learning a foreign language, and knowledge of the destination country language has an important influence on the return to education (see above).

Figure 4: Migration rates to OECD countries from developing countries are larger among high-skilled workers (emigration rate in percent, by size of population in millions, 2000)



⁸ The role of immigration restrictions in raising the high-skilled emigration rate compared to the low-skilled rate is indicated by the fact that for US immigrants, the only source country from which low-skilled workers are more likely to emigrate than high-skilled is Puerto Rico, which faces no restrictions on emigration to the United States Feliciano (2005).

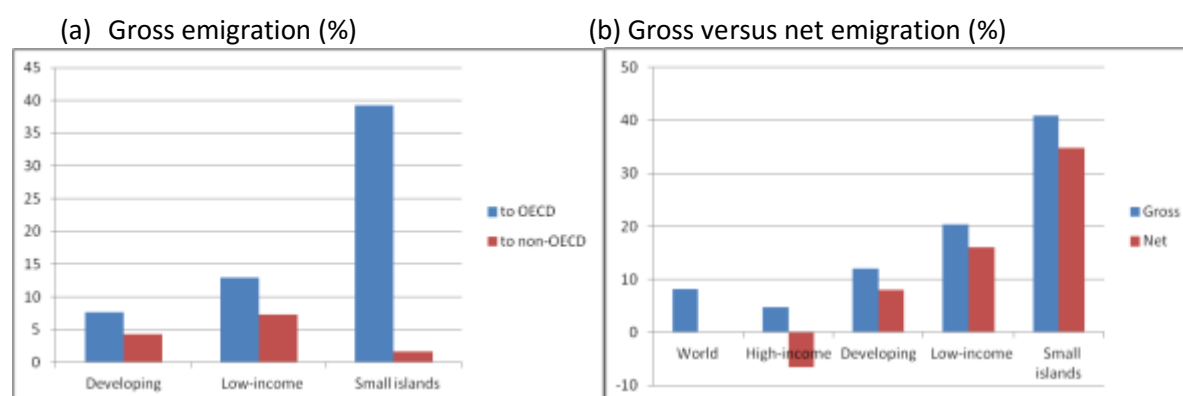
Source: Docquier and Marfouk (2006)

Whether emigration rates among high-skilled workers are higher than among low-skilled workers in the context of South-South migration is more uncertain. High-skilled workers may be more able to emigrate than low-skilled workers, but they may be more likely to choose richer destination countries. Even abstracting from the attraction of higher wages in rich countries, Ariu, Docquier and Squicciarini (2015) find that countries with strong institutions tend to attract more high-skilled emigration, because the high-skilled have stronger preferences for governance quality. Also, low-skilled workers are more likely to be driven to migrate due to climatic changes, and poorer households are more likely to be devastated by income volatility, and thus more willing to send a family member abroad to diversify earnings sources. For example, Dumont, Spielvogel, and Widmaier (2010) find that the share of skilled workers in migration to non-OECD countries is less than in migration to the OECD.

High-skilled emigration rates are the highest in poor, small countries

In 2000, more than one quarter of high-skilled workers from countries with populations of less than 2.5 million lived in the OECD (figure 4), and more than one fifth of high-skilled workers from low-income lived abroad (figure 5). High-skilled emigration tends to be large from small countries because the opportunities to practice specialized professions can be relatively limited, and from low-income countries because the investment climate tends to be poor. A staggering 40.9 percent of high-skilled workers from small island developing states lived in the OECD, although this in part reflects former colonial ties, while over time their educational systems probably adjusted to opportunities for migration. High-skilled migrants tend to locate in rich countries with high returns to skills (Grogger and Hanson 2011), as countries outside the OECD accounted for only about a third of high-skilled migrants from low-income countries. However, some of these people moved to high-income countries that are not OECD members. Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates hosted 1.4 million high-skilled migrants in 2010, or 13 percent of the total high-skilled migrants to non-OECD countries.⁹ Developing countries also received some high-skilled immigrants, as the net emigration rate in 2000 was four percentage points below the gross emigration rate (figure 5).

Figure 5: Emigration rates for college-educated people were highest in small, poor countries, 2000



Source: Artuc et al. 2015.

⁹ Based on the data used in Artuc et al. (2015), which was kindly provided by the author.

The brain drain is a subject of great controversy

Massive emigration of high-skilled workers from poor countries is a dramatic and troubling aspect of the free movement of labor in the global economy (the lack of agreement extends to determining the criteria for who is highly skilled—Box 2). While high-skilled emigration is in part a response to differences in the return to skills between origin and destination countries, often a major driver is differences in professional opportunities, for example access to research facilities, opportunities to work with experts, and opportunities for professional growth and education. High-skilled emigration also reflects the existence of networks that facilitate migration, and admissions policies in destination countries. An analysis of developing countries indicates that high-skill emigration is less sensitive to distance than low-skilled emigration, increases with the degree of religious fractionalization in the origin country, and decreases with the level of development (Docquier and Rapoport 2012).

Box 2: The definition of high skilled migrants

Defining who should be regarded as high-skilled can be difficult. National statistical authorities use three definitions, based on highest educational level achieved, type of occupation or salary level:

(i) The level of education is the most commonly used, particularly in databases relied on in academic work to draw comparisons across countries. In the data presented in the main text from Artuc et al. (2015), an individual is high-skilled if he or she has completed one year of tertiary education. The significant number of cases where highly-educated individuals work in low-skilled occupations in destination countries (usually because their qualifications are not recognized or not sufficient to land a professional job) indicate that education may be an imperfect measurement of the contribution of migration to the stock of human capital in destination countries.

(ii) National immigration authorities tend to adopt criteria for admissions that reflect their views of desirable qualifications, rather than the availability of data. Points-based admissions systems often assign higher values for higher number of years of education completed. While not usually adopted as an explicit criterion for admission, salary is often used to assess whether a job is eligible for a work permit, and potential immigrants may be awarded additional points for salaries above a certain level.

(iii) Skill level is also determined based on occupation, although classification schemes vary across countries.

Three indicators of high-skill status (at least one year of tertiary education, salary above \$100,000, and occupation as defined by the U.S. Standard Occupational Classification) are highly, but not perfectly, correlated. Lists of individuals who are considered high-skilled will differ significantly, depending on which indicator is used. In a sample of 12 million migrants, only one million were identified as high-skilled by all three definitions.

These different criteria for high-skilled admission undermine cross-country analyses of the effectiveness of immigration policies and make evaluations of the extent of high-skilled emigrants problematic.

