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PEOPLE FLOWS IN GLOBALIZATION

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## **ABSTRACT**

People flows refers to the movement of people across international borders in the form of immigration, international student flows, business travel, and tourism. Despite its peripheral status in debates over globalization, the movement of people from low income to high income countries is fundamental in global economic development, with consequences for factor endowments, trade patterns, and transfer of technology. In part because people flows are smaller than trade and capital flows, the dispersion of pay for similarly skilled workers around the world exceeds the dispersion of the prices of goods and cost of capital. This suggests that policies that give workers in developing countries greater access to advanced country labor markets could raise global economic well-being considerably. The economic problem is that immigrants rather than citizens of immigrant-receiving countries benefit most from immigration. The paper considers "radically economic policies" such as auctioning immigration visas or charging sizeable fees and spending the funds on current residents to increase the economic incentive for advanced countries to accept greater immigration.

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The policy debate over globalization in the past decade has largely bypassed the international mobility of labor. Restrict trade and cries of protectionism resound. Suggest linking labor standards to trade and it's protectionism in disguise. Limit capital flows and the International Monetary Fund is on your back. But restrict people flows? That's just an accepted exercise of national sovereignty! During the last few decades, when most countries reduced barriers to trade of goods and services and liberalized financial capital markets, most also sought to limit immigration. In this essay, I examine what we know about the causes and consequences of immigration. I argue that people flows are fundamental to creating a global economy and that the interplay among immigration, capital, and trade is essential to understanding the way globalization affects economies. I consider ways to reduce barriers to immigration that could improve the well being of workers around the world.

### **The New Global Immigration**

The United Nations has estimated that in 2000 around 175 million people or 2.9 percent of the world lived outside their country of birth. Furthermore, the United Nations has projected an increase in immigrants to about 190 million by 2005, more than twice as many as the 82.5 million immigrants in 1970 (International Organization for Migration, 2005a; United Nations, 2004, Table 2, p. viii). Two-thirds of immigrants are in advanced countries, where 8.7 percent of the population are foreign-born, compared to developing countries, where 1.5

percent of the population are foreign-born (United Nations, 2004, Table II.7, p. 43). About 10 percent of immigrants are refugees.<sup>1</sup>

Table 1 shows that the single biggest recipient of immigrants was the United States. Since Congress enacted the 1965 Immigration Act, which ended quotas based on national origin, immigration to the United States has increased greatly. In 1964-69, Canada, Australia, and New Zealand admitted more immigrants than the United States, but by 2000-2002, the United States admitted more than twice as many immigrants as these countries. In 2000, the 35 million immigrants to the United States constituted 12.4 percent of the population, up from 4.7 percent in 1970. Because most immigrants are of working age, the immigrant proportion of persons aged 25-39 was higher at 19.4 percent. Immigrants made up approximately half of the 1990s job growth in the United States and added 2.3 million new workers during the slower job growth of from March 2000 to March 2004, when native-born employment was roughly constant (Camarota, 2004, Table 1).

The second biggest recipient of immigration was Russia – the result of the collapse of the Soviet Empire, which induced many persons of Russian ancestry to move to Russia and which turned internal migration within the Soviet Union into international migration. Germany is third with 7.3 million immigrants, followed by a diverse set of countries with 4-7 million immigrants, such as Ukraine, Saudi Arabia, France, Australia, Canada, and India and Pakistan.

Measured by the proportion of foreign born, the listing of countries changes. Middle

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<sup>1</sup> Estimates of the number of immigrants in a country usually come from Censuses of Population, and in principle include illegal immigrants. But many illegal immigrants try to

Eastern countries were the largest recipients of immigrants: in the United Arab Emirates, 68 percent of the population are guest workers, Kuwait has 49 percent foreign-born; Jordan has 39 percent foreign-born, largely from Palestine; and Israel has 37 percent foreign-born, largely from Russia (United Nations, 2002, Figure 2). The percentage of immigrants in Canada (18 percent) and Australia (23 percent) exceeds the percentage in the United States

Even in advanced countries with smaller immigrant proportions, major cities attract people from all parts of the globe. In 2000, 23 percent of Parisians were born outside France; 28 percent of London residents were born outside the United Kingdom. Immigrant proportions are also high in major cities in some developing countries – 30 percent of the population in Abidjan, Nigeria, for instance, were born outside Nigeria. In many countries, agricultural and mining workers are immigrants, often undocumented, from lower income economies: Dominicans work in Puerto Rico; Haitians work in the Dominican Republic; Africans from nearby countries work in South Africa, and so on.

Table 1 shows that the top migrant-sending countries are China, with 35 million natives moving to other countries, India (20 million) and the Philippines (7 million) (International Organization for Migration, 2005a) – all low income countries.

The years of schooling and occupational attainment of immigrants relative to natives varies greatly among receiving countries and source countries. Many U.S. immigrants, (particularly those from Mexico) have less than high school education, while at the same time many have advanced degrees. For instance, in 2000 45 percent of U.S.-based Ph.D. economists and 55 percent of U.S.-based PhD natural scientists aged 45 years old or younger

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avoid government enumerations, so estimates probably understate immigrant numbers.

were born outside the United States (tabulated from Ruggles et al., <<http://www.ipums.org>>).

In some other countries immigrants are disproportionately highly skilled. Immigrants to Australia are twice as likely to have university degrees as natives and 60 percent of immigrants to the United Kingdom are professionals. The substantial flow of educated persons from developing countries to advanced countries has brought the issue of “brain drain” from the predominantly low-income migrant-sending countries to the fore in discussion of international migration.

### *Shifting Patterns of Migration*

Current international migration differs from the mass immigration of the nineteenth and early twentieth century in several ways. First, the numbers involved currently are smaller relative to world population. For instance, the 8.8 million immigrants who came to the United States in 1901-1910 period is of similar magnitude to the 9.1 million immigrants who came in the 1991-2000 period, but both the U.S. and world populations were much larger than in 1901-1910. Second, nearly half of current immigrants are women, whereas in the past immigrants were disproportionately men. Third, the primary destinations of inflow and outflow are different. In the nineteenth century, the primary flow of immigration was “poor and huddled” Europeans seeking a better life in the Americas (Hatton and Williamson, 1998). From the 1830s through the 1920s, 13 percent of Europe’s labor force migrated; in Ireland and Italy some 30 percent of the labor force migrated. In contrast, immigrants today consist largely of persons of non-European ancestry moving from poor countries to wealthy countries.

Traditional European immigrant source countries such as Ireland, Italy, and Spain have become immigrant-receiving countries, while formerly immigrant-receiving Latin America has become a source of emigrants. With low birth rates in wealthier countries, and a growing share of the world's population in Asia, Africa, and Latin America, migration from low income countries to the advanced countries is likely to continue.

#### *An Aside on Temporary Migration*

Permanent immigration, on which this essay focuses, is not the only form of people flows in the global economy. Low-cost travel coupled with employment and educational opportunities in other countries has led many persons to cross national borders for temporary periods.<sup>2</sup>

*Temporary or guest workers* are recruited for specific jobs for fixed periods, often in such industries as construction or seasonal agriculture or manufacturing. In the 1960s through the early 1970s, Germany recruited upwards of 2.6 million guest workers, mostly from Turkey. Between 1942 and 1964, the United States recruited some 4.6 million Mexican *braceros* to work on farms – roughly nine times as many Mexicans as came as immigrants (Martin, 2001). South Africa recruits more than 100,000 foreign workers annually for its gold

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<sup>2</sup> Economic transformations of developing countries have also created massive rural-urban migration within countries. Migration within some developing countries is comparable to international migration, both in the distance involved in the migrant move and in the impact of the move on lifestyles. Since 1950, the urban share of the world's population grew from 30 percent to about half, largely through within-country migration. China severely restricted rural-urban flows through the early 1980s, but then economic reforms that weakened government control over the economy and relaxation of residence rules produced the largest people flow in history, as approximately 150 million rural Chinese moved to urban areas during China's 1990s-2000s export-oriented growth spurt.

and coal mines. The oil-producing countries recruit temporary migrants to do everything from housekeeping to construction to professional work.

