In this paper, the author selectively reviews academic literature on the causes and consequences of emigration from developing countries. His aim is to identify facts about international migration that are relevant to those concerned about why labor moves between countries and how these movements affect sending-country economies. Empirical work on global labor flows is still in an early state. As is often the case, the literature provides incomplete answers to some of the most urgent questions. Nevertheless, recent work yields a number of robust results and is helpful for identifying where future research should be directed.

Gordon H. Hanson, Professor of Economics, University of California, San Diego
International Migration and Development

Gordon H. Hanson
About the Series

The Commission on Growth and Development led by Nobel Laureate Mike Spence was established in April 2006 as a response to two insights. First, poverty cannot be reduced in isolation from economic growth—an observation that has been overlooked in the thinking and strategies of many practitioners. Second, there is growing awareness that knowledge about economic growth is much less definitive than commonly thought. Consequently, the Commission’s mandate is to “take stock of the state of theoretical and empirical knowledge on economic growth with a view to drawing implications for policy for the current and next generation of policy makers.”

To help explore the state of knowledge, the Commission invited leading academics and policy makers from developing and industrialized countries to explore and discuss economic issues it thought relevant for growth and development, including controversial ideas. Thematic papers assessed knowledge and highlighted ongoing debates in areas such as monetary and fiscal policies, climate change, and equity and growth. Additionally, 25 country case studies were commissioned to explore the dynamics of growth and change in the context of specific countries.

Working papers in this series were presented and reviewed at Commission workshops, which were held in 2007–08 in Washington, D.C., New York City, and New Haven, Connecticut. Each paper benefited from comments by workshop participants, including academics, policy makers, development practitioners, representatives of bilateral and multilateral institutions, and Commission members.

The working papers, and all thematic papers and case studies written as contributions to the work of the Commission, were made possible by support from the Australian Agency for International Development (AusAID), the Dutch Ministry of Foreign Affairs, the Swedish International Development Cooperation Agency (SIDA), the U.K. Department of International Development (DFID), the William and Flora Hewlett Foundation, and the World Bank Group.

The working paper series was produced under the general guidance of Mike Spence and Danny Leipziger, Chair and Vice Chair of the Commission, and the Commission’s Secretariat, which is based in the Poverty Reduction and Economic Management Network of the World Bank. Papers in this series represent the independent view of the authors.
Acknowledgments

I thank Roberto Zagha and Ravi Kanbur for helpful comments.
Abstract

In this paper, I selectively review academic literature on the causes and consequences of emigration from developing countries. My aim is to identify facts about international migration that are relevant to those concerned about why labor moves between countries and how these movements affect sending-country economies. Empirical work on global labor flows is still in an early state. As is often the case, the literature provides incomplete answers to some of the most urgent questions. Nevertheless, recent work yields a number of robust results and is helpful for identifying where future research should be directed.
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International Migration and Development

Gordon H. Hanson

1. Introduction

A decade ago, trade and investment liberalization dominated the global economic policy agenda. The WTO had recently been created, the United States, Mexico and Canada were implementing NAFTA, and much of Southeast Asia and South America were near the peak of an economic boom that was driven in part by greater openness to inflows of foreign capital. In bilateral and multilateral discussions of economic integration, global migration was often missing from the docket entirely.

Today, international labor flows are seen as an integral part of the process of globalization. Between 1990 and 2005, the number of individuals residing outside of their country of birth grew from 154 million to 190 million, reaching a level equivalent to 3 percent of the world population (United Nations, 2005). In many developing countries, emigration rates have increased dramatically. Between 1990 and 2000, the fraction of the adult population living in OECD countries rose from 30 percent to 35 percent in Jamaica, 14 percent to 20 percent in El Salvador, 8 percent to 13 percent in the Dominican Republic, 8 percent to 12 percent in Mexico, 7 percent to 12 percent in Haiti, 4 percent to 8 percent in Honduras, and 2 percent to 6 percent in Ecuador.2

The growth in labor flows from low-income to high-income countries has not been greeted with universal enthusiasm, either by policy makers or academics. In theory, international migration increases economic efficiency by shifting labor from low-productivity to high-productivity environments. As workers move from Central America to the United States, North Africa to Europe, or Southeast Asia to Australia, the global labor supply shifts from labor-abundant to labor-scarce economies, compressing international differences in factor prices and raising global GDP. Migrants enjoy large income gains

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2 See Docquier and Marfouk (2006). Adults are those 25 years and older.
(Rosenzweig, 2007), family members at home share in these gains through remittances (Ozden and Schiff, 2006; Fajnzylber and Humberto Lopez, 2007), and non-migrating workers in the sending country enjoy higher wages thanks to a drop in local labor supply (Aydemir and Borjas, 2007). What is not to like?

One source of dissension is that international migration redistributes income within and between countries. It thus comes as no shock that inflows of foreign labor provoke political conflict and have become a frequent topic of debate in labor-importing countries. More surprising, perhaps, is that economists are often among those criticizing migration. In the literature, one finds two broad complaints. In low-income sending countries, the concern has long been that the wrong individuals leave (e.g., Bhagwati and Hamada, 1974). In most of the developing world, the more skilled have the highest propensity to emigrate. If there are positive spillovers associated with accumulating human capital (Lucas, 1988) or education is public and financed through taxes (Bhagwati and Rodriguez, 1975), then the emigration of skilled labor can undermine economic development (Benhabib and Jovanovic, 2006). Possible corrections include taxing the emigration of skilled labor (McHale, 2007) or having receiving countries admit more unskilled workers from the developing world (Pritchett, 2006).

In high-income receiving countries, the complaint is that the wrong individuals are arriving (Borjas, 1999a). In the United States and Europe, the average immigrant has much less schooling than the average native worker (Boeri, McCormick, and Hanson, 2002). If immigrants have low income relative to natives, increased labor inflows may exacerbate distortions created by social-insurance programs or means-tested entitlement programs (Borjas and Hilton, 1996; Wellisch and Walz, 1998), fueling political opposition to immigration (Hanson, Scheve, and Slaughter, 2007). Most rich receiving countries tightly restrict immigrant admissions, in contrast to their pro-liberalization stances on trade and investment (Hatton and Williamson, 2005).

To be sure, the claims made by both the emigration pessimists and the immigration pessimists are controversial. On brain drain, recent literature counters earlier arguments by suggesting that opportunities for emigration may increase the incentive to acquire human capital by enough to create a brain gain (Stark, Helmenstein, and Prskawetz, 1997; Stark and Wang, 2002). In receiving countries, especially the United States, some economists see the consequences of immigration for native workers as benign or even positive (Card, 2005; Cortes, 2005; Ottaviano and Peri, 2006).

Another factor complicating international coordination on global labor flows is that control over international migration is largely in the hands of receiving countries. Labor flows between rich and poor nations tend to be unidirectional, from the latter to the former. In 2005, just 12 higher income nations were host to 51 percent of the global stock of international migrants (United Nations, 2006).

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3 These 12 were the United States, Russia, Germany, France, Canada, the United Kingdom, Spain, Australia, Hong Kong, China, Israel, Italy, and Japan.
The United States, alone, is home to 20 percent of the global migrant stock, but sends few migrants to developing countries. Because high-income countries are able to set global migration policy unilaterally, they have little incentive to address sending-country concerns.

The disconnect between sending and receiving-country perspectives on international migration raises important policy questions. Is emigration a viable strategy for developing countries to raise living standards? Are there environments where emigration may be particularly helpful or harmful? What facts do economists need to know in order to be sensible policy advice to sending and receiving countries?

In this chapter, I selectively review academic literature on the causes and consequences of emigration from developing countries. My aim is to identify facts about international migration that are relevant to those concerned about why labor moves between countries and how these movements affect sending-country economies. Empirical work on global labor flows is still in an early state. As is often the case, the literature provides incomplete answers to some of the most urgent questions. Nevertheless, recent work yields a number of robust results and is helpful for identifying where future research should be directed.