Source: Parsons, et al. (2014)

High-skilled emigration can reduce the productivity of workers remaining in developing countries

High-skilled workers often generate economic benefits that exceed their own remuneration (Beine, Docquier and Rapoport 2008), referred to as external benefits. For example, high-skilled workers may provide guidance that increase the productivity of lower-skilled workers, the benefits of which cannot be entirely captured by the high-skilled workers (or the firms) because the low-skilled workers can move to new jobs. High-skilled workers contribute to local networks of knowledge (Agrawal et al 2008) that help to diffuse technology throughout a country. High-skilled workers may be more productive in groups due to agglomeration effects. High-skilled workers in state-supported professions such as teaching, medicine, and government administration may generate particularly large external benefits because they strongly affect the productivity of other workers (Kremer 1993). Grossman and Stadelmann (2013) find that a rise in high-skilled migration reduces wages in the origin country compared to the destination country, indicating some external benefits are generated by high-skilled workers. High-skill immigration may also reduce social capital, or the ability for individuals to cooperate and resolve conflicts due to similarities of social norms, attitudes, values, language and culture (Schiff 2004). Social capital is valuable because it can improve welfare, and may increase output through reductions in transaction costs due to higher trust and enforceability of sanctions.

High-skilled emigration can also generate benefits. . .

These potential losses must be weighed against the receipt of remittances, the contribution of the diaspora to origin country development, the return of high-skilled émigrés, and the potential for opportunities to emigrate to increase incentives for education. We will consider each in turn.

. . . through remittances. . .

Calculating the net contribution of remittances from high-skilled workers to income in the origin country is complicated. Earnings are likely to be higher in the destination country, so that household income may be higher after migration.¹⁰ Whether the share of remittances from high-skilled workers in total remittance receipts is larger than the share of low-skilled workers is unclear, since high-skilled workers generally have higher incomes and higher emigration rates than do low-skilled workers, but there are a lot more low-skilled workers than high-skilled workers. Also, high-skilled émigrés tend to spend more time abroad and have a greater potential to bring their family to the destination country, and thus may remit a lower share of earnings than do low-skilled émigrés (Faini 2007). That study, as well as Niimi, Ozden, and Schiff (2010), analyze balance of payments data on origin country remittance receipts, and find that the share of remittances in earnings is smaller for high-skilled émigrés than for low-skilled émigrés. By contrast, Bollard et al. (2011) and Sturge, Bilgili and Siegel (2016) analyze household survey data in origin countries, and find that high-skilled émigrés remit more than the low-skilled.¹¹

. . . encouraging trade and investment. . .

¹⁰ However, it is necessary to determine whether there is a net increase in income after taking into account the cost of maintaining the migrant in the destination country. Also, the welfare measure pre- and post-migration should take into account the change in household size in the origin country and the different standard of living in the destination and origin countries.

¹¹ The results in Bollard et al. (2011) are conditional on remitting (the results are more varied if households that have sent a migrant but do not receive remittances are included).

The diaspora can provide a wide variety of economic benefits to origin countries through overcoming informational barriers that impede integration into the global economy. One important channel is the role of the diaspora in increasing business opportunities for the origin country. Emigrants can boost exports from origin countries through their own demand for local goods (e.g. food products from home --Wagner, Head and Ries 2002). Also, migrants' knowledge about markets in both origin and destination countries can make them effective in connecting firms in origin countries with buyers overseas (e.g. Boly et al 2014 for Africa). Many studies have found a positive relationship between migration and trade creation. Erhart et al. (2014) find that the African diaspora plays a relatively large role in promoting African exports, perhaps because diaspora networks substitute for the particularly weak institutions on the continent. The impact is largest for highly-differentiated goods, underlining the importance of the diaspora in providing information on quality that may be more difficult for intermediaries and consumers to judge.¹²

The diaspora can increase capital flows to origin countries by establishing ties to firms in developed countries, either as intermediaries or local partners. For example, Kugler and Rapoport (2007) and Federici and Giannetti (2010) find that migration is related to increased FDI flows in origin countries. Gheasi, Nijkamp and Rietveld (2013) find a positive association between FDI flows from the UK to an origin country and the stock of migrants from the country, and that more educated migrants have a larger impact on the direction of FDI flows. And Kugler, Levinthal and Rapoport (2013) use a gravity model to show that migrants, particularly skilled migrants, can help to overcome information barriers that prevent diversification of financial instruments. Migration is found to have the largest impact on longer-term instruments (which are particularly sensitive to information) and where cultural or economic differences between source and recipient countries are large.

. . . *improving technology and institutions* . . .

A great deal has been written on the role of the diaspora in facilitating the transfer of technology to developing countries (e.g. Gibson and McKenzie 2014 for small island economies, Jonkers and Cruz-Castro 2013 for Argentina). The diaspora in rich countries can support ties to scientific networks that channel technology to developing country firms. The analysis of data on patent citations finds evidence of the diffusion of technology from rich countries to India (Agarwal et al 2011) and to the home countries of diasporas based in the United States. Hsu and Saxenian (2000) show that alumni relationships with Silicon Valley workers were critical to the development of semi-conductors in the Taipei-Hsinchu cluster.¹³ Kerr (2008) finds that technology transfers from the diaspora have a strong impact on manufacturing productivity in origin countries. And Lowell and Gerova (2004) find a high correlation between the number of US college faculty from an origin country and the share of scientific articles from that country that are co-authored by US faculty. In some professions, most notably high technology, the job market is effectively global, so that workers transfer almost seamlessly between destination and origin countries. In this context, learning and technology flows back and forth, presumably with net benefits for both origin and destination countries.

¹² Docquier and Rapoport (2012) cite several studies that have found a positive relationship between migration and trade between origin and destination countries, including Gould (1994), Head and Ries (1998), Rauch and Trindade (2002), Rauch and Casella (2003) and Combes, Lafourcade, and Mayer (2005).

¹³ Quoted in Lewin and Zhong (2013).

The diaspora can contribute to education in origin countries through financial transfers to schools, through temporary return to teach or do research, and through facilitating origin country ties to networks of educational institutions in the developed world. However, these benefits can be severely constrained by poor institutions in the origin countries. For example, while extensive, informal links exist between the African diaspora and African universities (Foulds and Zeleza 2014), poor infrastructure, a lack of resources and shortage of materials, in particular for research, and a lack of incentives and financial support impede the participation of the African diaspora in higher education on the continent (EC 2015). Similarly, Mohamoud (2005) finds that poor economic conditions, weak governance, and inadequate infrastructure, compounded by institutional defects such as excessive bureaucracy, have limited the participation of the African diaspora in higher education at home.