There is little international regulation of temporary migrant work. The International Labor Organization has two conventions on migrant labor, but relatively few country signatories.<sup>3</sup> The General Agreement on Trade in Services, incorporated into the World Trade Organization, was designed to ease temporary migration of service workers but has not yet produced any agreements. Many temporary migrant source countries negotiate bilateral treaties with migrant using countries to protect their citizens from exploitation of various forms.

In addition to temporary workers, there are *international students*, who travel overseas on student visas for their schooling and who in principle intend to return to their home country upon completing their schooling. In 2004, there were approximately two million international students. The United States is the largest single student destination, with 573,000 overseas students, one-fourth from China and India. But other countries compete in the market for international students. Some Australian universities give foreign students, largely from Asia, a bachelor's degree for studying three years in their native country and one year in Australia, and the students get points that make it easier for them to migrate to the country permanently.

*International tourism*, defined as the temporary movement of people across national borders for vacations, holidays, visiting family or friends, and business trips, is another major

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<sup>3</sup> Specifically, 44 countries signed Convention No. 97 of 1949 concerning Migration for Employment and 18 countries signed Convention No. 143 of 1975 concerning Migrations in Abusive Conditions and the Promotion of Equality of Opportunity and Treatment of Migrant Workers (Ruhs and Chang, 2004, Table 2, p. 93; see also <<http://www.ilo.org/ilolex/english/newratframeE.htm>>). The United States has not signed either of these Conventions.

people flow. The World Tourism Organization estimates that there were 760 million international tourist arrivals in 2004: 19 percent for business, 54 percent for vacation/holidays, and the remainder for personal reasons. Since 1970 international tourist arrivals have more than tripled.

### **What's Bigger: People Flows, Trade, or Capital Flows?**

There is no single metric on which to compare the economic importance of people flows, trade, and capital flows. Therefore, I compare the relative sizes of the three components of globalization with a few different measures.

First, I calculate immigration, trade, and foreign capital flows relative to the global workforce, global production, and global investment activity, respectively. As shown earlier, the stock of immigrants is nearly 3 percent of the global workforce and 9 percent of the workforce in advanced economies. By contrast, the ratio of world exports to world GDP was 27 percent in 2004. But exports are measured as sales, while GDP is a value-added measure, which excludes the purchases of materials and products from other sectors. Taking total sales as roughly twice GDP, a more valid measure of international trade's share of world output would be around 13 percent. Foreign direct investment averaged between 2 and 3 percent of global gross capital formation per year from the 1970s through the late 1980s. Since then, foreign direct investment has been volatile, rising to 20 percent of global gross capital formation in 2000 but it then falling to 7.5 percent of gross capital formation in 2004 (UNCTAD, 2004). An alternative measure of the globalization of capital markets is the share of foreign equities in investors' equity portfolio, which rose from negligible numbers in the 1970s to about 15 percent in the early 2000s (Stultz, 2005, Figure 3). Each of these

comparisons suggests that trade and international capital flows are a larger proportion of activity in goods and capital markets than immigration is in labor markets, presumably because governments have reduced trade barriers and liberalized capital markets but have not lowered barriers to immigration.<sup>4</sup>

Another way to gauge the extent of globalization in labor markets versus other markets is to contrast the dispersion of wages with the dispersion of the prices of goods and dispersion

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<sup>4</sup> Factor content analysis is another way to put the three components of globalization in context. This uses labor input coefficients by industry to transform the imports and exports of goods into the number of workers of different types and capital that might have produced (or not produced) the goods absent trade. Borjas, Katz, and I (1997) estimated that immigration affected the U.S. skill distribution more than trade. The huge immigration of less skilled workers from Mexico dominated the differences in the skill mix between workers in import-intensive and export-intensive industries. These calculations generated debate about the appropriate counterfactual for factor content analysis (Krugman, 2000; Deardorff, 2000; Leamer, 2000) and the appropriate input ratios (Wood, 1994; Borjas, Freeman and Katz, 1997). In countries with less immigration than the United States, trade should have a greater impact on implicit factor supplies.

of the cost of capital. Trade and factor flows are supposed to equalize prices across countries. Reductions in barriers to trade and liberalization of capital markets notwithstanding, wages in similar occupations vary more around the world than do prices of nominally similar bundles of goods and the cost of capital. This suggests that the labor market is the least developed part of globalization.

Table 2 documents the huge variation in wages for roughly comparable workers in the 1998-2002 period, using the Occupational Wages Around the World dataset. The table shows the range of pay across five occupations, transformed from national currencies to U.S. dollars using market exchange rates in three of the columns and using purchasing power parity exchange rates in three other columns. It gives the wages for the country at the top 20% point of the earnings distribution and for the country at the bottom 20% point of earnings distribution for each occupation. The ratios of wages measured in exchange rates between countries in these two positions are on the order of twelve to one. The ratios of wages measured in purchasing power parity units between countries in these two positions are on the order of four to five to one. The pattern of huge country differences is found for other occupations in the data file as well.

The dispersion of prices for nominally similar goods is much less than the dispersion shown in Table 2. Consider, for example, the price of a well-known commodity, McDonald's Big Mac sandwich (data are for 65 countries from

[http://www.economist.com/markets/bigmac/displayStory.cfm?story\\_id=2708584](http://www.economist.com/markets/bigmac/displayStory.cfm?story_id=2708584)  
<http://www.skgfriends.com/big-mac-index.htm>). In 2004 the price of a Big Mac at the 80<sup>th</sup> percentile of Big Mac prices based on exchange rates was \$2.65 while the price of a Big Mac in the countries at the 20<sup>th</sup> percentile of Big Mac prices was \$1.40 – a 1.9:1 spread. The comparison using purchasing power parity exchange rates is even closer.

Finally, variation in the cost of capital is also much lower than variation in wages. Hail

and Leuz's (2004, Table 1) estimates of the international differences in the cost of capital show a variation between the return at the top 25<sup>th</sup> percentile to the return at the bottom 25<sup>th</sup> percentile that averages 1.43 across estimates from five different sources.

These differences in the dispersion of wages and prices suggest that globalization has not reduced wage differences among similarly skilled workers as much as it has reduced price differences and differences in cost of capital. Indeed, geographic variation in wages and living standards around the world gives the global economy the appearance of a gated wealthy community consisting of the advanced countries, surrounded by impoverished ghettos, with immigration restrictions preventing the ghetto residents from moving to where their productivity and well-being would be higher.

## **The Economics of People Flows**

Why do immigrants come? How do they do? How do immigrants affect their destination countries? How does emigration affect source countries? Analyses provide clear answers to why people immigrate and how they do in their new country. There is considerable and often heated controversy over the impacts of immigration on destination and source countries.