In section 2, I begin by describing current trends in international migration. Developing countries that are small, densely populated, and middle income tend to have the highest emigration rates. In section 3, I move on to discuss the relationship between skill and migration. In nearly all countries, the more skilled are those most likely to emigrate. The positive selection of emigrants is consistent with international differences in labor productivity—rather than international differences in inequality—being the primary determinant of which types of workers leave. Emigrants sort themselves across destination countries according to the reward to skill, in a manner consistent with income maximization. In section 4, I discuss the contribution of migrant networks to lowering migration costs, which for many countries appear to be substantial.

In section 5, I examine research on the impact of emigration on sending countries. In the few cases that have been studied, labor outflows appear to help raise sending-country wages, while having little impact on fiscal accounts. Though there has been recent progress in the literature, the question of whether opportunities for emigration produce brain drain versus brain gain remains unresolved. We still will do not know how opportunities for emigration affect the stock of human capital in sending countries. Recently, migrant remittances

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4 While there are labor flows between low- and middle-income countries, data constraints require me to focus on flows into high-income countries. There appear to be sizable flows from the former Soviet Republics to Russia; Bangladesh to India; Egypt, India, Pakistan, and the Philippines to the Gulf States; Afghanistan to Iran; Iraq to Syria; other Southern African states to South Africa; Indonesia to Malaysia; Malaysia to Singapore; Guatemala to Mexico; and Nicaragua to Costa Rica (Ratha and Shaw, 2007).

5 Literature on impacts on receiving countries is much more developed. See Borjas (1999b, 2007).
have grown rapidly, helping households smooth consumption in response to income shocks. There is some evidence that labor outflows promote trade, technology diffusion, and political openness, though the econometric identification of these impacts is not problem free.

By way of conclusion, in section 6, I summarize what appear to be the more empirically robust findings (or nonfindings) in the literature.

2. Patterns of International Migration

International migration appears to be on the rise. Only recently have cross-country data on emigrant stocks have become available. As a result, research on international migration is still emerging. In this section, I discuss data sources on the stock of international migrants and then move on to examine emigration rates in sending countries, the distribution of migrants across receiving countries, the correlates of bilateral migration flows, and the emigration of skilled labor.

2.1 Data and Recent Trends

There have been several recent attempts to measure international migration. The OECD (2006) lists the foreign-born population 15 years and older in 2000 by source country and education level (primary—0 to 8 years, secondary—9 to 12 years, tertiary—13 plus years, unknown) for each OECD country. Docquier and Marfouk (2006) extend the OECD data by constructing more complete estimates of the stocks of international migrants. They use the population censuses for 30 OECD countries in 1990 and 2000 to obtain the count of adult immigrants (25 years and older) by source country and level of education (also, primary, secondary, or tertiary schooling). They combine these counts with the size of adult populations and the fraction of adult populations with different levels of schooling from Barro and Lee (2000) to obtain emigration rates by education level and source country, yielding 174 source countries in 1990 and 192 in 2000. While the set of source countries is comprehensive, the coverage of destination countries excludes those counties not in the OECD as of 2000.

Low-income countries are an increasingly important source of migrants to high-income countries. Table 1 shows the share of the immigrant population in OECD countries by sending-country region. In 2000, 67 percent of immigrants in the OECD were from a developing country, up from 54 percent in 1990. This gain came almost entirely at the expense of Western Europe, whose share of OECD immigrants fell from 36 percent to 24 percent.

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6 Tables and figures are based on calculations using raw data from Docquier and Marfouk (2006).
Table 1: Share of OECD Immigrants by Sending Region, 2000

<table>
<thead>
<tr>
<th>Low-Income Sending Region</th>
<th>Share of Immigrants by OECD Receiving Region</th>
<th>Change in OECD Share, 1990 to 2000</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All OECD</td>
<td>North America</td>
</tr>
<tr>
<td>Mexico, Central America, Caribbean</td>
<td>0.202</td>
<td>0.374</td>
</tr>
<tr>
<td>Southeast Asia</td>
<td>0.102</td>
<td>0.137</td>
</tr>
<tr>
<td>Eastern Europe</td>
<td>0.099</td>
<td>0.049</td>
</tr>
<tr>
<td>Middle East</td>
<td>0.063</td>
<td>0.032</td>
</tr>
<tr>
<td>South Asia</td>
<td>0.052</td>
<td>0.052</td>
</tr>
<tr>
<td>North Africa</td>
<td>0.044</td>
<td>0.009</td>
</tr>
<tr>
<td>South America</td>
<td>0.041</td>
<td>0.050</td>
</tr>
<tr>
<td>Central, South Africa</td>
<td>0.036</td>
<td>0.021</td>
</tr>
<tr>
<td>Former Soviet Union</td>
<td>0.029</td>
<td>0.023</td>
</tr>
<tr>
<td>Pacific Islands</td>
<td>0.004</td>
<td>0.003</td>
</tr>
<tr>
<td>Total</td>
<td>0.672</td>
<td>0.750</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>High-Income Sending Region</th>
<th>Share of Immigrants by OECD Receiving Region</th>
<th>Change in OECD Share, 1990 to 2000</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All OECD</td>
<td>North America</td>
</tr>
<tr>
<td>Western Europe</td>
<td>0.244</td>
<td>0.152</td>
</tr>
<tr>
<td>Asia, Oceania</td>
<td>0.055</td>
<td>0.062</td>
</tr>
<tr>
<td>North America</td>
<td>0.029</td>
<td>0.037</td>
</tr>
<tr>
<td>Total</td>
<td>0.328</td>
<td>0.251</td>
</tr>
</tbody>
</table>

Notes: This table shows data for 2000 on the share of different sending regions in the adult immigrant population of the entire OECD and of three OECD subregions. High-Income North America includes Canada and the United States and High-Income Asia and Oceania includes Australia; Hong Kong, China; Japan; the Republic of Korea; New Zealand; Singapore; and Taiwan, China.

Among developing sending regions, Mexico, Central America, and the Caribbean is the most important, accounting for 20 percent of OECD immigrants in 2000, up from 15 percent in 1990. Half of this region’s migrants come from Mexico, which in 2000 was the source of 11 percent of OECD immigrants, making it by far and away the world’s largest supplier of international migrants. The next most important developing source countries for OECD immigrants are Turkey (3.5 percent of OECD immigrants); China, India, and the Philippines (each with 3 percent); Vietnam, the Republic of Korea, Poland, Morocco, and Cuba (each with 2 percent); and Ukraine, Serbia, Jamaica, and El Salvador (each with 1 percent).

There is a tendency for different destination regions to draw more heavily on migrants from particular source countries. Mexico, Central America, and the Caribbean comprise the largest source region for North America, but send few migrants to other parts of the world; Eastern Europe is the most important

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7 As recently as 1990, the United Kingdom was the largest source country for immigrants in the OECD.
developing source region for OECD Europe; and Southeast Asia is the most important developing source region for Australia and Oceania. Unsurprisingly, geographic distance plays an important role in migration.

The growing importance of lower-income countries in the supply of international migrants has contributed to an overall increase in labor flows into rich countries. Table 2 shows the share of the population that is foreign born in select OECD members. The size of the immigrant population varies across destinations, reflecting differences in both their attractiveness and openness to international migrants.