Diaspora-based networks also affect institutions in developing countries. High-skilled emigration may erode institutional quality and the political environment because the origin country loses people who tend to have a significant impact on political issues. However, high-skilled emigration may improve institutions if it encourages greater human capital formation (see below). Docquier et al. (2011) find that the level of emigration is positively associated with institutional quality in developing countries. Li, McHale and Zhou (2013) find that large numbers of émigrés relative to the origin country population is positively associated with the quality of domestic institutions through political networks. Spilimbergo (2009), using a dataset covering foreign students worldwide over a 50 year period, finds that foreign students tend to promote democracy upon return, but only if they were educated in a democratic country. Ivus and Naghavi (2014) find that migration results in the transfer of institutional norms such as democratic values to the home country.

High-skilled emigration can also benefit origin countries by increasing the global stock of innovation. If high-skilled emigrants make a greater contribution to global innovation abroad than at home (due to agglomeration benefits of working with a mass of highly-educated workers at the technological frontier), and if innovation tends to be disseminated rapidly, then high-skilled emigration could benefit the source country. Eaton and Kortum (2002) find that developing countries may reap greater benefits from foreign scientists and engineers than from those at home. Xu (2015) provides an empirical estimation where the benefit to India from a global increase in the emigration of high-skilled innovators to the United States is significant, albeit less than the welfare benefit enjoyed by the United States. However, the ability of developing countries to benefit from foreign technology depends on the availability of scientists and engineers to adapt technology to local conditions and integrate technology into local machines and processes. Thus, middle-income countries with a large stock of scientists are more likely to benefit from research in destination countries than are poor countries.

. . . *through return and circulation.* . . .

High-skilled emigration can generate future benefits, if émigrés return with higher levels of skills due to education or exposure to practices in more technologically-advanced countries. Return is frequent: about 40 percent of migrants leave destination countries within five years of arrival, although all may not go back to their home country (Wahba 2015). Perhaps the most famous example is the exodus of highly-educated scientists and engineers from India during the period of inward-looking industrialization. Once markets were liberalized, the return of highly-educated Indian workers made a considerable contribution to the growth of high-tech sectors. For example, Ghemawat (2000) finds that 95 percent of managers in the Banagalore Software Technology Parks were Indians who had worked abroad. Cantore and Cali (2015) find that increased productivity of temporary migrants had a more

beneficial impact on three origin countries (Ghana, Sierra Leone, and Vietnam) than did permanent migration. Case studies indicate that the return of high-skilled émigrés has played an important role in helping rapidly-growing emerging markets improve their technology, similar to the impact of diaspora networks.

It appears that the benefits are greatest if the difference in productivity levels between origin and destination countries are not too large, so that the skills learned abroad are advanced, but still appropriate given the available technology. Hussain (2014) finds that the return on government subsidies to attract a high-skill worker from the diaspora is maximized when the worker's skills are 1.28 standard deviations above the mean skill level in the country.¹⁴

Empirical studies measuring the benefit of returnees in origin countries, for example in terms of the difference in wages earned before and after migration, face difficulties because of the heterogeneous reasons for return. Many returnees come home to retire. And migrants may return both because they lack the skills to succeed in destination countries, and because they have earned their target savings level. Faini (2003) cites several articles showing that returning migrants tend to have lower skill levels than those remaining in destination countries. OECD (2008) finds that return rates were high among migrants with either high or low levels of education, while those in the middle showed the lowest return rate. In any event, the availability of data on returnees is at best piecemeal. Somewhat more pessimistically, retuning migrants often face considerable difficulties in integrating into their origin country (Dustmann 1996), implying that their productivity may not be higher than before they left, or that what they learned abroad is difficult to apply to local conditions in origin countries.

Migrants who return with a stock of savings can play an important role in relaxing credit constraints in the origin country. There is some evidence that the share of entrepreneurs among retuning migrants is higher than among non-migrants (Mesnard 2004).

Some émigrés neither remain in destination countries nor return, but rather move frequently back and forth. The rising return to skills and falling costs of transportation and communications have made temporary flows of workers commonplace (Daugeliene and Marcinkeviciene 2009). This trend is facilitated by changes in business organization, such as greater emphasis on the global sourcing of talent; the formation of on-line markets for science, technology, engineering and mathematics talent; the increasing use of technology to collaborate at a distance; and the shift towards mobile workplaces (Lewin and Zhong 2013). Circulation by highly-skilled migrants may magnify the advantages generated by the diaspora and by return, because more frequent exposure to both origin and destination countries may make it easier to exploit links between the two for trade and investment, and the dissemination of technology is easier face to face than at a distance. Further, returnees to developing countries often experience a reduction in their knowledge of cutting-edge technology in advanced countries over time, while frequent contacts can avoid this.

. . . and (paradoxically) by increasing the stock of human capital

Some authors argue that the opportunity to emigrate improves incentives for education, while a share of those educated may never end up migrating, so that high-skilled emigration actually increases human

¹⁴ The spillover effect is the parameter on the number of return migrants in an equation explaining wage rates, distinguished by occupation and location.

capital formation in the origin country (the brain gain). It is likely that the opportunity to migrate improves incentives for education; we considered this for the case of the children of migrating parents (see above). However, whether the stock of human capital increases as a result requires that a significant portion of those who consider the possibility of migration when evaluating the return to education never actually migrate. In any event, the magnitude of this effect is uncertain. Several studies find that migration opportunities stimulate human capital formation.¹⁵ By contrast, Faini (2003) finds that increases in high-skilled emigration are negatively associated with enrolment in university in origin countries. Ngoma and Ismail (2013) find the brain gain is negative in the short term and insignificant in the long term. Djajic and Michael (2014) find that the net benefits of high-skilled migration are positive only under very stringent conditions (in countries with a low emigration rate, a large gap in skills and wage levels relative to potential destination countries, and a low elasticity of the marginal utility of consumption and high elasticity of capital formation with respect to effort) that are met in only a few developing countries. These differing results likely reflect differences in models and estimation techniques, but also the differential impact of high-skilled emigration according to context.

One difficulty in measuring the relationship between demand for tertiary education and emigration rates is that controlling for other influences on the two can be problematic. The causal effect of migration opportunities could be shown more clearly if university attendance increased following an unexpected change in the opportunity to migrate. One such natural experiment concerns the sudden removal of restrictions on emigration in Eastern Europe after the fall in the Berlin Wall. From 1990 to 2000, the share of the population enrolled in tertiary education in seven Eastern European countries rose by an average of about 21 percentage points (Panescu 2004). Whether, or to what extent, this rise in university enrolment was linked to the change in the opportunity to migrate, or driven by other factors, should be explored.

The net benefit from high-skilled emigration for the source country is uncertain

The size of these effects for a particular country will depend critically on the quality of policies and institutions, for example the regulatory framework facing private sector activities, the quality of governance, and the efficiency of public sector administration. Country size matters, as small countries may offer few opportunities for workers in some specializations (see above). And this calculation of the costs versus benefits will differ at different levels of high-skilled emigration.