### *Why Do Immigrants Come?*

For economic gain, says the economist. Through social networks, says the sociologist. Over short distances, says the geographer. For family reasons, say the rules for visas in many countries. All are right. The flow is from countries with low GDP per capita to countries with

high GDP per capita and is greater the smaller the distance between countries (Borjas, 1987; Kamemera, Oguledo and Davis, 2000; Clark, Hatton and Williamson, 2002). In the late 1990s, the ratios of source country GDP per capita to receiving GDP per capita among 15 OECD immigrant receiving countries were all below one. The average of the ratios was 0.57, which implies that receiving countries had incomes that were 57 percent of those in source countries. Weighting the ratios by numbers of immigrants, to count countries with more immigrants more heavily, gave a lower average ratio of 0.44 (based on data in Coppel, Dumont, and Visco, 2001, table 5).<sup>5</sup> Mayda (2005) reports that economic conditions in recipient countries were stronger determinants of immigration flows in the 1980s and 1990s than conditions in source countries, in the sense that a strong economy in the former was more likely to attract immigrants than a weak economy in source countries. Economic factors motivate the huge levels of illegal immigration, as well, producing a multi-billion dollar illegal industry that transports some four million people across borders annually worldwide. Passel (2005) estimates that on the order of seven million illegal immigrants worked in the United States in 2005. Wickramasekera (2002, p. 19) estimates annual worldwide illegal trafficking in people of about six million.

Are international immigrants positively selected from their source countries? The ideal data to answer this and related questions about relative skills would record a person's economic performance in their home country before they immigrated and their performance in the receiving country (along with similar data for non-immigrants in both countries), but

<sup>5</sup> Mean differences in incomes across countries are the main driver of international migration. However, the shape of the income distribution in source and receiving countries can also affect the rate and composition of immigration (Borjas, 1987). Consider two countries with similar mean incomes but with different dispersions of income. A low-wage worker could earn more in the country with the smaller dispersion of income, while the high wage worker could earn more in the country with the greater dispersion. Indeed, high paid workers move from Europe, where institutional wage setting and income tax rates reduce wage dispersion, to the United States, where earnings are highly unequal and taxes are lower.

standard longitudinal surveys do not follow persons across country lines. Hendricks' (2002) tabulations of the years of schooling of immigrants to the United States by country of origin, and of the average years of schooling in country of origin, provides the strongest available evidence for positive selection (United Nations, 2004, Box IV.1, p 98). These data show that immigrants average 12.9 years of years of schooling compared to an average of 5.7 years of schooling in the countries from which they come. But the educational composition of particular immigrant flows can diverge from the general pattern. Ramos (1992) and Castillo-Freeman and Freeman (1992) found that migrants from Puerto Rico to the United States consisted disproportionately of less-educated workers, who had greater chances of employment at higher earnings on the mainland than on the island. Ibarraan and Lubotsky's (2005) analysis of the 2000 Mexican Census shows that recent migrants from Mexico tend to be less educated than non-migrants. Shorter distances makes it easier for these less educated immigrants to come to the United States. Many immigrants with less than high school education are from Mexico and El Salvador, who often enter the United States illegally. In 2000, about 8 percent of the Mexican-born population was living in the United States and 30 percent of Mexicans with formal sector jobs worked in the United States (International Organization for Migration, 2005a, p. 196).

The source countries for immigration differ among advanced countries for historical reasons that reflect the influence of social networks. Former territories and colonies are an important source of arrivals for England and France. Vietnamese migrate to Australia and the United States due to ties built up from the Vietnam War. Turks are a prime immigrant group in Germany. Specific locales in developing countries are major sources of immigration – for instance, some districts in Guangdong, Fugian, and Zhejiang in China, or Sylhet and Mirpur in Bangladesh and Pakistan have many emigrants, while few persons leave from other areas in these countries. The most plausible explanation is that persons follow the lead of others from

their area. Once a group enters a country, moreover, relatives immigrate to reunify families. About 70 percent of U.S. immigrants enter as immediate relatives of citizens or are family-sponsored. The proportion of immigrants for family reunification is equally high in France, and significant in other countries as well (OECD, SOPEMI 2001, Trends in International Migration, chart 1.2; International Migration Organization, 2005a, p. 388).

### *How Do Immigrants Do?*

U.S. data show that immigrants earn less than the native-born overall and less than the native-born with the same years of schooling, but that these differences decline over time. In addition, immigrant/native earnings differentials vary across cohorts, as the human capital “quality” of immigrants changes largely due to changes in the proportion of immigrants coming from countries with more/less schooling (Borjas, 1992). In other immigrant-receiving countries, immigrants also earn less than otherwise comparable natives, but with considerable variation in magnitudes (Adsera and Chiswick, 2004). In most advanced countries, immigrants have higher unemployment rates and lower employment rates than native workers (OECD, SOPEMI, 1998, Figure 1). The United Kingdom is a partial exception, where immigrants have higher skills and earnings than the native-born, but also have higher unemployment than natives (Glover et al., 2001; Kahn, 2004). As immigrants accrue experience and assimilate, they close some of the gap in earnings or occupational attainment in most countries, even when the number of immigrants is huge, as in Israel in the 1990s (Eckstein and Weiss, 1998).

But the more striking difference is between the earnings of immigrants their new

country and what comparable persons earn in their home country, particularly among less skilled workers. For example, in 2000 a Mexican with 5-8 years of schooling earned \$11.20 per hour in the United States compared to around \$1.82 per hour in areas of Mexico with high rates of migration to the United States -- a six-fold difference.<sup>6</sup> The huge gains in income that immigrants from a low-income country obtain by moving to a high-income country virtually guarantees that most of the gains to immigrants occur not because of positive selectivity of immigrants but rather because high-income countries have more complementary inputs: higher capital-labor ratios, more modern technology, superior infrastructure, more efficient markets due to greater legal protections of property and persons, and lower levels of corruption and rent-seeking.

The effect of differences in capital-labor ratios and in the organization of markets on the earnings gain to immigrants who move from a developing country to a developed country can be estimated crudely. To assess how much of the difference in earnings between similarly skilled persons in advanced and developing countries could reasonably be attributed to differences in capital-labor ratios, assume that production is governed by a Cobb-Douglas production function. Then if the wage is equal to the marginal product of labor, the wage depends on the capital/labor ratio raised to a power that equals capital's share of output. Capital labor ratios in the advanced world are roughly eight times those in developing

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<sup>6</sup> U.S. figures for Mexican-born with 5-8 years of schooling from the 2000 Census, Integrated Public Use Microdata Series, defined as annual wage and salary income divided by numbers of weeks worked and usual hours worked. Mexican figures from Hanson (2005), table 7, for men 30-59 with 6-8 years of schooling. The \$1.82 is an unweighted average for three age groups. Adjusted for purchasing power parity exchange rates, this is a differential of four times.

countries. Assuming that capital's share of output is 0.30, wages in high-income countries will be 87 percent higher than low-income countries.<sup>7</sup> However, as Table 2 demonstrated, advanced country wages typically exceed those of developing countries by four to twelve times. This calculation is supported by other findings. Hendricks (2002) approximates earnings of workers by real GDP per capita and estimates that, after taking account of differences in years of schooling and physical capital, there remain differences in earnings between immigrants in the US and persons in the low wage countries from which they came of a multiple of five to eight. Oostendorp and I (2001, 2003) use the Occupational Wages Around the World data file, which contains estimates of wage rates in 161 detailed occupations in over 150 countries, to estimate the relation between capital-output ratios, average years of schooling, and indicators of the efficacy of competitive markets (from the Fraser Institute Economic Freedom data file) and earnings in the same detailed occupations

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<sup>7</sup> Let the production function be:  $Y = K^\alpha L^{1-\alpha}$ , where output is Y, capital is K, labor is L, and where capital's share of output is  $\alpha$ , and labor's share of output is  $1 - \alpha$ . Differentiate with respect to labor to get the marginal product of labor,  $dy/dL = (K/L)^\alpha$ , and assume that the wage equals the marginal product. Then if  $K/L$  is 8 times larger in high-income countries, the wage will be  $8^\alpha$  times larger. With an  $\alpha$  of .3, the wage is 1.87 times larger in high-income than in

across countries. These factors explain part of the cross country variation of earnings, but the huge initial variation in earnings among countries almost guarantees a substantial country wage gap, which may reflect the differences in underlying technologies of production.