Table 2: Share of Foreign-Born Population in Total Population

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>23.0</td>
<td>23.0</td>
<td>23.2</td>
<td>23.6</td>
<td>0.6</td>
</tr>
<tr>
<td>Austria</td>
<td>10.5</td>
<td>10.8</td>
<td>13.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Belgium</td>
<td>9.7</td>
<td>10.3</td>
<td>11.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Canada</td>
<td>16.6</td>
<td>17.4</td>
<td>17.7</td>
<td>18.0</td>
<td>1.4</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>4.2</td>
<td>4.6</td>
<td>4.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Denmark</td>
<td>4.8</td>
<td>5.8</td>
<td>6.2</td>
<td>6.3</td>
<td>1.6</td>
</tr>
<tr>
<td>Finland</td>
<td>2.0</td>
<td>2.6</td>
<td>2.8</td>
<td>3.2</td>
<td>1.2</td>
</tr>
<tr>
<td>France (a)</td>
<td></td>
<td>10.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Germany (b)</td>
<td>11.5</td>
<td>12.5</td>
<td>12.8</td>
<td>12.9</td>
<td>1.4</td>
</tr>
<tr>
<td>Greece (c)</td>
<td></td>
<td>10.3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hungary</td>
<td>2.8</td>
<td>2.9</td>
<td>3.0</td>
<td>3.2</td>
<td>0.4</td>
</tr>
<tr>
<td>Ireland (d)</td>
<td>6.9</td>
<td>8.7</td>
<td>10.0</td>
<td>11.0</td>
<td>4.0</td>
</tr>
<tr>
<td>Italy (c)</td>
<td></td>
<td>2.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Luxembourg</td>
<td>30.9</td>
<td>33.2</td>
<td>32.9</td>
<td>33.1</td>
<td>2.2</td>
</tr>
<tr>
<td>Mexico</td>
<td>0.4</td>
<td>0.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Netherlands</td>
<td>9.1</td>
<td>10.1</td>
<td>10.6</td>
<td>10.6</td>
<td>1.6</td>
</tr>
<tr>
<td>New Zealand (d)</td>
<td>16.2</td>
<td>17.2</td>
<td>18.4</td>
<td>18.8</td>
<td>2.6</td>
</tr>
<tr>
<td>Norway</td>
<td>5.5</td>
<td>6.8</td>
<td>7.3</td>
<td>7.8</td>
<td>2.3</td>
</tr>
<tr>
<td>Poland</td>
<td></td>
<td>1.6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Portugal</td>
<td>5.4</td>
<td>5.1</td>
<td>6.7</td>
<td>6.7</td>
<td>1.3</td>
</tr>
<tr>
<td>Slovak Republic (c)</td>
<td></td>
<td>2.5</td>
<td></td>
<td>3.9</td>
<td></td>
</tr>
<tr>
<td>Spain (c)</td>
<td></td>
<td>5.3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sweden</td>
<td>10.5</td>
<td>11.3</td>
<td>11.8</td>
<td>12.2</td>
<td>1.7</td>
</tr>
<tr>
<td>Switzerland</td>
<td>21.4</td>
<td>21.9</td>
<td>22.8</td>
<td>23.5</td>
<td>2.2</td>
</tr>
<tr>
<td>Turkey</td>
<td></td>
<td>1.9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>United Kingdom</td>
<td>6.9</td>
<td>7.9</td>
<td>8.6</td>
<td>9.3</td>
<td>2.3</td>
</tr>
<tr>
<td>United States</td>
<td>9.3</td>
<td>11.0</td>
<td>12.3</td>
<td>12.8</td>
<td>3.5</td>
</tr>
</tbody>
</table>

Source: OECD, 2006.

Notes: (a) 2000 value is from 1999; (b) 2004 value is from 2003; (c) 2000 value is from 2001; (d) 1995 value is from 1996.
Aside from Luxembourg, the countries with the largest immigrant presence in 2004 are Australia (24 percent), Switzerland (24 percent), New Zealand (19 percent), and Canada (18 percent). Next in line are the large economies of Germany (13 percent), the United States (13 percent), France (10 percent), and the United Kingdom (10 percent), with the United States hosting 40 percent of immigrants living in OECD countries.

There is strong evidence that a rising share of labor inflows in rich countries are made up by illegal entrants, with data for the United States being the most extensive. Passel (2006) estimates that in 2005 illegal immigrants accounted for 35 percent of the U.S. foreign-born population, up from 28 percent in 2000 and 19 percent in 1996. Of the 2005 population of illegal immigrants, 56 percent were from Mexico, implying that 60 percent of the population of Mexican immigrants in the United States was unauthorized (Hanson, 2006).

There is substantial variation across countries in the propensity to emigrate. As of 2000, there were 22 developing nations with 10 percent or more of their adult population having migrated to the OECD, and 16 developing countries with emigration rates above 5 percent. At the other extreme, 52 developing countries had emigration rates below 1 percent. While emigration is rising over time, there is strong persistence in which countries send more people abroad, as seen in Figure 1, which plots emigration rates in 1990 and against those in 2000. The countries with the largest increase in emigration rates over 1990 to 2000 include neighbors of the United States (the Caribbean, Central America, Mexico) and former east bloc countries (Albania, Bulgaria). The countries experiencing the largest decrease in emigration rates were Ireland, Lebanon, Panama, and Greece. Interestingly, war-torn countries do not show up as having particularly high emigration rates to the OECD overall or large increases in emigration rates over the 1990s.

Income is an obvious driver of emigration. In Figure 2, it appears the relation between emigration rates and income is non-monotonic. There is a level of per capita GDP of around $3,000 (in 2000 PPP-adjusted terms) below which emigration rates are very low. Above this threshold, emigration is strongly decreasing in average income. This non-monotonicity is consistent with recent literature on the relation between international migration and income (Clark, Hatton, and Williamson, 2007), which reinforces the idea that credit constraints impede emigration from very poor counties.
2.2 Brain Drain

Much of the literature on international migration focuses on the movement of skilled labor, whose departure may drain poor economies of scarce supplies of human capital. Figure 3 shows the emigration rate for adults with a tertiary education against the emigration rate for all adults. In 2000, there were 41 developing countries with emigration rates for the tertiary educated above 20 percent.

Brain drain is a concern where there are distortions in the decision to acquire human capital. Absent distortions, moving labor from a low-productivity to a high-productivity economy unambiguously raises global income (Benhabib and Jovanovic, 2007). However, if there are positive externalities associated with learning (e.g., Lucas, 1988), then the social product of human capital exceeds its private product and the exodus of skilled labor from a country may have adverse consequences for its economic development (Bhagwati and Hamada, 1974). Another negative impact of brain drain is that many individuals have their education subsidized by the state, meaning their emigration would deprive their origin country of tax contributions to offset the cost of their schooling (McHale, 2007).

Figure 3: Emigration Rates for the More Educated, 2000
Recent literature explores the possibility that the opportunity for emigration may actually increase the supply of human capital in a country, creating a brain gain (Stark and Wang, 2002). With high incomes for skilled labor in rich countries and uncertainty over who will succeed in emigrating, the option of moving abroad induces individuals to accumulate enough additional human capital to compensate for the loss in skill to labor outflows. For this argument to go through, the probability of emigrating must be large enough to affect the expected return to investing in skill. It must also be true that many people believe they have a non-trivial chance of moving abroad. If, for most people, the expected probability of emigrating is small, the brain-gain logic collapses. One environment where this might occur is countries in which the distribution of wealth is highly unequal, such that few individuals can afford the up front costs of either acquiring human capital (which may involve both direct costs for schooling and indirect costs in terms of time out of the labor force) or moving abroad (which may involve direct costs to acquire a visa and indirect time costs).

Only a handful of empirical papers examine the relationship between emigration and human-capital accumulation. For a cross-section of countries, Beine, Docquier, and Rapoport (2006b) report a positive correlation between emigration to rich countries (measured by the fraction of the tertiary educated population living in OECD countries in 1990) and the increase in the stock of human capital (measured as the 1990 to 2000 change in the fraction of adults who have tertiary education). While this finding is consistent with emigration increasing the incentive to acquire education, the cross-section correlation between emigration and schooling is not well suited for causal inference about the impact of brain drain on educational attainment. Education and migration decisions are likely to be jointly determined, making each endogenous to the other. Valid instruments for migration are very difficult to find. Despite four decades of research, we still do not know how the opportunity to emigrate affects the supply of human capital in sending countries, leaving the debate about brain drain unresolved.

Finally, it is worth considering how emigration rates for the highly educated have changed in recent decades. Figure 4 plots emigration rates for the tertiary educated across countries in 1990 and 2000.

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8 See Docquier and Rapoport (2007) for a survey of the theoretical literature on brain drain.
Figure 4: Persistence in the Emigration of the Highly Educated

The countries with the largest increase in emigration rates for the highly educated are primarily countries that have experienced civil conflict, such as Afghanistan, Angola, the Democratic Republic of Congo, Haiti, Mozambique, Rwanda, Sierra Leone, and Somalia. Thus, while civil conflict does not provoke a general flight to OECD countries (see Figure 1), it does appear to provoke the flight of the more skilled. It has long been recognized that the induced emigration of skilled labor may be an important cost of civil war. Figure 4 is consistent with this perception, though careful research quantifying these costs is difficult to find in the literature.