Calculating the net benefit of high-skilled emigration on developing countries as a group is even more challenging, given the data and modeling issues involved. Lodigiani, Marchiori and Shen (2013) find a diverse impact of high-skilled migration on growth across regions. Maria and Lazarova (2011) find that almost 70 percent of the population in their sample lives in countries that suffer from lower growth due to skilled migration. However, this group includes China and India, likely because their model does not focus on the benefits from diaspora links or return (although they do include an instrument to control for return). Since these effects have generated important benefits for China and India, as well as other large countries, the population-weighted benefit of high-skilled migration is probably underestimated. Wolf (2014) argues that the more talented workers (based on unobservable characteristics) tend to emigrate, which implies that estimates of the costs of high-skilled emigration are understated – as are estimates of the benefits from return. Mayr and Perry (2009) assume values for the parameters of

¹⁵ See, for example Beine, Docquier and Rapoport (2007 and 2008), and Easterly and Nyarko (2009).

positive and negative effects of high-skilled emigration, and find that the possibility of return migration and increased incentives for education imply that high-skilled emigration has substantially benefited Eastern Europe. Finally, Docquier (2006) concludes that a moderate level of high skilled migration (about 5 to 10 percent of graduates) may be beneficial for development, but higher levels are not.

These results (except in Wolf 2014, which is simply a judgment) are heavily dependent on the model used, and perhaps the estimation technique. In the absence of hard numbers, it is difficult to conclude that rapidly-growing China and India have suffered a reduction in growth due to high-skilled emigration, so probably on a population-weighted basis, high-skilled migration has generated a net benefit for the developing world as a whole.

It also is possible to consider the welfare effects of high-skilled emigration from the perspective of the world as a whole. This would require adding the rise in wages enjoyed by high-skilled emigrants and the external benefits from their employment in destination countries to the net impact on origin countries. The net global impact on welfare is likely positive, although large net losses in poor countries where the marginal utility of income is high could offset even larger income gains in rich countries.

Global estimates of the impact of higher migration have typically focused on all migrants, rather than just high-skilled migrants. Estimates of the impact of eliminating all restrictions on immigration include a reduction of global poverty of between 40 and 66 percent (Bradford 2012), up to a doubling of world potential GDP (Hamilton and Whalley 2004; Moses and Letnes 2004), a rise in world GDP of between 13 and 67 percent (Iregui 2005) and of between 11.5 and 12.5 percent (Docquier, Machado and Sekkat 2015), and an increase in average GDP per worker by 20 percent in the short turn, and 55 percent after 50 years (Delogu, Docquier, and Machado 2014). Van der Mensbrugghe and Roland-Holst (2009) find that a rise in migration over a ten-year period sufficient to increase the workforce in rich countries by 5 percent would raise global real income by \$1 trillion. In Walmsley, Winters and Ahmed (2007), a rise of immigration sufficient to increase industrial countries' labor force by 3 percent (in both skilled and unskilled workers) increases real incomes per capita (of permanent residents) in all regions, with the gains accruing to industrial country residents much greater than those accruing to developing country residents. In these analyses, the migrants are typically the largest beneficiaries of migration. In general, the global gains are quite significant. In addition, these studies use general equilibrium approaches that do not account for the external benefits of high-skilled workers. Integrating estimates of external benefits would likely increase the estimated positive impact of migration on rich countries, and lower the positive impact on developing countries.

Finally, the impact of the emigration of high-skilled workers, and the most efficient means of addressing it, may differ in countries where the educational system generates a lot of graduates in professions that are not required by local firms. For example, in many African countries with high rates of tertiary-educated unemployment, a large share of university students graduate in law, the social sciences or humanities, and subsequently cannot find work (AFDB 2012). While the emigration of scarce scientists and engineers may still be harmful in this environment, there may be considerable potential to adjust educational systems to produce a more appropriate mix of graduates (although the costs of providing science and technology education is higher than for law and social sciences, so the net benefit is uncertain).¹⁶

¹⁶ Complementary changes would be required to raise private sector demand for more immediately productive professions. Students enroll in law, social science and humanities because these programs facilitate landing civil

Weak policies and institutions increase the level of, and reduce the benefits from, high-skilled emigration

The choice of emigration by high-skilled workers is more sensitive to the quality of governance than for low-skilled workers (Ariu, Docquier and Squicciarini 2015), likely because the former have greater opportunities. Large rates of high-skilled emigration may reflect rampant crime (Negron 2012 for Jamaica) or reduced return to education due to economic crisis (see, for example, Kwenda and Ntuli 2014 for Zimbabwe). The impact of the domestic environment is most spectacularly illustrated by the very high rates of high-skilled emigration from countries afflicted by civil war (Bang and Mitra 2012). The massive loss of professionals is clearly a calamity for these desperately poor countries, and the benefits of high-skilled emigration cited above will be limited until peace can be restored. Reducing high-skilled emigration rates from countries suffering from violence can only be addressed by resolving the conflict. More generally, while ‘improve your institutions’ is not a very helpful policy recommendation, it is useful to remember that the phenomenon of high-skilled emigration is not exogenous to conditions in origin countries.

Case studies indicate that the contribution of the diaspora to growth depends critically on government efforts and the strength of the investment climate in the origin country. For example, Saxenian (1999) shows how government recruitment and rapid growth in Taiwan attracted transfers of technology and the formation of business ties with the diaspora. China’s success in attracting investment and trade through overseas communities, and India’s efforts to attract investment, technology and demand for outsourcing services (Newland 2004), were supported by a liberalization of constraints on private sector investment, rapid growth in demand, and special incentives for diaspora members.

More general studies emphasize the importance of the quality of domestic institutions for benefiting from connections to the diaspora. Strong intellectual property rights in the origin country can help attract investment and business involvement from the diaspora (Nagavi and Strozzi 2015). The greater the return to skills and better the growth prospects in origin countries, the higher the share of émigrés that return (Docquier and Rapoport 2012). An appropriate macroeconomic environment is necessary to underpin innovative approaches to obtain financing from the diaspora, for example the use of diaspora bonds in Ghana to fund a medical school (Ketkar and Ratha 2011).

The rate of high-skill emigration may affect the return on government educational expenditures

Countries with large high-skilled emigration rates face a dilemma in educational policy. The net benefit of high-skilled emigration is likely negative at large rates of high-skilled emigration (see above), so the return to investments in higher education is uncertain. Moreover, in most countries more wealthy individuals tend to participate more in higher education, and have greater opportunities for working abroad (due to networks and ability to cover the initial investment required to migrate). The spectacle of devoting large government resources to launch the careers in Europe or the United States of rich children is particularly galling for societies in poor countries. Developing countries may be considering emigration rates in determining expenditures on education: Docquier, Faye and Pestieau (2008) find

service jobs, while inappropriate regulations stifle private sector growth and thus the demand for scientists and engineers.

that in a sample of 108 developing countries, the level of education subsidies is negatively associated with skilled emigration rates.