As a result of the huge rise in productivity and earnings that an immigrant gains from working in an advanced country, the earnings of small numbers of immigrants in an advanced country can be large relative to the national incomes of their home countries. The 0.1 percent of India's population living in the United States earn roughly the equivalent of 10 percent of India's national income (Desai et al., 2001).

### *How Do Immigrants Affect Their Countries of Arrival?*

Because immigrants are largely young working age persons, immigration reduces the average age of the population in immigrant-receiving countries. Even so, immigration does not provide a ready solution to the problems of retirement and pensions that face many developed economies. Younger immigrants eventually become elderly, and many have children who require social spending like education. Rates of immigration far above existing rates for immigration would be necessary to make a major contribution to resolving problems of aging populations. For example, the United Nations estimates that for immigration to stabilize the ratio of the number of retired persons divided by the number of workers, from 1995 through 2050 1.7 million persons would have to immigrate to France annually, compared

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low-income countries.

to an actual total of 140,000 immigrants in 2001. Stabilizing the old-age dependency ratio in the United States over the same period would require that 10.8 million persons immigrated annually (UN, Replacement Migration, 2000, table IV.4, table IV.7), which compares to 1.1 million immigrants in 2001. For immigration to stabilize the dependency ratio by 2050, 32 percent of the French population and 27 percent of the U.S. population at that time would be post-1995 immigrants.

In the basic model of immigration, immigrants reduce earnings of substitute factors and raise the earnings of complementary factors, where complements might include capital and some types of native-born labor. Figure 1 uses the marginal product of labor schedule to examine how an increase in the supply of labor due to immigration affects the earnings of workers for whom the immigrants are assumed substitute. The line S is the initial supply of labor. Immigration of I persons increases the supply to S'. This reduces the wage from  $W_0$  to  $W_0'$ . Total output increases by the trapezoid DEGH, but much of this gain accrues to the immigrants. The gain to residents is the welfare triangle DKE, which consists of the loss in incomes to factors that substitute for immigrants of BADK and a gain to factors complementary to immigrants. Using variants of this model, most empirical analyses of the effect of immigration on receiving country economies seek to estimate the adverse effect of immigrant supply shocks on the earnings of native substitutes. This approach does not mean that economists are excessively focused on the costs of immigration. With constant returns to scale production, the loss to substitute natives also identifies the gains in income to

complements and the size of the welfare triangle.<sup>8</sup> If immigration had no adverse effects on native substitutes in this model, immigration would also have no beneficial effects on other factor earnings.

Because immigrants concentrate in particular gateway cities or areas, a natural way to examine how immigration affects natives is to compare native earnings and employment between high- and low-immigrant areas. Since studies of the minimum wage generally yield low estimated elasticities of demand for less-skilled workers (Brown, 1988; Card and Krueger, 1997), we might expect area studies to find that immigration has huge wage effects in local markets. After all, when demand is inelastic to wages, wages must change substantially to accommodate changes in supply. In fact, studies find the opposite. For the United States, Freidberg and Hunt (1995) report that a 10 percent increase in the fraction of immigrants in the population reduces native wages by at most 1 percent. Card (1990) found virtually no

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<sup>8</sup> Let  $W$  = wage,  $S$  = supply of factors for whom immigrants are substitutes,  $\Delta$  be the change operator and  $I$  be the increase in supply from immigration. Then with constant returns to scale, the welfare gain is  $(\frac{1}{2}) I \Delta W$ , where  $\Delta W$  is the reduction in the pay of substitute factors due to immigration. If  $\eta$  is the elasticity of demand for substitutes, then  $\Delta W/W = -1/\eta I/S$  and the welfare gain will be  $1/2\eta (I)^2 (W/S)$ . Increasing or decreasing returns to scale would alter the benefits or costs of immigration on natives.

labor market effect of the 1980 Mariel boatlift of low-skill immigrant Cubans into the Miami area; Hunt (1992) found only slight effects from the return of the *pied noir* from Algeria to France in 1962; Carrington and deLima (1996) found no effect of the return of Portuguese colonists from Africa to Portugal.

What explains the modest or negligible relation between immigration and native wages or employment in local labor markets? One possible explanation is that immigration induces offsetting internal migration of the native-born population. This hypothesis has some plausibility. For example, low-skilled workers from the Midwest migrated to California in the 1980s-1990s at lower rates than they had before the large flow of Mexicans to California. However, the fact that differences in earnings across local labor areas within a country persist over decades makes it implausible that internal migration could entirely offset the effects of a huge immigrant flow in a decade. Analysts have reached no consensus about the extent to which internal migration explains the absence of any relation between immigration and wages among local labor markets (see the conflicting views in Borjas, Freeman, Katz, 1997; Filer, 1992, Card, 2001).

Another possibility is that the immigrant flows induce capital flows to an immigrant-receiving area. If this investment leads to the growth of immigrant-employed industries that sell output at fixed world prices, then wages would not respond to changes in labor supply (Leamer and Levinsohn, 1995). This explanation also has some *prima facie* plausibility: for example, in New York and Los Angeles apparel industry “sweatshops” have grown that use immigrant labor extensively. But no study has estimated the extent to which the changing

industry mix in immigrant-intensive areas explains the modest impact of immigration on the wages of native workers in those areas.

Finally, many immigrants may have sufficiently different human capital from natives that they are complements for nominally similar native-born workers. Mexican immigrants with less than high school education have an average of three years less schooling than Americans with less than high school education – although in studies of the U.S. labor market they are both counted as low-skilled. And less educated Mexicans work in a different set of occupations and industries than most less educated Americans: for example, 6.5 percent of Mexican immigrants work in farming, compared to 0.5 percent of the U.S. native work force. Also, low educated Mexicans are disproportionately represented in low skill construction jobs, and in hotel and food services in particular regions where immigrant shares are high (Grieco and Ray, 2004). Immigrants make up 45 percent of tailors, 40 percent of farm workers, 38 percent of taxi and limo drivers, 34 percent of private household workers, 31 percent of laundry and dry cleaning operatives. In sports, immigrants make up 27 percent of major league baseball players and 47 percent of minor league baseball players (tabulated from Ruggles et al., 2004). But no study has estimated the impact of differences in skill mix or occupational composition as a way to explain the modest effect of immigrant flows on native labor.

Perhaps the most prominent evidence that immigrant flows affect native wages is from Borjas (2003), who analyzes how time series variation in immigrant flows by education and cohort affect native earnings nationally. This mode of analysis seems particularly well-suited

for assessing the effect of highly skilled immigration on native substitutes since the markets for university graduates is national in scope, with high mobility across areas. Indeed, looking at the labor market for Ph.D.s, Borjas (2005) finds that an immigration-induced increase in the supply of doctorates in a particular field depresses native earnings in that field with an elasticity of about 0.30. But the same story does not seem to apply to the country with the greatest immigration of highly educated persons, Israel, where the huge flow from the former Soviet Union had no discernible impacts on native outcomes (Friedberg, 2001, Weiss, 2000).