3. Selection into Migration

Who migrates from poor to rich countries is the subject of a growing empirical literature. The high propensity of the highly educated to migrate abroad is seen clearly in Figure 5, which plots the share of emigrants with tertiary education against the share of the general population with tertiary education in 2000. Nearly all points lie above the 45-degree line, indicating that in the large majority of countries emigrants are positively selected in terms of schooling. That is, with the exception of a few countries (e.g., Canada, Turkey, the United States), the more highly educated are over-represented among emigrants relative to their presence in the population as a whole.
Interestingly, positive selection of emigrants is at odds with much recent empirical literature on international migration. In an influential line of work, Borjas (1987, 1991) uses the Roy (1951) model to show how migration costs and international variation in the premium for skill affect the incentive to migrate. In countries with low average wages and high wage inequality, as appears to be the case in much of the developing world, there is negative selection of emigrants. Those with the greatest incentive to relocate to rich countries (which tend to have high average wages and low wage inequality) are individuals with below-average skill levels in their home countries.

Much of the recent empirical research on Borjas’ negative-selection hypothesis examines labor movements either from Mexico to the United States or Puerto Rico to the U.S. mainland. Puerto Rican outmigrants tend to have low education levels relative to non-migrants (Ramos, 1992; Borjas, 2006), consistent with migrants being negatively selected in terms of skill. Mexican emigrants, however, appear to be drawn more from the middle of the country’s schooling distribution, consistent instead with intermediate selection. Feliciano (2001), Chiquiar and Hanson (2005), Orrenius and Zavodny (2005), McKenzie and Rapoport (2006), and Cuecuecha (2005) find that emigrants from Mexico are drawn from the middle of the wage or schooling distribution, while Ibarraran
and Lubotsky (2005) and Fernandez-Huertas (2006) find that Mexican emigrants are drawn from the lower middle of the wage or schooling distribution.

Based on Figure 5, Mexico and Puerto Rico (and Turkey) would appear to be exceptional cases. Positive selection of emigrants is a nearly universal phenomenon. Despite strong evidence that emigrants are positively selected in terms of schooling, there is confusion in the literature over the relationship between income inequality and the incentive to emigrate. An empirical approach made popular by Borjas (1987) is to explain bilateral migration using sending-country per capita GDP and income inequality (e.g., as measured by the GINI coefficient) relative to the receiving country (e.g., Clark et al., 2007; Mayda, 2005). A positive parameter estimate on the GINI coefficient is seen as an indicator that migrants are negatively selected in terms of skill. However, this approach characterizes selection into migration only under restrictive conditions.

To characterize the relationship between income inequality and migration, it is useful to develop a simple model of the migration decision. Let the wage for individual $i$ from sending country $s$ in receiving country $r$ be

$$ W_{isr} = \exp(\mu_r + \delta_r, z_i), \quad (1) $$

where $\mu_r$ is the return to raw labor in $r$, $\delta_r$ is the return to an additional year of schooling level in $r$, and $z_i$ is an individual $i$'s years of schooling. Let the cost of migrating from country $s$ to country $r$ be given by,

$$ C_{isr} = f_{sr} + \varepsilon_{isr}, \quad (2) $$

where $f_{sr}$ is a fixed monetary cost common to all individuals that migrate from $s$ to $r$ and $\varepsilon_{isr}$ is an idiosyncratic migration cost term that has mean zero and an extreme value distribution. Finally, let the utility associated with migrating from country $s$ to country $r$ be a linear function of wages and migration costs, such that

$$ U_{isr} = W_{isr} - C_{isr}. \quad (3) $$

where utility from not migrating equals the sending-country wage. If individuals make the migration decision in order to maximize utility, then, given the error is extreme value, the model is a logit. Consider the log odds of an individual with a college education migrating from $s$ to $r$, which, given the logit structure, can be written as,

$$ \ln \frac{E_{isr}^c}{E_{is}^c} = \left( W_r^c - W_s^c \right) - f_{sr}, \quad (4) $$

where $E_{isr}^c$ is the share of the college educated in $s$ that migrate to $r$, $E_{is}^c$ is the share of college educated that remain in $s$, and $W_h^c$ is the wage to college educated labor in country for $h = r, s$. Equation (6) expresses the logic of the Roy model, in which income maximization is the motivation for migration. More individuals will move from country $s$ to country $r$ the larger is the wage differential between the two countries and the smaller are fixed migration costs.
Grogger and Hanson (2007) show that this setup can be generalized to allow for migration costs specific to skill and correlation in idiosyncratic migration costs across receiving countries.

To use this model to evaluate migrant selection in terms of skill, I follow Grogger and Hanson (2007) and compare the log odds of emigrating for those with a college education (c) relative to those with a primary education (p), which from (4) is given by,

\[
\ln \frac{E^c_s}{E^p_s} - \ln \frac{E^p_r}{E^p_s} = \left( W^c_r - W^c_s \right) - \left( W^p_h - W^p_s \right),
\]

where fixed migration costs are differenced out of the expression. If the net gain to emigrating for the college educated exceeds that for the primary educated, the expression in (7) would be positive and emigrants from h would be positively selected in terms of education. Using (1), this would require that

\[
e^{\mu_r - \mu_s} > \frac{e^{\delta_z} - 1}{e^{\delta_z} - 1},
\]

where \( z \) indicates years of schooling for a college educated worker and the return to primary educated labor is normalized to equal \( \mu \). Under the convenient approximation that \( \exp(x) - 1 = x \) for small \( x \), we can rewrite equation (8) as,

\[
\frac{W^p_r}{W^p_s} > \frac{\delta_z}{\delta_r}.^9
\]

On the left of (9) is the ratio of wages paid to raw labor (proxied here by the wage for primary educated labor) in the receiving relative to sending country, which can be thought of as the ratio of raw labor productivity in the two countries; on the right of (9) is the ratio of the Mincerian return to schooling (the log wage gain from an additional year of schooling) in the sending relative to the receiving country.

Equation (9) says that emigrants from sending country s will be positively selected in terms of schooling as long as the gain in the productivity of raw labor from moving abroad more than compensates educated workers for the loss in the return to schooling.\(^10\) One can think of the ratio of the return to schooling on the right of (9) as capturing wage inequality, since, all else equal, higher returns to schooling in country s will imply greater wage inequality. Apparent in (9) is that higher wage inequality in a country by no means guarantees more negative selection of emigrants. Other factors come into play, namely labor productivity. Differences in labor productivity matter for selection because more skilled workers have more productivity equivalent units of labor to supply than unskilled workers. All else equal, higher labor productivity increases the

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\(^9\) See Grogger and Hanson (2007) for more details on this derivation.

\(^10\) A similar implication is present in Rosenzweig (2007), who derives a Roy model of migration with moving costs that include components that are fixed in monetary units and time-equivalent units.
incentive to emigrate more for the more skilled. One way to explain positive selection of emigrants in Figure 5 is that international differences in labor productivity are large relative to international differences in the Mincerian return to schooling.

To interpret the condition in (9), note that when comparing poor sending countries to rich receiving countries, it is usually the case that the raw wage is higher in the receiver while the return to schooling is higher in the sender. Suppose that in Nigeria someone with a primary education would earn $1,000 a year and someone with a college education would earn $5,000 a year, while the comparable sums in the United States are $20,000 and $40,000. Clearly, the implied return to schooling in Nigeria (log return to schooling of 0.16) is higher than in the United States (log return to schooling of 0.07). Yet, the higher productivity of raw labor in the United States (U.S./Nigerian raw wage ratio is 20) more than compensates, making the net gain from emigrating from Nigeria greater for more educated workers. Thus, when there are large differences in raw labor productivity between countries, emigrants will tend to be positively selected in terms of skill.