One qualification is that a significant number of highly-educated migrants from developing countries earned their degrees abroad: according to Beine, Docquier and Rapoport (2007), 32 percent of high-skilled emigrants from developing countries left before the age of 19. In a more detailed assessment of doctor migration from Africa, Ozden and Phillips (2015) find that almost half of African-born doctors were trained outside of their country of birth. While the emigration of highly-talented but young individuals may still represent a loss, at least those emigrating at a young age have not relied on government expenditures at the university level.

Various efforts have been made to restrain emigration of the graduates of publically-funded universities, which tend to dominate higher education in poor countries. These efforts often have been ineffective or counterproductive. Outright bans on emigration are viewed as human rights violations, tend to be easily circumvented in the absence of draconian enforcement procedures, may increase the emigration of more talented young people to gain education abroad, and for those escaping may discourage return and networking, thus eroding a major benefit of emigration for the origin country. Countries affected by weak governance or conflict are likely to face the greatest difficulties in restricting emigration, but also face the most severe shortages of high-skilled workers.

More common are service requirements, largely for medical professionals. These have included requirements that doctors work for the government and requirements to work in particular (usually rural) areas, for example as a condition of receiving training, a license to practice, or certain incentives. These requirements are open to milder forms of the objections listed above to emigration bans. For example, requirements in South Africa and Nigeria that medical school graduates undertake a year of community service may have contributed to the rise in emigration immediately following graduation (Physicians for Human Rights 2004). Seventy countries have, or have had, some form of compulsory service requirements for health workers. Some of these programs have improved services in the targeted areas, according to a survey of government officials (Frehywot et al. 2010), although the implications for evasion of service requirements are not considered. In any event, governments should aim to encourage a long-term relationship with high-skilled émigrés, which may be more beneficial than a relatively short commitment to a job that is viewed as unsatisfactory by the graduate. On the other hand, integrating service in rural communities into medical programs could improve health in rural areas while providing what may be viewed as useful experience to students.

There has been considerable discussion of the proposal by Bhagwati and Dellarf (1973) that developing countries be paid a share of taxes on their high-skilled émigrés in rich countries, either through administrative measures overseen by the UN or by developing countries' taxing the income of citizens abroad (similar to US practice). While such taxation may be viewed as reasonable compensation for origin countries' investment in the upbringing or education of émigrés, either form would require cooperation from rich countries' tax administrations.

Alternatively, agreements between origin and destination countries could enforce payments to origin countries from émigrés who benefited from publically-financed university education. All major destination countries would have to participate, to avoid diverting high-skilled migration flows to non-participants. Such agreements may not greatly affect the level of high-skilled emigration, given the very large returns involved. However, they could encourage more talented individuals to emigrate after

graduating from secondary school, which would save origin country resources but could also reduce ties to the origin country. It is unclear whether having to compensate the origin country for university education could reduce the interest of diaspora members in contributing to origin countries.

International agreements to compensate origin countries for the education of émigrés would be more easily enforced (assuming destination country cooperation) than unilateral measures. Agreements also would be a less costly approach, since evasion by high-skilled migrants of unilateral measures would discourage ties to the diaspora and return.

Another approach to cost recovery, which could be feasible for some developing countries, would be to encourage rich country students to matriculate in their universities, perhaps through improving standards in specialized areas. One example is the significant numbers of US students in Caribbean medical schools (see below). Rich country students probably could be charged more than the full cost of their education, given the high cost of university training in many rich countries, which would lower the per student fixed costs involved in creating adequate facilities and attracting competent teachers.

Governments have faced difficulties in establishing links to, and encouraging the return of, high-skilled émigrés

Government support for the establishment of migrant networks, for example through holding professional meetings and establishing a website to maintain communications with the diaspora, can be useful in cementing ties. Barrufaldi and Landoni (2012) show that efforts to maintain the high-skilled diaspora's ties to the home country can increase the probability of return, as well as the productivity of scientists in destination countries. EC (2015) advocates a series of policies to strengthen diaspora ties with African universities, including the establishment of government offices to manage diaspora policy, maintaining databases on African alumni, efforts to promote a more welcoming environment in African universities towards diaspora members, and improved incentives for alumni participation. However, Lowell and Gerova (2004) question the effectiveness of some government efforts in this regard. Of the 15 diaspora organizations found on the Internet established with government support (out of 61 total), four of these were either no longer locatable, or had not been updated for several years.

Several countries have offered incentives to encourage the return of high-skilled émigrés. For example, Argentina's RAICES program supports short term return of scientists (Jonkers 2008). China has provided a host of incentives for return, including housing, education, protection of returnees' intellectual property rights, the designation of special economic zones reserved for returnees, and temporary positions in Chinese research institutions (Jonkers 2008). Korea provides incentives to return, which vary depending on the destination country (Mylonas 2013). The IOM's Return of Qualified African Nationals program (which evolved into the Migration for Development in Africa program) placed about 2000 people in 41 African countries over the period 1974-90 (IOM 2005). The Philippines Overseas Foreign Worker program provides training in entrepreneurship, in addition to other services (Torrea 2003). Incentives have included cash, tax exemptions, salary supplements, training, subsidized loans, support for placing children in school or finding employment for the returnee or his/her spouse, and housing assistance.

These programs have been subject to several defects. Typically, only a small number of people have participated, owing to the costs involved. It is unclear whether the incentives provided were critical to the decision to return. It is possible that beneficiaries emigrate again after receiving the subsidy, and

some people may have emigrated in order to receive the subsidy (although this seems unlikely and controllable). Non-migrant colleagues may resent returnees who benefited from higher pay or seniority as a result of having left the country (Dumont and Spielvogel 2008). This seems to have been an issue with China's program, particularly since many overseas Chinese benefited from preferences without spending much time in China. Overall, however, China has been very successful in attracting returnees, in part due to the broad improvements in socio-economic conditions (Jonkers 2008).

Available evaluations are not rigorous, and are largely based on surveys of participants asking if they felt the programs contributed to development and were important in the decision to return (McKenzie and Yang 2015). A UNDP program that has provided incentives for temporary return to 5000 high-skilled émigrés over 20 years (Dumont and Spielvogel 2008) has had mixed results (Wanigaratne 2006). A program to encourage Afghans to return from Norway resulted in some successful businesses, but mostly served as a means of obtaining cash grants, followed by re-emigration (Strand et al 2008). The Temporary Return of Qualified Nationals to Afghanistan (Kuschminder 2013) had some positive effects, but the time period was short and the overall impact unclear (McKenzie and Yang 2015).