### *How Does Emigration Affect Source Countries?*

In principle, the impact of emigration on source countries can be illustrated by reversing the direction of the changes in Figure 1. A fall in supply of labor from  $S + I$  to  $S$  raises the wages of substitutes for immigrants and reduces the income of complementary factors, so that income in the source country falls.<sup>9</sup> However, this analysis ignores remittances from emigrants. The IMF estimates that in 2003, immigrants remitted approximately \$131 billion worldwide, \$79 billion of which went to developing economies (United Nations, 2004, Table IV.3, p. 107). If, as some believe, unrecorded remittances are twice recorded remittances, developing country immigrants may have sent back to their home country about \$160 billion. In small countries, remittances can account for a large share of GDP and foreign exchange. Even in a large country, remittances can greatly boost an economy. In the

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<sup>9</sup> Berry and Soligo (1969) analyze how the emigrant's effect on the home country depends on whether he or she owns capital, whether he or she takes that capital to the new country or leaves it in the home country, and the savings rate of the emigrant.

Philippines, remittances were 10.2 percent of GDP in 2003, up from 2.7 percent in 1990 (International Organization for Migration, 2005a, p. 240).

Looking at the effects on immigrant-sending communities, Unger (2005) reports that income grew more rapidly in Mexican municipalities that had high emigration than in those with low emigration and that per capita income growth was associated with the percentage of households that receive remittances across communities. Hanson (2005) found that areas in Mexico which have significant migration of less skilled workers to the United States had sizeable wage increases. This finding is consistent with O'Rourke and Williamson's (1999) analysis that earlier immigration from Ireland and Sweden raised wages in those countries in the 1800s and early 1900s. Still, taking both the loss of emigrant labor and the effects of immigration on remittances, trade and capital flows, empirical analysis does not reach any firm conclusion about whether emigration hurts or helps source economies.

Debate over the effects of emigration on home countries has focused on the emigration of highly skilled workers – “brain drain” – whose loss might be particularly harmful to the source country. Lowell, Findlay and Stewart (2004) estimate that in 2001 nearly one in ten tertiary-educated adults in the developing world resided in North America, Australia or western Europe. The magnitude of this flow varies among countries. Some 40 percent of university-educated adults from Turkey and Morocco reside in OECD countries. Over half of university-educated adults from the Caribbean live in the United States. In some African countries, more than 35 percent of citizens with college education reside abroad (Desai, Kapur and McHale, 2004). Still, in about two-thirds of developing countries less than 10 percent of

the tertiary-educated population emigrated (Carrington and Detragiache, 1998; Adams, 2003).

The traditional view of brain drain was that it is particularly harmful to developing countries, which invested in the schooling of the emigré but do not gain the social returns on that investment. To recompense the source country, Bhagwati (1976) proposed a tax on such immigrants. China has required prospective emigrants to pay a fee dependent on their education and years of work in China. If they have worked for sufficient years in China, there is no fee. But most countries do not exercise control over potential emigrants. And China along with other developing countries has not tried to reduce the flow of international students from their country, even though about 90 percent of Chinese Ph.D. graduates from U.S. universities choose to remain and work overseas for many years (Finn, 2003).

Emigration of doctors, nurses, and other highly educated medical and health specialists from developing countries raises especially great concerns. In some countries, a large proportion of health professionals are foreign-born, mostly from developing countries. In 2000, 23 percent of health professionals in the United Kingdom were born outside western Europe, making this the occupation with the highest percentage foreign-born in the country (Dobson et al., 2001, Table 13.12)

But even in this case, source countries have not tried to restrict the freedom of residents to migrate. The Philippines has adopted the opposite strategy: developing nursing schools that train their students for working in the U.S. medical system, so that they can more readily emigrate.

The reverse reading of Figure 1 suggests that the emigration of highly educated

workers should reduce national income for those remaining at home, particularly of the less educated. But the brain drain could benefit the source country in ways beyond remittances. The potential to migrate can raise the expected return to schooling and induce more persons to invest in skills (Beine et al., 2003), although this outcome would require that many who invest with the intention of going overseas do not in fact do so, and that there is a high social return to higher education in the home country. Emigrant scientists, engineers, or entrepreneurs working in an advanced country could create innovations that improve productivity in that country and thus lower the prices of the goods sold to their home country. Emigrant social networks could foster trade and capital flows between the home country and the receiving country; for example, Rauch and Trinidade (2002) find that immigrants to Canada increase imports from their home country by 3 percent and exports by 1 percent. A sizeable immigrant population in advanced countries may also affect the foreign policy of advanced countries toward the developing country. Increased immigrant Moslem populations in Europe have influenced European views of Israeli-Arab disputes.

Comparisons of the growth of countries with differing levels of emigration (Beine et al., 2003) support the view that some level of emigration can benefit the home country, but the evidence is limited (Commander, Kangasniemi and Winters, 2004). The economic effects of the brain drain and other people flows need to be analyzed as part of the broader pattern of the globalization of economic activity rather than as stand-alone phenomena.

### **People Flows, Mutatis Mutandis**

In models of international trade based on differing factor endowments across countries, either trade of final goods and services or movements of factors of production can serve to equalize prices and earnings (Mundell, 1957). If country A has more labor relative to capital than country B, it can send labor to country B directly through immigration or indirectly through the export of labor-intensive goods. Restrict immigration, and trade should increase. Restrict trade, and immigration should increase. In the debate in the early 1990s over the North American Free Trade Agreement (NAFTA), treaty proponents argued that by creating more jobs and higher wages in Mexico, the treaty would reduce migration to the United States (International Organization for Migration, 2005a, pp. 194-5). If immigration and trade are limited, capital flows will substitute for them and create pressures toward equalizing marginal productivity around the world.

But trade, people flows, and capital flows were not substitutes in the U.S. economy during the 1980s-2000s, when imports of goods and services, and financial capital, and skilled and unskilled immigrants increased. In the 1870-1940 earlier period of mass immigration, trade and immigration do not appear to be substitutes, either (Collins, O'Rourke and Williamson, 1997).

### *Technology and Complementarities*

So why might people flows be complements rather than substitutes for trade and capital flows? One plausible explanation is that countries differ in technology (Markusen,

1983; Markusen and Svensson, 1985). If an advanced economy uses more productive technology than a developing country, then returns to both labor and capital will be higher in the advanced economy and both factors will migrate there (Gierking and Mutti, 1983). Davis and Weinstein (2002) present a model in which this outcome harms U.S. well-being, because with more workers and capital, the U.S. economy expands production of the high tech goods in which it has comparative advantage, driving down the price of those goods and thus the earnings of native workers and capital. At the same time, the flow of workers and capital reduces the production of the goods the U.S. imports from overseas, driving up the prices of imports. In one sense, the U.S. technological edge gives it a “monopoly rent” that gets spread over immigrant labor and capital in the United States and that falls as increased production lowers the terms of trade. On the other side, advocates for the immigration of skilled immigrants argue that they help produce a technological edge for the country, which benefits all U.S. citizens.

People flows might complement trade flows in other ways, too. Investing overseas often requires knowledge and monitoring of local conditions, ranging from local management or corporate insiders to regulatory and other decision-making bodies (Stultz, 2005). Large flows of foreign direct investment are thus accompanied by business trips and temporary assignments of executives to countries. Trade requires knowledge of suppliers, as well.

Off-shoring of work, in which a firm sends work overseas rather than recruiting the qualified worker to come to the advanced economy, fits the trade-immigration substitution story better. Both immigration and off-shoring should adversely affect the economic position

of substitute native workers, but the effects are complex. Some work cannot be sent offshore, because it requires capital and other complementary resources that are exclusive to the advanced country. Thus, immigrants might put greater pressure on native workers, since they could substitute for natives in all activities, whereas offshore employees would be limited in their activities. In this sense, substitute native workers might prefer off-shoring to immigration. On the other, immigrants are likely to be paid more in the destination country than workers doing off shored work in a source country, which creates less competitive pressure on native wages.