Negative selection of workers by skill will obtain either where differences in labor productivity across countries are small or migration costs are increasing in skill. The latter feature is adopted by Borjas (1987), who assumes that migration costs are fixed in units of time (such that more skilled workers pay more to migrate). As a result, in his model (at least in its most simplified form—see Borjas (1991) for more elaborate models with negative and positive selection) the pattern of migrant selection is determined entirely by the relative return to skill across countries. However, once one introduces large productivity differences between countries or migration costs that are fixed in monetary units, the pattern of selection is indeterminate. Selection may be positive or negative, depending on relative labor productivity, relative returns to skill, and skill-specific migration costs. Even in the simple model of migration I develop here, migration selection in terms of skill is not robust. While this may seem obvious once one inspects the theory, it is perhaps a result that is underappreciated in the literature.

Credit constraints in sending countries could make migration costs decreasing in skill, which would strengthen pressure for positive selection. Suppose, for instance, that education and migration are subject to a fixed monetary cost and credit-market imperfections make wealthier individuals subject to lower borrowing costs (e.g., Banerjee and Foster, 1993; Rapoport, 2002). Then, the wealthier will be more likely to become educated and more likely to migrate abroad (Assuncao and Carvalho, 2007). For Mexico, McKenzie and Rapoport (2007) find an inverted U-shaped relationship between migration and wealth, consistent with low-wealth individuals being too poor to afford migration and high-wealth individuals having an incentive not to leave.
Rosenzweig (2007) examines migrant selectivity with data from the New Immigrant Survey (NIS). The NIS reports the wage an individual earned in his last job before coming to the United States, which Rosenzweig uses to estimate the marginal product of labor by source country. A country’s overall emigration rate to the United States is decreasing in the marginal product of labor, suggesting countries with higher labor productivity send fewer migrants to the United States. Rosenzweig estimates that raising a country’s marginal product of labor by 10 percent relative to the United States would reduce the number of emigrants obtaining U.S. employment-based visas by 8 percent. The average schooling of emigrants to the United States is increasing in the marginal product of labor, indicating that in countries with higher labor productivity it is the more educated migrants who are most likely to leave.\footnote{In related work, Rosenzweig (2006) finds that the numbers of students who come to the United States for higher education and who stay in the United States after completing their education are each decreasing in the marginal product of labor in the source country, suggesting that low rewards to skill in a country induce students seeking university training to pursue their schooling abroad.}

Any analysis of migrant selection based on observed characteristics leaves open the question of how migrants are selected on unobservables. McKenzie, Gibson, and Stillman (2006) examine this issue using data on Tonga, in which individuals may apply to a lottery to obtain a visa to move to New Zealand. Comparing visa applicants who lost the lottery (meaning they stayed in Tonga) with non-applicants, they find that those desiring to migrate have higher earnings, controlling for observed characteristics, suggesting prospective migrants from Tonga are positively selected in terms of unobserved skill. McKenzie, Gibson, and Stillman find that failing to account for selection on unobservables leads to substantial overstatement of the gains to migration.

What does the simple model of income maximization in (7) imply about how emigrants sort themselves across destination countries? Rewrite the expression as,

\[(10) \quad \ln \frac{E^c_{sr}}{E^c_s} - \ln \frac{E^p_{sr}}{E^p_s} = \left( W^c_r - W^p_r \right) + \alpha_s + \eta_{sr} \]

where $\alpha_s$ is a country fixed effect that absorbs sending country wages and $\eta_{sr}$ is a disturbance term capturing measurement error in migration flows. Equation (10) is a regression specification that predicts that more skilled workers will flow in greater numbers to receiving countries that have larger rewards to skill, expressed here by the level difference in wages between high- and low-educated labor. Grogger and Hanson (2007) develop a fixed-effects specification similar to (10) and, using data from Beine, Docquier, and Rapoport (2006a), find that the bilateral flow of more-educated migrants (relative to less-educated migrants) is increasing in the destination-country earnings gap between high-income and low-income workers.
Table 3: Share of OECD Immigrants by Receiving Region and Education, 2000

<table>
<thead>
<tr>
<th>Destination Region</th>
<th>All</th>
<th>Primary</th>
<th>Secondary</th>
<th>Tertiary</th>
</tr>
</thead>
<tbody>
<tr>
<td>North America</td>
<td>0.514</td>
<td>0.352</td>
<td>0.540</td>
<td>0.655</td>
</tr>
<tr>
<td>Europe</td>
<td>0.384</td>
<td>0.560</td>
<td>0.349</td>
<td>0.236</td>
</tr>
<tr>
<td>Australia &amp; Oceania</td>
<td>0.102</td>
<td>0.088</td>
<td>0.111</td>
<td>0.109</td>
</tr>
<tr>
<td>All OECD</td>
<td>0.355</td>
<td>0.292</td>
<td>0.353</td>
<td></td>
</tr>
</tbody>
</table>

Source: Grogger and Hanson (2007).
Notes: This table shows the share of OECD immigrants by receiving region and education group in 2000.

Their results can account for the observed pattern of emigrant sorting across destinations, seen in Table 3. The United States is by far and away the largest destination country for international migrants, with Canada being the second largest. In 2000, 53 percent of the foreign-born population in OECD countries resided in North America, while 36 percent resided in the European Union and 10 percent resided in Asia and Oceania. The draw of the United States and Canada is strongest for the more educated. While North American attracts only 38 percent of emigrants with primary education it attracts 66 percent of emigrants with tertiary education. In Europe, the shares are flipped, as it attracts 22 percent of emigrants with tertiary schooling and 53 percent of emigrants with primary schooling.

The pattern of emigrant sorting in Table 3 is consistent with observed differences in the reward to skill. Among OECD destinations, the level difference in income between high-skill and low-skill labor is largest in the United States, with Canada having the fourth-largest difference (and the United Kingdom and Australia coming in at numbers two and three). Continental Europe, on the other hand, has a relatively low income gap between high- and low-skill labor, consistent with relatively low income inequality. The consequence of these income differences appears to be that North America and Australia attract a more-skilled mix of immigrants, while Continental Europe attracts a less-skilled mix.

4. Networks and Migration Costs

Although the evidence in Table 2 points to growth in international migration, the global stock of emigrants remains small, at around 3 percent of the world population. This is surprising, given that the gains to international migration appear to be huge. Hanson (2006) reports that in 2000 the average hourly wage for a male with nine years of education was $2.40 in Mexico and $8.70 for recent Mexican immigrants in the United States (in PPP-adjusted prices). At the average
labor supply for U.S. adult male workers of 35 hours per week, this would amount to an annual income gain of $12,000.

One way to reconcile large and persistent cross-country income differences with small global labor movements is that receiving countries are successful in restricting labor inflows. While long queues for immigration visas in receiving countries indicate legal admission restrictions bind, rising levels of illegal immigration suggest that borders are porous. Further, observed costs of illegal entry are small in comparison to estimated income gains. In a sample of high migration-communities in Mexico during 2002 to 2004, Cornelius (2005) finds the average price paid by migrants to be smuggled across the U.S. border was $1,700, or one-seventh the apparent income gain.

Another explanation for small global labor flows is the existence of large unobserved migration costs associated with credit constraints in financing migration, uncertainty over economic opportunities abroad, the psychic cost of leaving home, or other factors. There is considerable academic interest in the role of migration networks in lowering such costs. Survey evidence suggests transnational migration networks provide prospective migrants with information about economic conditions in destination countries, support in managing the immigration process, and help in obtaining housing and finding a job (Massey et al., 1994; Massey and Espinosa, 1997). Much of the research on migration networks focuses on Mexico. On the process of crossing the border, Orrenius and Zavodny (2005) report that among young males in Mexico the probability of migrating to the United States is higher for individuals whose fathers or siblings have emigrated. Gathmann (2004) documents that migrants with family members in the United States are less likely to hire the services of a professional smuggler, and, among those that do, likely to pay lower prices. And McKenzie and Rapoport (2005) find that average schooling is lower among migrants from communities in Mexico with a stronger U.S. presence. These results are each consistent with networks lowering migration costs.