Rich countries, for example France and Germany, also have attempted to provide incentives for return of their immigrants to origin countries. Similar to efforts by developing countries to attract return, these have had a limited impact. Dustmann (1996) finds that the relationship between the provision of assistance and the decision to return among participating German immigrants is not significantly different from zero.

Overall, while the government can and should play a role in facilitating return through providing information, maintaining contacts with émigré organizations, and limiting bureaucratic requirements, large expenditures devoted to paying people to return are problematic.

Changes in regulation and administrative arrangements can also facilitate return. Recognizing qualifications gained overseas would remove one barrier to return in some countries (Gibson and McKenzie 2012). Provision for dual citizenship (both allowing émigrés to keep their origin country citizenship and allowing returnees to keep their destination country citizenship) helps maintain émigrés ties with the origin country, facilitates travel, and encourages investment in countries that impose restrictions on foreign investment or favor investment by citizens over foreigners. Also, émigrés may find it difficult to gain appropriate positions in public service jobs that base remuneration and the level of responsibility on seniority (see Anh 2003 for the example of Vietnam). Changes in civil service rules to recognize the experience gained in similar positions overseas might help encourage émigrés to return for public sector jobs. At the local level, investments in digital infrastructure by Bangalore and Hyderabad have helped to support the frequent movements between them and Silicon Valley (Daugiliene and Marcinkeviciene 2009).

Rich countries also have faced difficulties in managing skilled migration

Observers have criticized rich countries for a lack of 'policy coherence', in the sense that decisions on migration policy are largely based on domestic considerations rather than their developmental impact (Keijzer et al. 2016). Admissions policies in many industrialized countries are designed to increase the admission of skilled workers, which may have improved the skills mix, although evidence is not conclusive (Bertoli and Rapoport 2014). It is possible that the impact of preferences for skills is confounded by other policies. For example, admitting a large share of immigrants on the basis of family

reunification may result in a relatively low-skilled mix of entrants (Parsons et al 2014). There is little question, however, that migrants have made an enormous contribution to technological advances in rich countries, in particular in the United States.

Rich countries have had more success in using visa systems to encourage the recruitment of health care workers to meet increased demand for health care. Examples include the US H-1C visa program for nurses, and the use by Australia and the United Kingdom of a list of occupations in demand (including health care workers) to determine preferences for entry (Ahmad 2005). Similarly, Kovacheva and Grewe (2015) attribute the rise in foreign nurses and doctors in Germany to policies in the 2000s that increased opportunities to migrate for health care workers, improved access of foreigners to German education, and increased the recognition of foreign professional qualifications. Some developing countries, such as the Philippines and India, train an excess number of doctors in order to benefit from the remittances of émigrés (Forcier, Simoens and Giuffrida 2004), but recruitment of scarce healthcare workers may have exacerbated shortages in many poor countries, particularly in Africa (Naicker et al. 2009).

In 2010, the World Health Assembly adopted a global code on the recruitment of health care workers, which encourages countries to train adequate numbers of health professionals to meet their own needs. Since 2010, however, the share of foreign-trained doctors in the health systems of Canada, France, Germany, New Zealand and the United Kingdom has risen, and the share in the United States has remained stable (although the number has continued to rise) (OECD 2015). While most foreign-trained doctors in the United States and the United Kingdom do not come from regions where outflows of health care workers are particularly damaging (Africa accounts for only 6 percent of foreign-trained doctors in the United States and 8 percent in the UK),¹⁷ these levels of recruitment may be significant in terms of origin countries.

Governments appear to have had little success in limiting the emigration of teachers

The emigration of teachers is of particular concern in discussing the links between migration and education. Teachers are often trained at government expense, their pay is often set by government, and their salaries are unlikely to be strictly related to the contribution they make to the future earnings of their students. Thus, the external benefits of teachers, and the subsequent loss from their emigration, may be quite large.

The international movement of teachers has no doubt increased significantly over the past few decades (Bense 2016), although comprehensive data are not available. The increase in the average age of teachers, the decline in status and pay of the profession, and expanded employment opportunities for women in other sectors have impeded recruitment into the profession and driven increases in pupil/teacher ratios in several industrial countries. Since the 1990s, industrial countries have aggressively recruited teachers, including from developing countries (Matimba 2016). Iredale, Voigt-Graf and Khoo (2012) provide examples of such activities in several rich countries (see above for visa practices used to attract nurses, which would have similar affects for teachers).

¹⁷ More than 10 percent of US doctors were trained in the Caribbean Islands, but many of these were US students who studied abroad.

. Rich country governments have been criticized for their active recruitment of teachers from developing countries. The Commonwealth Protocol is an attempt to balance the right of teachers to migrate with protecting the integrity of education systems in developing countries. The effectiveness of the protocol was viewed as uncertain because it lacks legal authority (Miller et al 2008). A 2008-09 review of the implementation of the protocol concluded that most migrant teachers were unaware of it, and data on the recruitment of teachers was not being collected by Ministries of Education. A follow-up review in 2011 indicated that information about the Protocol had not increased (Ochs 2012).

Teferra and Altbach (2004) detail the loss of professors from public universities in many Sub-Saharan African countries, including to the local private sector, private universities, and abroad. For example, perhaps 50 percent of Ethiopian college teachers have left the profession or gone abroad, and some 10,000 Nigerian academics may be living in the United States. Many academics have migrated in search of better pay and working conditions, and a significant number have fled violence and persecution.

The flow of teachers at the university level is not exclusively from developing to rich countries. In particular, higher-income countries in developing regions tend to be magnets for scholars from nearby, lower-income countries. Thus, Mexico and Brazil attract professors from other Latin American countries, African academics seek out employment in South Africa, Botswana and Namibia, (while the best South African professors are moving to rich countries), and Indians and Pakistanis go to Southeast Asia (Altbach 2004). This phenomenon is similar to the more well-documented case of doctors, who tend to move around the world in response to shortages that appear in individual countries, including developing countries. For example, Bundred and Levitt (2000) describe how flows of doctors compensate for shortages, including by the movement of doctors from poor to middle-income countries. Thus, statistics on the number of teachers living in rich countries may not provide a full picture of the impact on middle-income countries of the global migration of teachers.

Issue also has been taken with the activities of teacher recruitment agencies. The failure to regulate their activities has increased the risk that teachers will be exploited (Cavaratti et al. 2014). Recruitment agencies in the United Kingdom often fail to provide adequate information to either schools or prospective teachers (de Villiers and Books 2009). And teachers recruited by agencies may face difficulties on arrival, including that contracts don't provide the same terms as promised or don't exist at all, or that the nature of the position was misrepresented (Reid, 2006).