### *Immigration and Comparative Advantage*

Analyses of trade among advanced economies, which have similar costs of labor and factor endowments, posit that trade occurs because countries gain comparative advantage from being the first-mover on new technologies and/or from increasing returns -- say through learning as output increases or through positive spillovers from one firm to another or from sector to sector. Comparative advantage in turn induces factor mobility, which can alter factor endowments. The United States is a prime example of a country where immigration has responded to the country's technological edge and added to its comparative advantage. The United States has a comparative advantage in exporting relatively high technology products. It imports science and engineering specialists, who help the country maintain its position at the technological frontier. During the 1990s, the United States greatly increased the proportion of foreign-born workers among scientists and engineers, as shown in Table 3. Nearly 60 percent of the *growth* in the number of U.S.-based Ph.D. scientists and engineers over this decade came from the foreign born.

Could the U.S. economy maintain its comparative advantage in high-tech sectors absent the huge immigrant flow? This issue is critical in national science policy (Freeman, 2005). Presumably the country could expand support for research and development activity and for technology education in a way that could attract more citizens to these fields. But it would take some time for domestic supplies to replace immigrant supplies. In the interim, many multinationals might accelerate the on-going shift in research and development activities overseas, reducing the U.S. comparative advantage in high tech. At the same time, the greater the flow of immigrant scientists and engineers, the smaller will be the incentive for the native-born to choose these careers.

Many other advanced countries also seek highly educated immigrants. While the English-speaking countries have been leaders in seeking to attract educated immigrants, the major European countries have stepped up their efforts to attract top talent from developing countries and to retain their own scientists and engineers. Even Japan, which has traditionally shunned immigrants, has come to recognize the potential value of these particular immigrants. The response of the U.S. academic community to the more stringent visa policies for students post-9/11 and the ensuing response of the U.S. State Department to ease restrictions shows the extent to which countries compete in the global market for highly talented students (National Academy of Science, 2005).

## **More People Flows?**

Governments of receiving countries have hardened their stances against less-skilled immigrants and refugees in the past two to three decades, possibly in response to the increased

immigrant flows. In 1976 the United Nations surveyed national governments about their views toward immigration: 11 of 150 governments wanted more immigrants; 10 wanted fewer immigrants; while the rest of the countries were satisfied with their level of immigration. In 2003, the United Nations conducted a similar survey that covered 194 countries: 10 wanted to increase the number of immigrants, while 65 wanted to lower the rate of immigration (United Nations, 2004, Table III.2). Surveys show that the majority of citizens in most countries believe that their country should restrict immigration more than it does (ISSP, 1995; PEW Global Attitudes, 2003). In European Union countries with large welfare states, the major stated economic factor underlying opposition is the fear that immigrants will burden the welfare state (Dustmann and Preston, 2004). Persons who might be adversely affected by immigrants in the labor market show modestly more negative attitudes toward immigration than others (Scheve and Slaughter, 2001, for the United States; Dustmann and Preston, 2004, for the European Union).

However, public opinion and national policies toward immigration seems to rest on issues well beyond gains and losses in the labor market. Some natives worry that immigrants will present a cultural threat to their way of life and reduce social cohesion. This view is reflected in the attitudes of some Europeans toward immigrants from developing countries, particularly those from Moslem countries. Another factor that determines attitudes toward immigration is that immigrants eventually become citizens and affect politics. In the United States, both political parties seek support from the growing Hispanic community and tailor their policies on immigration to appeal to that community. In 2000 the AFL-CIO reversed its long-standing support for the employer sanctions law that criminalized the hiring of

undocumented immigrant workers and endorsed amnesty for millions of undocumented workers and repeal of the employer sanctions law. The underlying rationale was that the growing immigrant community would provide good recruits and political allies for unions, and that legalizing the workers would reduce the impact of such immigrants in reducing wages and opportunities for other workers.

### *Easing Immigration Restrictions*

The critical barrier to immigration is the restrictive policies of destination countries like the United States, Canada, Australia, the European Union, and Japan. If more persons immigrated to these countries, world GDP would rise and the inequality of wages among countries would presumably decline. As Dani Rodrik (2001) said: ‘If international policy makers were really interested in maximizing worldwide efficiency, ... they would all be busy at work liberalizing immigration restrictions.’ How might the world increase immigration?

The most widely discussed policy reform is to increase temporary migration. Mode 4 of the General Agreement on Trade in Services (GATS) is designed to enhance the temporary movement of service workers. The 2005 World Migration Report suggested that the international community develop a Temporary Foreign Workers Programme to stimulate and protect temporary migration (International Organization for Migration, 2005a, chapter 10; see also Brucker et al., 2002; Rodrik, 2001). Other proposals that could increase the number of immigrants and their contribution to economic well-being include providing greater protection to migrants through international law and developing better financial infrastructure for immigrants to make remittances to their home countries. Increasing the flow of temporary

immigrants under greater legal protection could produce economic gains for receiving countries without risking some of the social costs, but in the past temporary immigration has often led to permanent immigration.

While these temporary migration policies could increase the number of immigrants somewhat, it would take “radically economic” policies to have a major impact on immigrant flows and to move world output toward the levels that an unfettered movement of labor would produce.

### *Radically Economic Policies*

The most radically economic policy would be to remove the bulk of restrictions on international migration, placing immigration on a par with free trade and with the now largely free flow of capital. The idea of being able to move to a different country to work freely seems radical in this era of substantial immigration controls, but it was common in earlier periods. Many immigrants came freely to the New World in the days of colonization (the exception being slaves and transported convicts). Although the United States restricted immigration of some groups from the nineteenth century on, not until 1921 did the country seek to limit numerically the numbers who came. The United Kingdom did not regulate entry of foreigners who came to work until World War I; and introduced restrictions on immigration from the Empire and Commonwealth only with the Commonwealth Immigration Act of 1962. The United Kingdom and Ireland continue to have free immigration between them, and the European Union has an increasingly open labor market across member states. One interpretation of the U.S. acceptance of large numbers of illegal immigrants is that the country

does effectively have open immigration, at least for persons crossing the Mexican border.

However, because most of the gains from immigration accrue to the immigrants rather than to the residents of destination countries (as stressed earlier), there is little incentive for destination countries to ease immigration restrictions. The only way I can think of to increase the receptivity of destination countries to accept more immigrants would be redistribute the benefits of immigration so that a greater share of the benefits flow to natives and a lower share of the benefits to immigrants. The “radically economic” policy here would be to use the price system to equilibrate the market for immigrants rather than to ration entry. An immigrant receiving country could charge admission fees or auction immigration visas or place special taxes on immigrants, and use those funds to redistribute the gains from immigration to existing citizens.

Pricing entry into a country would simultaneously reduce the number of immigrants who want to come (many of who also cannot come under the rationing policies that receiving countries use) and would increase the number that receiving countries would admit.

Auctioning immigrant visas would assure that those who expect to gain the most from immigration and would be willing to pay the highest amount would be admitted. Natives who wanted to bring relatives in the United States or firms who wanted to bring particular workers to the country could sponsor immigrants. On the other hand, since young persons with limited capital who could gain greatly from immigration might be unable to fund themselves, they would be better served by paying an extra amount from future income taxes, in the same manner that Australia allows young persons to borrow for higher education and then repay with additions to future income taxes.