While we still know little about the magnitude of migration costs, research on networks suggests that migrant flows are sensitive to changes in these costs. Other evidence on the sensitivity of migration to migration costs comes from illegal crossings at the Mexico-U.S. border. For illegal migration, the intensity of border enforcement is an important determinant of entry costs, which take the form of fees paid to smugglers. Cornelius (2005) reports that smuggler prices to enter the United States illegally increased by 37 percent between 1996–98 and 2002–04, which spans the period during which the United States stepped up border enforcement efforts in response to the terrorist attacks of 9/11.

Gathmann (2004) examines the consequences of expanded border enforcement for migration. She identifies the correlates of smuggler prices paid by migrants from Mexico to the United States and estimates the impact of smuggler prices on migrant demand for smuggler services. The price a migrant pays to a smuggler is higher in years when border enforcement is higher, but the
elasticity of smuggler prices with respect to enforcement is small, in the range of 0.2 to 0.5. During the sample period, a one-standard-deviation increase in enforcement would have lead to an increase in smuggler prices of less than $40. The demand for smuggler services and the probability of choosing to migrate to the United States are both responsive to changes in coyote prices. However, given the small enforcement elasticity of coyote prices, the increase in U.S. border enforcement over 1986 to 1998 (during which real spending on border enforcement increased by four times) would have reduced the average migration probability in Mexico by only 10 percent.

In many destination countries, migrants reinforce networks by forming home-town associations that help members of their home communities make the transition to living in a new location. By creating links between the destination country and a specific community in the source country, these associations may lower migration costs for individuals linked by kinship or birthplace to migrants living abroad. Of 218 home-town associations formed by Mexican immigrants enumerated in a 2002 survey in California, 87 percent were associated with one of the nine central and western states in Mexico that have dominated migration to the United States since the early 20th century (Cano, 2004), indicating that migrant networks in Mexico are organized along regional lines.

Regional variation in migration networks creates regional variation in migration dynamics. McKenzie and Rapoport (2007) show that in Mexican communities with historically weak migration networks moderately more wealthy individuals are more likely to migrate, though very high-wealth individuals are not. Migrants are thus drawn from the middle of the wealth distribution, meaning that migration increases inequality. In communities with strong migration networks, however, lower-wealth individuals can afford to migrate, such that in these locations migration lowers inequality.

5. Impact of Emigration on Sending Countries

Emigration changes a country’s supply of labor, skill mix, and exposure to the global economy. These effects may have important consequences for a sending country’s aggregate output, structure of wages, fiscal accounts, and trade and investment flows, among other outcomes. In this section, I discuss recent empirical research on the impact of emigration on developing economies.

5.1 Labor Markets and Fiscal Accounts

Most research on the labor-market impacts of emigration focuses on Mexico. Mishra (2007), applying the regression framework in Borjas (2003), examines the correlation between emigration to the United States and decadal changes in wages for cohorts in Mexico defined by their years of schooling and labor-market experience. She estimates that over the period 1970–2000 the elasticity of wages
with respect to emigration in Mexico is 0.4, implying a 10 percent reduction in labor supply due to emigration would raise wages by 4 percent. Using a similar approach, Aydemir and Borjas (2007) estimate a wage elasticity for emigration in Mexico of 0.6. Wage elasticities of this magnitude suggest emigration has had a substantial impact on Mexico’s wage structure. Based on her estimation results and that fact that between 1970 and 2000 13 percent of Mexico’s labor force emigrated to the United States, Mishra (2007) calculates that emigration has raised average wages in the country by 8 percent. Upward wage pressure has been strongest for young adults with above-average education levels (those with 9 to 15 years of schooling), who in the 1990s were those most likely to emigrate (Chiquiar and Hanson, 2005).

In response to changes in labor supply associated with emigration, one might expect the supply of capital in Mexico to adjust, with the country becoming less attractive to inward foreign direct investment. Alternatively, higher wages could erode Mexico’s comparative advantage in labor-intensive industries, reducing the net exports of labor services embodied in goods as a consequence of emigration-induced Dutch disease. Either change would tend to offset the effects of emigration on wages in the country. Since the estimation approaches in Mishra (2007) and Aydemir and Borjas (2007) are reduced form, they capture the wage impact of emigration, net of these and other adjustments. Their results suggest that any response of capital accumulation or trade to emigration is too slow or too small to undo the wage consequences of labor outflows, at least over ten-year time intervals. Such a finding is not all that surprising. Factor-price differences between the United States and Mexico create an incentive for trade in goods, north-to-south flows of capital, and south-to-north flows of labor. Despite dramatic reductions in barriers to trade and investment between the two countries during the last two decades, U.S.-Mexico wage differences remain large. Since trade and investment are insufficient to equalize factor prices within North America, theory would predict that migration from Mexico to the United States would affect wages in both countries, consistent with the evidence.

The Mexican emigration experience differs from other countries in terms of the absence of positive selection, the high fraction of those leaving who enter the destination country as illegal migrants, and the sheer scale of the exodus. The positive selection of emigrants in most source countries raises the prospect of important fiscal impacts from international migration. In countries with progressive income taxes, the loss of skilled emigrants could adversely affect public budgets through a loss of future tax contributions. These lost contributions are in part the returns to public investments in the education of emigrating workers, which, after emigration, accrue to destination countries.

While there is a large body of theoretical literature on the taxation of skilled emigration (e.g., Bhagwati and Hamada, 1974; Bhagwati and Wilson, 1989; Docquier and Rapoport, 2007), empirical research on the subject is sparse. One
recent contribution is Desai, Kapur, and McHale (2003), who examine the fiscal effects of brain drain from India. In 2000, individuals with tertiary education made up 61 percent of Indian emigrants but just 5 percent of India’s total population. Between 1990 and 2000, the emigration rate for the tertiary educated rose from 2.8 percent to 4.3 percent, compared to an increase of just 0.3 percent to 0.4 percent for the population as a whole. Desai et al. examine Indian emigration to the United States, which in 2000 was host to 65 percent of India’s skilled emigrants (and 49 percent of all Indian emigrants). They begin by producing a counterfactual income series that gives emigrants the income they would have earned in India based on their observed characteristics and the returns to these characteristics in India (using a Mincer wage regression). On the tax side, they calculate income tax losses by running the counterfactual income series through the Indian income tax schedule and indirect tax losses using estimates of indirect tax payments per unit of gross national income. On the spending side, they calculate expenditure savings by identifying categories for which savings would exist—which are most categories except interest payments and national defense—and then estimating savings per individual. The results suggest Indian emigration to the United States cost India net tax contributions of 0.24 percent of GDP in 2000, which are partially offset by the tax take on remittances (coming off of the sales tax revenue generated by the extra spending remittances make possible) of 0.1 percent of GDP. For India, it appears that the tax consequences of skilled emigration are modest. For small countries with very high emigration rates, the tax consequences would obviously be larger.

The research discussed so far addresses the static consequences of emigration for an economy, ignoring dynamic considerations that may arise if skilled emigration raises the incentive of unskilled workers to acquire human capital. In theory, feedback effects from emigration to human-capital accumulation may change a country’s rate of economic growth. Mountford (1997) shows that in the presence of human-capital externalities an emigration-induced increase in the incentive to acquire skill can help an economy escape a poverty trap, characterized by low investment in education and low growth, and move to an equilibrium with high investment and high growth. Yet, it is entirely possible for feedback effects to work in the opposite direction. Miyagiwa (1991) develops a model in which, because of human capital spillovers, the migration of skilled labor from a low-wage, skill-scarce economy to a high-wage, skill-abundant economy reinforces the incentive for brain drain, depleting the low-wage country of skilled labor. In Wong and Yip (1999), the negative effects of brain drain on the stock of human capital reduce the labor-exporting country’s growth rate.

Given that plausible theoretical models offer very different predictions for the long-run consequences of skilled emigration, the effect of brain drain on an economy is ultimately an empirical question. As mentioned in section 2, the literature on how emigration affects the incentive to acquire skills has yet to
produce conclusive results, making it impossible to say whether the consequences of brain drain for growth are likely to be positive or negative. Case-study evidence is similarly inconclusive. In China, India, and Taiwan, China, the migration of skilled labor to Silicon Valley in the United States—where Indian and Chinese immigrants account for one third of the engineering labor force—has been followed by increased trade with and investment from the United States, helping foster the creation of local high-technology industries (Saxenian, 2002). The recent rise in educational attainment in China, India, and Taiwan, China may be partly a result of the lure of working in the United States and the domestic expansion of sectors intensive in the use of skilled technicians.\(^\text{12}\) In Africa, however, the exodus of skilled professionals, many of whom work in health care, may adversely affect living standards.