Case studies show that the emigration of teachers can be, but is not necessarily, associated with growing scarcity of teachers and reduced quality of education. The substantial emigration of teachers from Jordan did not significantly reduce teacher/pupil ratios (Zaqqa 2006). Appleton, Morgan and Sives (2006) conclude that the emigration of teachers did not appear to lead to harmful shortages in Jamaica and South Africa. However, the more effective teachers may have left. Interestingly, the emigration of teachers can be largely temporary, as a survey of teachers from developing countries in the United Kingdom found that only 38 percent intended permanent settlement there. While some Ghanaian secondary school teachers emigrated, most primary school teachers did not because of inadequate qualifications (Cobbold 2015).

On the other hand, Brown (2008) finds that emigration of teachers may have reduced the quality of education in SADC countries, leading to the employment of unqualified teachers. Sinyolo (2007) finds that migration was an important cause of teacher attrition in southern Africa, with most of those leaving being instructors in science or mathematics at the secondary school level, who are particularly scarce.

And Sharma (2012) cites a shortage of teachers in India during a period of rising teacher emigration. Miller, Ochs and Mulvaney (2008) find that emigration is common during the school year, which is disruptive to education in origin countries. And Rudder (2012) points to efforts by Barbados to urge rich country governments to desist from teacher recruitment as evidence of the deleterious impact of emigration there.

The policy issues facing countries experiencing high levels of teacher emigration, such as the optimum level of educational expenditures, the impact of limits on the emigration of teachers who benefited from state subsidies, and the effectiveness of service requirements, are similar to those for high-skilled emigration in general (see above). However, in teaching there is often a tight connection between training received and the ultimate job,¹⁸ which opens up other opportunities for control. For example, In Ghana teachers sign a bond guaranteeing that they will remain in their initial posting for three years, which is equivalent to the period of their training. If they leave earlier than that, they are barred from further public sector employment and the guarantor must pay the bonded amount. Apart from difficulties teachers may confront in finding a guarantor, this system has not worked very well because high inflation has reduced the real value of the bond and enforcement has been weak (Sinyolo 2012). Barbados places limits on which teachers are granted leave to work overseas, which are only effective if teachers are committed to returning. (Ochs and Jackson 2009).

Low-skill and south-south migration

Low-skill emigration can have a substantial impact on wage levels in developing countries

Typically, we can expect that large rates of low-skilled migration will result in a rise in the wage levels for low-skilled workers or a decline in low-skilled unemployment. Welfare may rise due to higher household income from remittances. Given barriers to migration, including distance, costs of migration, and impediments established by rich destination countries, coupled with the large supply of low-skilled workers in origin developing countries, these effects on wages are generally small in the short run. Over time, emigration of low-skilled workers may be large enough to significantly increase origin country low-skilled wages, thus improving the welfare of the poor while increasing incentives for investment in mechanization to substitute for the increasing scarcity of low-skilled workers. Increased mechanization will raise the demand for high-skilled workers to build and service the machines, thus increasing incentives for education and raising the skill level of the workforce.

The magnitude of low-skilled emigration may be small in the short term but significant over many decades, and the impact of low-skilled emigration on origin country wages and growth is likely to be different at different stages of the developmental process. Thus, it is hard to capture the full impact of low-skilled emigration in empirical studies that cover relatively short time periods.

Low-skilled emigration did have a significant impact on wages in origin countries during the mass migration to the new world before the First World War. In a sample of 17 origin and destination countries, the average wage for unskilled workers in the new world was 136 percent higher than in the old world in 1870. By 1913, the average wage for unskilled workers (adjusted for inflation) was only 87

¹⁸ Some countries have teacher training programs whose graduates are then channeled into public teaching careers.

percent higher in the new world (Chiswick and Hatton 2001). A computable general equilibrium modeling exercise calculates that in the absence of migration, the difference between wages in Great Britain and the United States would have doubled from 1870 to 1913, when in reality the gap fell by one-fifth (Hatton and Williamson 1998). Abramitzky, Boustan and Eriksson (2013) find that the poor were more likely to migrate than the rich during this period of open migration. Thus, very large low-skill emigration flows reduced poverty both by raising low-skilled wages and by offering the poor better prospects in working overseas.

Some studies have found increases in low-skilled wages due to low-skilled emigration in contemporary times as well. Wages in the Philippine manufacturing sector increased with large emigration flows, and the wages of low-skilled construction workers in Pakistan rose with emigration to the Gulf (Lucas 2005). However, Katselli, Lucas, and Xenogiani (2006) show that several countries with large flows of low-skilled emigrants experienced limited wage growth and high rates of unemployment during the 1990s through the early part of this century. Thus, in some cases even relatively large outflows of low-skilled workers may not be large enough to appreciably affect labor market conditions (or alternatively, poor governance or other factors reduced the demand for labor as people exited).

There is one major exception to this benign view of low-skilled emigration. In some origin countries and communities, massive low-skilled emigration has so depleted the labor force as to reduce the productivity of factors of production that complement low-skilled labor, principally land. Some villages in Bulgaria, Romania and Ukraine have become almost depopulated, with children and the elderly the remaining inhabitants (Sauer, Gorton and Davidova 2014). The authors find that outmigration, including domestically and to other countries, from rural areas of Kosovo resulted in reduced productivity of farms. Increased remittances supported the incomes of people left behind, although only a small share of remittances was devoted to investment in farm improvements. In general, massive low-skilled emigration may also imply massive remittance receipts and thus higher household income, although such large inflows may erode incentives to work and thus further reduce production. For example, Azam and Gubert (2006) find that large remittances reduced incentives for work in some communities in the Senegal River Valley (in Mali and Senegal), although this largely reflected internal migration.

Neither reduced incentives for work nor lower technical efficiency are likely problems in very large emigration flows from more densely-populated areas. Hasan (2010) claims that the large emigration from rural areas of Pakistan reflected the transformation of agriculture into a capital-intensive industry, so that changes in the efficiency of production were driving migration, rather than emigration affecting efficiency. In China, demand for labor in the cities resulted in some 'empty villages' in mountainous regions, but this reduced poverty because the poorest people and those living in the most adverse conditions were most likely to leave (Wu and Yao 2010).

Large outflows of migrants also may reduce the agglomeration benefits generated by concentrations of people for both firms (by reducing the size of demand that can be reached at low transport cost, impeding manufacturing plants' ability to reach efficient scale) and consumers (by reducing the variety and increasing the cost of goods and services that are readily available). However, these channels are difficult to measure.

Massive emigration of low-skilled workers can occur in communities due to networks that facilitate migration (McKenzie and Rapoport, 2011). Such large outflows can significantly affect wage levels, work incentives, and even the viability of communities. The size of this impact will depend on the degree of

integration of domestic labor markets. If workers readily move in response to rising wages in communities affected by massive outmigration, then the benefits will be shared with neighboring communities and the costs will be minimized. The limited evidence indicates that the responsiveness of workers to emigration-induced increases in wages in other communities varies throughout the developing world (e.g. labor markets appear poorly integrated among Indian states, well-integrated in Bangladesh, and generally well-integrated across Sub-Saharan Africa--Katselli Lucas and Xenogiani 2006).