Charging admission may strike some readers as crass and offensive, inconsistent with Emma Lazarus's poem on the Statue of Liberty, but the proposal is not as radical as it might first seem.<sup>10</sup> American firms that use H-1B visas to bring skilled workers already pay the Immigration and Naturalization Service \$610, \$500 of which goes to a special fund for training U.S. citizens. An auction of the H-1Bs would almost certainly raise more revenue and redistribute more of the gains from this form of immigration from the companies or visa entrants to the country as whole. Canada has a successful special immigration track for Investor Immigrants, which is limited to persons with business experience and a net worth of at least \$800,000 (Canadian) who invest \$400,000 for five years in Canada. Insisting that the wealthy businessperson invest in the country is an indirect way of charging entry. The United States makes it easier for non-citizens who enlist in the military to gain citizenship. In the early part of the twentieth century, the United States had a head tax on immigrants.

How much might immigrants be willing to pay for citizenship in an advanced country? Since increases in income from immigrating from a low-income country to a high-income country can be quite large, the amount of money that could be raised by putting a price on immigration could be substantial, at the minimum on the order of the magnitude of the remittances that immigrants send home. For a worker who comes to the US from a low income country, where wages may be 20 percent of U.S. wages in purchasing power parity terms, the gains would conservatively be on the order of \$5,000 to \$10,000 per year for workers who earned around the U.S. median income. This annual difference would cumulate over a working lifetime to \$100,000, depending on the discount rate for future income. A fifty-fifty division of this gain would be substantial – if immigrants were charged \$50,000 apiece, one million additional immigrants would produce \$50 billion dollars in tax receipts.

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<sup>10</sup> This fits with the Bhagwati and Srinivasan (1983) analysis of the optimal policy for the United States to adopt with respect to immigration from Mexico and with Wong's (1983) analysis of the ordering of trade in goods and capital and labor mobility for welfare maximization.

This type of scheme does have potential deleterious non-pecuniary effects. Perhaps selling or auctioning immigrant visas would reduce the loyalty that new citizens feel to a country, or lead to greater illegal immigration, or antagonize groups in the country or outside in ways that would be harmful. Taxing immigrant A at higher rates than native B may strike many as unfair, particularly for immigrants in the lower parts of the income distribution. In addition, shifting some of the gains to immigrants to the natives of wealthy recipient countries could reduce the flow of remittances to the poor sending countries, which would lower well-being in those countries. Wealthier persons are likely to be complements to low-skilled immigrants and would thus benefit doubly from the immigration. But for countries with extensive welfare states, where natives may pay high taxes for systems in which low paid immigrants gain, some form of redistribution of the benefits of immigration may be necessary to win support for greater immigration.

## Conclusion

People flows are large and growing but remain smaller than trade and capital flows, and thus represent a promising way to attain global economic benefits. Greater mobility of labor across borders could raise the output and economic well-being of workers in developing countries more than many other policies associated with globalization. Recipient countries would experience modest gains as well, but because immigration can be economically and culturally disruptive, countries are unlikely to favor free immigration even to the moderate extent that they favor free trade. Because the gains of immigration accrue largely to immigrants from low-income countries,

the key issue in getting citizens of advanced countries to look more favorably on immigration is to design policies that give a larger share of the benefits to receiving countries. Even with current immigration policies, aging populations and low birth rates in advanced countries coupled with huge disparities in pay around the world and increased education in developing countries are likely to lead to increased immigration in the decades ahead. People flows will become more important in globalization and should help reduce global inequality among workers around the world.

## References

- Adams, Richard H. 2003. "International Migration, Remittances and the Brain Drain: A Study of 24 Labor-Exporting Countries." World Bank Policy Research Working Paper 3069. Washington, D.C.
- Adsera, Alicia and Barry R. Chiswick. 2004. "Are There Gender and Country of Origin Differences in Immigrant Labor Market Outcomes across European Destinations?" Discussion Paper Series IZA DP No. 1432 December.
- Baldwin, R.E. and L.A. Winters, eds. Chicago: Chicago University Press for NBER, pp. 235-72.
- Beine, Michel, Frederic Docquier, and Hillel Rapoport. 2003. "Brain Drain and LDCs' Growth: Winners and Losers." July 2003 IZA Discussion Paper No. 819.
- Berry, Albert & Ronald Soligo. 1969. "Some Welfare Aspects of International Migration," *Journal of Political Economy*, Vol. 77, No. 5, September/October .
- Bhagwati, Jagdish N. 1976. *Taxing the Brain Drain*. Amsterdam: North Holland.
- Bhagwati, Jagdish N. and T. N. Srinivasan. 1983. "On the Choice between Capital and Labor Mobility," *Journal of International Economics*. May, 14: 3/4, pp. 209- 221.
- Borjas, George. 1987. "Self-selection and the Earnings of Immigrants." *American Economic Review*. September, 77:4, pp. 531-553.
- Borjas, George. 1992. "National Origin and the Skills of Immigrants in the Postwar Period" in *Immigration and the Workforce: Economic consequences for the United States and Source areas* (edited by George Borjas and Richard Freeman University of Chicago Press, pp17-47
- Borjas, George. 2003. "The Labor Demand Curve Is Downward Sloping: Reexamining the Impact of Immigration on the Labor Market." *The Quarterly Journal of Economics*. 118:4, pp.1335-1374.
- Borjas, George. 2005. "The Labor-Market Impact of High-Skill Immigration " *American Economic Review* Vol. 95, No. 2, May 2005
- Borjas, George, Richard B. Freeman, and Lawrence F. Katz. 1996. "Searching for the Effect of Immigration on the Labor Market." *AEA Papers and Proceedings* , Session: Globalization and the U.S. Labor Market. May, 86:2..
- Borjas, George, Richard B. Freeman, Lawrence F. Katz. 1997. "How Much Do Immigration and

Trade Affect Labor Market Outcomes”, *Brookings Papers on Economic Activity*. 1, pp: 1-90.

Brown, Charles. 1988. “Minimum Wage Laws: Are They Overrated?” *Journal of Economic Perspectives*. 2:3, pp.133-45.

Brucker, Herbert, et al. 2002. “Contracted Temporary Migration,” chapter 6 in *Immigration Policy and the Welfare System*. Tito Boeri, Gordon Hanson, Barry McCormick, eds. NY: Oxford University Press.

Camarota, Steve A. 2004. “A Jobless Recovery? Immigrant Gains and Native Losses,” CIS (Center for Immigration Studies) Backgrounder article (October), table 1. At <[www.cis.org/articles/2004/back1104.html](http://www.cis.org/articles/2004/back1104.html)>

Card, David. 1990. “The Impact of the Mariel Boatlift on the Miami Labor Market.” *Industrial Labor Relations Review*. January, 43:2. pp. 245-257

Card, David and Alan B. Krueger. 1997. *Myth and Measurement: The New Economics of the Minimum Wage*. Princeton, NJ: Princeton University Press.

Card, David. 2001. “Immigrant Inflows, Native Outflows, and the Local Labor Market Impacts of Higher Immigration” *Journal of Labor Economics*. 19:1, pp. 22-64.

Carrington, William J. and Pedro J.F. de Lima. 1996. “The Impact of the 1970s Repatriates from Africa on the Portuguese Labour Market.” *Industrial and Labor Relations Review*. 49, pp. 330-346.

Carrington, William J. and Enrica Detragiache. 1998. “How Big Is the Brain Drain?” IMF Working Paper 98/102, Washington, DC.

Castillo-Freeman, Alida and Richard Freeman 1992 “When the Minimum Wage Really Bites: The Effect of the U.S.-Level Minimum on Puerto Rico” in Borjas, George J. and Richard B. Freeman, editors *Immigration and the Work Force: Economic Consequences for the United States and Source*. Chicago: University of Chicago Press for NBER.