### 5.2 Remittances and Return Migration

In a static setting, were the only effect of international migration to move labor from one country to another, welfare in the sending country would decline (Hamilton and Whalley, 1984). While the average incomes of migrants and destination-country natives would rise, average income in the sending country would fall. Migrants, however, often remit a portion of their income to family members at home, possibly reversing the income loss in the sending country associated with the depletion of labor. In the last several years, there has been substantial academic and policy interest in the consequences of remittances for economic activity in sending countries.

Table 4 shows workers’ remittances received from abroad as a share of GDP by geographic region. Remittances have increased markedly in East Asia and the Pacific, Latin America and the Caribbean, South Asia, and Sub-Saharan Africa. As of 2004, remittances exceeded official development assistance in all regions except Sub-Saharan Africa and were greater than 65 percent of foreign direct investment inflows in all regions except Europe and Central Asia. Among the smaller countries of Central America, the Caribbean, and the South Pacific, remittances account for a large share of national income, ranging from 10 percent to 17 percent of GDP in the Dominican Republic, Guatemala, El Salvador, Honduras, Jamaica, and Nicaragua, and representing an astounding 53 percent of GDP in Haiti (Acosta, Fajnzylber, and Lopez, 2007).

\(^{12}\) Between 1990 and 2000, the share of the adult resident population (i.e., net of brain drain) with a tertiary education rose from 2.0 percent to 2.7 percent in China, 4.1 percent to 4.8 percent in India, and 12.2 percent to 19.1 percent in Taiwan, China.
Reported remittances reflect those captured by the balance of payments, which Freund and Spatafora (2007) suggest may understate actual remittances. Formal remittance channels include banks and money transfer operators (e.g., Western Union) for which service fees average 11 percent of the value of remittances. Informal remittances, which are moved by couriers, relatives, or migrants themselves, tend to have lower fees, but presumably higher risk. Formal remittances are negatively correlated with service charges, with a 10 percent increase in fees being associated with a 1.5 percent reduction in transfers. Fees are lower in economies that are dollarized and more developed financially (as measured by the ratio of bank deposits to GDP).

Theoretical literature on migration models remittances as the outcome of a dynamic contract between migrants and their families. A family helps finance migration costs for one of its members in return for a share of future income gains associated with having moved to a higher wage location. Remittances are the return on investments the family has made in the migrant. The prediction is that remittances would rise following an increase in emigration and decline as existing emigrants age and pay off debts to their families.

Having migrants abroad may also provide insurance for a family. To the extent income shocks are imperfectly correlated across countries, migration helps families smooth consumption over time by keeping remittances high when sending-country income is low relative to the destination country and low when sending-country income is relatively high (Rosenzweig and Stark, 1989). Yang (2007) examines changes in remittances to households in the Philippines before and after the Asian financial crisis, which he uses as a natural experiment to examine the impact of remittances on household behavior. As of 1997, 6 percent of Philippine households had a member that had migrated abroad. Some had gone to countries in the Middle East, whose currencies appreciated sharply against the Philippine peso in 1997–98, while others had gone to countries in East Asia, whose currencies appreciated less sharply or even depreciated. Consistent with consumption smoothing, remittances increased more for households whose migrants resided in countries that experienced stronger currency appreciation against the peso. Since income shocks associated with movements in exchange

Table 4: Workers’ Remittances and Compensation of Employees, % of GDP

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>East Asia &amp; Pacific</td>
<td>0.56</td>
<td>0.71</td>
<td>1.00</td>
<td>1.47</td>
<td>1.48</td>
<td>1.50</td>
</tr>
<tr>
<td>Europe &amp; Central Asia</td>
<td>1.02</td>
<td>1.42</td>
<td>1.27</td>
<td>1.28</td>
<td>1.44</td>
<td></td>
</tr>
<tr>
<td>Latin America &amp; Caribbean</td>
<td>0.70</td>
<td>0.79</td>
<td>1.04</td>
<td>1.67</td>
<td>2.06</td>
<td>1.98</td>
</tr>
<tr>
<td>Middle East &amp; North Africa</td>
<td>8.31</td>
<td>3.69</td>
<td>3.07</td>
<td>3.76</td>
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<td>4.13</td>
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<td>South Asia</td>
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<td>Sub-Saharan Africa</td>
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<td>1.49</td>
<td>1.67</td>
<td>1.60</td>
<td>1.57</td>
</tr>
</tbody>
</table>

Source: World Development Indicators.
rates are largely transitory in nature, the response of remittances reveals the extent to which migrants share transitory income gains with family members at home. Yang finds that a 10 percent depreciation of the Philippine peso is associated with a 6 percent increase in remittances.

Contrary to Yang’s results, remittances appear to be unresponsive to changes in government transfers. In Mexico (Teruel and Davis, 2000) and Honduras and Nicaragua (Olinto, 2007) remittances are uncorrelated with changes in rural household receipts from conditional cash transfer programs, which were introduced into communities on a randomized basis, permitting the experimental analysis of their impact on household behavior. Were remittances a vehicle for consumption smoothing among rural households, one would expect them to decline for a sending-country household, following an exogenous increase in government income support.

There is some evidence that increases in remittances are associated with increased expenditure on education and health. Yang (2007) examines changes in household expenditure and labor supply in the Philippines before and after the Asian financial crisis. Households with migrants in countries experiencing stronger currency appreciation vis-à-vis the peso had larger increases in spending on child education, spending on durable goods (televisions and motor vehicles), children’s school attendance, and entrepreneurial investments. In these households, the labor supply of 10–17 year old children fell by more, particularly for boys. In Mexico, Woodruff and Zenteno (2007) also find a positive correlation between migration and sending-country business formation. For a sample of small-scale enterprises, capital investment and capital-output ratios are higher in firms where the owner was born in a state with higher rates of migration to the United States. Woodruff and Zenteno instrument for current state migration rates using proximity to the railroads along which Mexico’s initial migration networks became established (Durand, Massey, and Zenteno, 2001). Their results are consistent with two different mechanisms for business formation: remittances relax credit constraints on the creation of small enterprises, or return migrants—who may have accumulated valuable work experience in the United States—are more likely to launch new businesses upon returning to Mexico.

Remittances indicate migrants maintain contacts with family members at home. They may do so in part because they anticipate returning home in the future, in which case return migration may depend on their foreign earning opportunities. Yang (2006) finds that an exchange rate shock that raises the peso-value of foreign earnings reduces the likelihood a Philippine emigrant returns home, with 10 percent real appreciation being associated with a one-year return rate that is 1.4 percent lower.

One potential negative consequence of remittances is an increase in demand for non-traded goods and services, driving up their prices and contributing to real exchange rate appreciation. Concerns about Dutch disease would be particularly acute for small countries experiencing large labor outflows,
including many economies in Central America, the Caribbean, and the Pacific. Research into the consequences of emigration for real exchange rates is still in an early stage.

5.3 Information and the Flow of Ideas

The positive correlation between bilateral trade and migration has been interpreted as evidence of a “diaspora externality,” in which previous waves of migration create cross-national networks that facilitate exchange. Gould (1994) finds that bilateral trade involving the United States is larger with countries that have larger immigrant populations in the United States. Head, Reis, and Swenson (1998) find that a 10 percent increase in Canada’s immigrant population from a particular country is associated with a 1 percent increase in bilateral Canadian exports and a 3 percent increase in bilateral Canadian imports, with more recent immigration having a stronger correlation with trade. It is difficult to draw causal inferences from these results, since immigration may be correlated with unobserved factors that also affect trade, such as the trading partners’ cultural similarity or bilateral economic policies (e.g., preferential trade policies or investment treaties that raise the return to both migration and trade).