Finally, massive emigration from areas that were disrupted by conflict or environmental disaster, or where the people leaving were subjects of persecution, represents an obvious benefit for the migrant and should not be viewed as an exogenous impact on the area involved.

South-South migration has somewhat different effects than South-North migration

Income levels in the developing world are quite diverse, and the impact of immigration in, say, Thailand may be more similar to that in the United States than that in Sierra Leone. Nevertheless, it is helpful to explore how our conclusions may be altered in the case of South-South migration flows.

South-South migration may generate smaller increases in earnings than South-North migration. While income differentials within the developing world can be quite large, almost 80 percent of South-South migration occurs between contiguous countries, and the bulk of flows are between countries with similar levels of income (Ratha and Shaw 2007). Nevertheless, the welfare gains for South-South migrants may be substantial, as increments to income have a greater welfare effect at low levels of income, and for many poor people migration is a critical strategy for diversifying the risks of income volatility (Bladewell 2009). Temporary migration likely accounts for a larger share of South-South than North-South migration, given that cross-border movements to contiguous countries may be driven by short-term jobs in nearby urban centers. Migrants forced to move due to violence or ecological disasters also tend to move to neighboring countries rather than far away. Despite the considerable attention paid to the Syrian refugee crisis in Europe, most of the 4.8 million Syrian refugees remain in the Middle East (World Bank and KNOMAD 2016). As with South-North migration, moving to improve one's education is a common motivation (see Black, Hilker and Pooley, 2004 for East Africa and Hugo 2005, for Asia).

South-South remittances probably play a smaller role in improving access to education than South-North remittances, at least in low-income countries. Households who have sent a migrant to another developing country are often extremely poor, so that remittances must be devoted to subsistence needs rather than invested. For example, Pendleton et al. (2006) find that remittances to five southern African countries from migrants within the region have little developmental impact, but make a critical contribution to poverty alleviation.

While diaspora policies in developing countries are often oriented to rich countries, the diaspora in developing countries may also be in a position to assist development. Networks based on ethnic ties are common in the developing world, for example the Indians in East and South Africa and the Chinese in Southeast Asia. Of course, migrants in other developing countries are likely to have less resources to support origin countries than migrants in rich countries do. On the other hand, migrants in other developing countries may be closer to origin countries, more knowledgeable about the problems that local communities face, and more willing to assist than diaspora groups that are further away.

South-South migration is often more similar to internal migration than to international migration. The distance, and the change in culture and language, facing a worker who moves from northern Benin to her extended family in Nigeria is likely to be less than that from moving to Cotonou. The experience of herders who routinely cross borders in response to seasonal changes in the availability of feed is likely to be little different from herders who move within a single country. More generally, individual movements to nearby countries, particularly poor countries that have ineffective border controls, may have similar implications as rural-urban migration within a country. Of course, other South-South migration flows occur at long distance or between countries with very different levels of income, and thus are more similar to South-North migration.

South-South migration to neighboring countries, however, is typically much smaller than rural-urban migration within a country. The migration of workers from the countryside in the context of massive increases in urban populations in Africa, Latin America and Asia¹⁹ has placed an enormous strain on the ability of governments to ensure minimum levels of water, sanitation, and power, and has been accompanied by high levels of urban unemployment and pressures on low-skilled wages in some contexts.²⁰ Nevertheless, while the resulting tensions may stir resentments based on intra-country differences in ethnicity and culture between urban and rural dwellers, these are likely to be muted in comparison to the potential for conflict, and the demands for exclusionary policies, arising between immigrants and natives.

Conclusion

As the return to skills has increased rapidly over the past few decades, much of the controversy surrounding migration has focused on the interplay between migration and education. This paper has provided a stock taking of the main findings of economic research on this issue. One general conclusion is that migration has generated enormous benefits for developing countries, although the migrants themselves have probably garnered the largest increase in welfare. Another is that in countries with strong policies and institutions, the stock of human capital and access to technology tend to rise with migration. In contrast, in countries with weak policies and institutions, migration may provide essential income support for households, although other benefits for the origin country are limited. Note that the countries that have enjoyed substantial benefits from high-skilled migration, such as China, India, and the Philippines, represent a lot more people than the poor African or Caribbean countries that have likely suffered net losses. This is important in evaluating the benefits to migration for the world as a whole, although it does not make the issues facing the second group of countries any less pressing.

We have offered several recommendations for migration policies that could improve its developmental impact, as listed below. However, these policies can only complement general improvements in the policy framework, not substitute for them:

¹⁹ In Africa, the explosive growth of cities has been more due to natural population increase and the reclassification of rural areas than rural-urban migration, although the latter also has contributed (Kessides 2005).

²⁰ Models developed by Todaro (1980) and Todaro and Harris (1970) show that continued rural-urban migration is consistent with high unemployment rates in urban areas if the differences in wages are large and the probability of securing a job not too small, particularly as migrants' calculation may cover expected income over a long period.

--Language training and employment subsidies can improve the employment prospects for migrants, although the lack of rigorous evaluation and limited number of successful examples caution against large, ambitious programs.

--Governments can improve the benefits of migration by reducing the cost of remittance transfers.

--Governments can help encourage ties to the diaspora, although to the extent possible it is preferable to rely on private sector organizations.

--Government support for collective remittances is most effective when strong local community organizations ensure that projects meet local needs.

--Governments can improve their access to finance by issuing bonds directed at the diaspora and by securitizing future remittance receipts.

--Policies that limit the emigration of university graduates are often ineffective or counterproductive, and tend to reduce the benefits of high-skilled migration.

--Subsidies to encourage return are subject to round-tripping, may have been unnecessary, and have stirred resentment in other workers. However, these programs may be effective in countries with good prospects for growth.

--Allowing dual citizenship and facilitating recognition of qualifications gained overseas could encourage return.

--Stronger regulation of recruitment agencies for migrant teachers could protect teachers while helping to improve the match between jobs and hires in destination countries.

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List of Abbreviations

AML/CFT	Anti-Money Laundering/Countering the Financing of Terrorism
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GNI	Gross National Income
ILO	International Labour Organization
IOM	International Organization for Migration
KNOMAD	Global Knowledge Partnership on Migration and Development
ODA	Official Development Assistance
OECD	Organization for Economic Cooperation and Development
RAICES	Red de Argentinos Investigadores y Científicos en el Exterior
SADC	Southern Africa Development Community
UK	United Kingdom
UN	United Nations
UNDP	United Nations Development Program
UNHCR	United Nations High Commissioner for Refugees