Pushing the analysis a step further, Rauch and Trindade (2002) focus specifically on networks associated with overseas Chinese populations. Successive waves of emigration from southeastern China have created communities of ethnic Chinese throughout Southeast Asia, as well as in South Asia and on the east cost of Africa. Rauch and Trindade find that bilateral trade is positively correlated with the interaction between the two countries’ Chinese populations (expressed as shares of the national population), similar to the findings in Gould and Head, Ries, and Swenson. More interestingly, the correlation between Chinese populations and trade is stronger for differentiated products than it is for homogenous goods. To the extent differentiated products are more subject to informational problems in exchange (Rauch, 1999), these are the goods one would expect to be most sensitive to the presence of business networks.

Still unclear is whether greater trade is the natural outcome of increased migration or a reflection of the types of individuals who select into migration. If more skilled and more able individuals are more likely to migrate abroad and more likely to exploit opportunities for commercial exchange, then the correlation between trade and migration may be a byproduct of migrant self-selection. Subsequent policies to liberalize immigration in destination countries would not necessarily increase trade with sending countries, unless they allowed for the admission of individuals with a propensity to engage in trade. Head, Ries, and Swenson (1998) find that immigrants admitted as refugees or on the basis of family ties with Canadian residents have a smaller effect on trade than immigrants admitted under a point system that values labor-market skills.
More controversial is the impact of emigration on political outcomes in sending countries. When individuals live and work in another country they are exposed to new political ideologies and alternative systems of government. This exposure may be most important for students who go abroad to obtain a university degree, as they are at an impressionable age and often travel on visas that require them to return to home after completing their studies. Spilimbergo (2006) suggests there is an association between a country’s democratic tendencies and the political systems of the countries under which its students did their university training. He finds a positive correlation between the democracy index in a sending country and the average democracy index in the countries in which a country’s emigrant students have studied. Unknown is whether the political system of a sending country influences the types of countries in which its students choose to study. Kim (1998), for instance, finds that the bilateral flow of foreign students is larger between countries that share a common religion.

6. Final Discussion

Over the last decade and a half, migration flows from low- and middle-income countries to high-income countries have been increasing. The phenomenon is just beginning to be understood, as cross-country data on international migration have only recently become available. Another factor hindering research is that migration is jointly determined with many other outcomes, complicating causal inference on the impact of migration on economic development. With these concerns in mind, I summarize what appear to be the more robust findings (or nonfindings) in the literature.

1. Bilateral migration flows are negatively affected by migration costs, as captured by geographic or linguistic distance between countries, the absence of migration networks, or the stringency of border enforcement against illegal entry. That migration is negatively correlated with migration costs is not surprising. What is surprising is that migration flows are so small in relation to observed migration costs, suggesting that unobserved costs—broadly defined—must be substantial.

2. Emigration rates are highest for developing countries at middle-income levels and with higher population densities. The inverse U relationship between average income and migration is suggestive of credit constraints that prevent individuals with very low incomes from being able to finance migration through borrowing.

3. In most developing countries, it is the more educated who have the highest likelihood of emigrating. In the large majority of sending countries, emigrants are positively selected in terms of observable skill. In theory, positive selection
would result from large international differences in labor productivity, small international differences in the return to skill, and/or migration costs that do not increase in skill too strongly. In Australia, Europe, and North America, high labor productivity attracts more-educated immigrants from low-income countries, despite the fact that many of these individuals could earn a higher annual percentage return on their schooling at home.

4. *Emigrants sort themselves across destinations according to income-earning possibilities, with the countries that have the highest incomes for skilled labor attracting the most educated mix of immigrants.* The ability of a country to attract more-skilled emigrants appears to depend on its reward to skill relative to other destinations. Thus, Australia, Canada, the United Kingdom, and the United States, in which high-skilled workers enjoy relatively high earnings, attract a more skilled mix of emigrants than continental Europe.

5. *Empirically, the impact of opportunities for skilled emigration on the stock of human capital in a country is unknown.* In the last decade, a new theoretical literature has emerged which takes a more sanguine view of brain drain. While the idea that skilled emigration raises the incentive to acquire skill in a country is plausible, the literature is missing well-identified econometric estimates of how human capital accumulation and economic growth respond to labor outflows. We still do not know whether opportunities for skilled emigration create brain drain or brain gain.

6. *There is some evidence that emigration puts upward pressure on wages in sending countries.* In the short run, economic theory suggests the exodus of labor from a country would raise wages. Evidence from Mexico indicates that emigration has increased wages for the skill groups and regions with the highest emigration rates. The preponderance of relatively highly educated individuals among emigrants suggests labor outflows may have adverse consequences on sending countries’ public finances. However, in the case of India the fiscal effects of skilled emigration appear to be small. If emigration affects the wage structure, one would expect that it also affects housing prices, but research on how labor outflows impact real estate values is scant.

7. *Migrant remittances tend to positively correlated with household consumption and investments in education and entrepreneurial activities in sending countries.* For households sending migrants abroad, remittances may largely replace income lost due to lower labor supply on the national labor market. Remittances appear to decline with a migrant’s time abroad, suggesting the sending country income boost from emigration may not be long lived.

Despite recent advances in the theoretical and empirical analysis of international migration, there is still a great deal that we do not know about global labor movements. Much of the individual-level data on international migration covers Mexico and/or the United States, which are the subject of a
large literature. As the largest sending country and receiving country, there is still more to learn about the Mexico-U.S. context. Yet, the highest payoff to research is likely to be in the many under-studied parts of the world. Since 1990, Central and Eastern Europe have become major sending regions; the Gulf States, Russia, and Spain have become an important receiving regions; and emigration from China, India, Indonesia, Pakistan, and the Philippines has accelerated, to name but a few of the recent developments in global labor flows.

Among the many questions about international migration that deserve further study, I would emphasize the following:

- We know little about the magnitude of international migration costs. What is the relative importance of uncertainty, credit constraints, and destination-country admission policies in keeping the poor from migrating to rich economies?
- While there is evidence that migration networks play an important role in reducing moving costs, the dynamics of networks are poorly understood. Are there diminishing returns in the impact of network size on migration costs? Or does the existence of networks imply that spatial opportunities for emigration will only become more unequal over time?
- We still know little empirically about the factors that determine who leaves different countries. What are the contributions of international differences in labor productivity, returns to schooling, and migration costs to migrant selection? How does the exodus of skilled labor affect the wage structure, housing values, and the real exchange rate?
- Given the importance of human capital in economic development, how skilled emigration affects a country’s relative supply of skill is a question of first-order policy importance. How do changes in education, tax, or other policies in developing countries affect skilled emigration, the domestic supply of skill, or remittances from skilled emigrants?
- Sending and receiving countries are still far from having equal factor prices, in which case we might expect to see trade, migration, and FDI to happen concurrently, even reinforcing one another. How does migration interact with international trade and foreign direct investment?
- The inflow of remittances has been a welcome financial boon for many labor-exporting countries. Do remittances in fact help deepen domestic financial markets, as households use banks or other intermediaries to manage lumpy income receipts from abroad?

Within the development policy community, there are calls for rich countries to open their economies more widely to labor inflows from poor countries (e.g., Prichett, 2006). Completely open borders are off the table politically. Were the developed world to propose an increase in immigration quotas, should developing countries take the offer? The answer would depend on how
destination countries structured the additional labor inflows. An increase in immigration quotas that targeted workers with higher levels of skill could raise global income, even as it hurt the less-skilled majority in source countries (Benhabib and Jovanovic, 2007). Quotas targeted to less-skilled workers could raise global welfare. The adoption of such a policy would surely face opposition in receiving countries over concerns about fiscal and labor-market consequences. Getting sending and receiving countries to coordinate on international migration is a difficult task. A helpful first step would be to determine if the interests of the two groups of countries are really as far apart as they seem.
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In this paper, the author selectively reviews academic literature on the causes and consequences of emigration from developing countries. His aim is to identify facts about international migration that are relevant to those concerned about why labor moves between countries and how these movements affect sending-country economies. Empirical work on global labor flows is still in an early state. As is often the case, the literature provides incomplete answers to some of the most urgent questions. Nevertheless, recent work yields a number of robust results and is helpful for identifying where future research should be directed.

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