Clark, Ximena, Timothy J. Hatton, Jeffrey Williamson. 2002. “Where Do U.S. Immigrants Come From, and Why?” NBER Working Paper no.8998, June.

Collins, William J., Kevin H. O’Rourke, Jeffrey Williamson. 1997. “Were Trade and Factor Mobility Substitutes in History?” NBER Working Paper no.6059, June.

Coppel, Jonathan, Jean-Christophe Dumont, and Ignazio Visco. 2001. “Trends in Immigration and Economic Consequences, OECD Economic Department Working Paper no. 284, June ECO/WKP(2001)10.

Commander S, M. Kangasniemi and L. A. Winters. 2004. ‘The Brain Drain: Curse or Boon? A Survey of the Literature’, Chapter 7 in *Challenges to Globalization: Analyzing the Economics*.

Deardorff, A., 2000. "Factor Prices and the Factor Content of Trade Revisited: What is the Use?," *Journal of International Economics* 50(1), February.

Davis, Donald R. and David E. Weinstein. 2002. “Technological Superiority and the Losses from Migration.” NBER WP no. 8971, May.

Desai, Mihir A., Devesh Kapur and John McHale. 2001. “The Fiscal Impact of the Brain Drain: Indian Emigration to the U.S.” Prepared for the Third Annual NBER-NCAER Conference, December 17-18, 2001. Harvard University and National Bureau for Economic Research.

Dobson, Janet, Gail McLaughlan and John Salt. 2001. “International Migration and the United Kingdom: Recent Patterns and Trends.” UK Home Office, RDS (Research Development Statistics) Occasional Paper 75, December. at  
[<http://www.homeoffice.gov.uk/rds/pdfs/occ75.pdf>](http://www.homeoffice.gov.uk/rds/pdfs/occ75.pdf)

Dustman, Christian and Ian Preston. 2004. “Is Immigration Good or Bad for the Economy? Analysis of Attitudinal Responses.” Centre for Research and Analysis of Migration (CreAM), University College London, CreAM Discussion Paper Series no 06/04, December. At  
<http://www.econ.ucl.ac.uk/cream/>

Eckstein, Zvi and Yoram Weiss. 1998. “The Absorption of Highly-Skilled Immigrants, Israel, 1990-95.” CEPR Discussion paper no.1853, March.

Filer, Randall K. 1992. “The Effect of Immigrant Arrivals on Migratory Patterns of Native Workers,” in *Immigration and the Work Force*. George Borjas and Richard Freeman, eds. Chicago: University of Chicago Press for NBER), pp 245-269.

Finn, Michael. 2003. “Stay Rates of Foreign Doctorate Recipients from US Universities, 2001, Oak Ridge, TN, Oak Ridge Institute for Science and Education.

Fraser Institute. 2001. *Economic Freedom of the World*. At <<http://www.freetheworld.com>>

Freeman, Richard B. 2005. “Does Globalization of the Scientific/Engineering Workforce Threaten US Economic Leadership?” NBER WP no. 11457, July.

Freeman, Richard B. and Remco Oostendorp. 2001. “The Occupational Wages Around the World Data File.” *International Labor Review*. November, 120:4

Freeman, Richard B. and Remco Oostendorp. 2003. Occupational Wages Around the World,

Data Files, 2003 Data at <<http://www.nber.org/oww/>>

Friedberg, Rachel M. 2001. "The Impact of Mass Migration on the Israeli Labor Market," *The Quarterly Journal of Economics*. MIT Press, 116:4, pp. 1373-1408.

Friedberg, Rachel M. and Jennifer Hunt. 1995. "The Impact of Immigrants on Host Country Wages, Employment and Growth." *Journal of Economic Perspectives*. American Economic Association, 9:2, pp. 23-44.

Glover, Stephen, Ceri Gott , Anaïs Loizillon, Jonathan Portes, Richard Price, Sarah Spencer, Vasanthi Srinivasan and Carole Willis.. 2001. "Migration: An Economic and Social Analysis" UK Home Office, RDS (Research Development Statistics) Occasional Paper 67. at <[http://www.homeoffice.gov.uk/rds/pdfs/occ67\\_migration.pdf](http://www.homeoffice.gov.uk/rds/pdfs/occ67_migration.pdf)>

Grieco, Elizabeth and Brian Ray. 2004. "Mexican Immigrants in the US Labor Force" March 1, Migration Information Source. At <<http://www.migrationinformation.org/USFocus/display.cfm?ID=206>>

Gierking, Shelby and John Mutti. 1983. "Factor Rewards and the International Migration of Unskilled Labor : A Model with Capital Mobility." *Journal of International Economics*, May, 14:3-4, pp. 367-380.

Hail, Luzi and Christian Leuz. 2004. "International Differences in the Cost of Equity Capital: Do Legal Institutions and Securities Regulation Matter?" University of Pennsylvania, December. At <[http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=641981](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=641981)>

Hanson, Gordon. 2005. "Emigration, Labor Supply, and Earnings in Mexico" NBER Working Paper 11412

Hatton, Timothy J. and Jeffrey Williamson. 1998. *The Age of Mass Migration. Causes and Economic Impact.* Oxford: Oxford University Press.

Hatton, Timothy J. and Jeffrey Williamson. 2002. "What Fundamentals Drive World Migration?" NBER Working Paper no.9159, September.

Hendricks, Lutz. 2002. "How Important is Human Capital for Development? Evidence From Immigrant Earnings." *American Economic Review*. March, 92:1, pp. 198-219.

Hunt, Jennifer. 1992. "The Impact of the 1962 Repatriates from Algeria on the French Labor Market". *Industrial and Labor Relations Review*. April, 45:3, pp. 556-72.

Ibarraran, Pablo and Darren Lubotsky, 2005. "Mexican Immigration and Self-Selection: New evidence from the 2000 Mexican Census", NBER Working Paper no. 11456, July.

International Organization for Migration (IOM). 2005a *World Migration 2005: Costs and Benefits of International Migration*. No. 882 - 22 June. At  
<http://www.iom.int/iomwebsite/Publication/ServletSearchPublication?event=detail&id=4171#>

International Organization of Migration, 2005b Facts and Figures,  
[http://www.iom.int/en/PDF\\_Files/wmr2005\\_presskit/wmr\\_facts\\_and\\_figures/WMR\\_Facts\\_and\\_Figures.pdf](http://www.iom.int/en/PDF_Files/wmr2005_presskit/wmr_facts_and_figures/WMR_Facts_and_Figures.pdf)

International Social Science Programme (ISSP). 1995. *National Identity I*, ZA No. 2880. University of Cologne, Central Archive for Empirical Social Research. Available at German Social Science Infrastructure Services  
[<http://www.gesis.org/en/data\\_service/issp/data/1995\\_National\\_Identity.htm>](http://www.gesis.org/en/data_service/issp/data/1995_National_Identity.htm)

Kahn, Lawrence M. 2004. "Immigration, Skills, and the Labor Market: international evidence" *Journal of Population Economics* 17, pp 501-534.

Kamemera, David., Victor I. Onguledo, and Bobby Davis. 2000. "A Gravity Model Analysis of International Migration to North America." *Applied Economics*. 32:13, pp. 1745—55.

Kapur, Devesh and John McHale. 2004. *Sharing the Spoils: International Human Capital Flows and Developing Countries*. Mimeo, The Center for Global Development, Washington, DC

Krugman, Paul, 2000. "Technology, Trade and factor Prices," *Journal of International Economics*. February, 50:1, pp. 51-71.

Leamer, Edward E. and James A. Levinsohn. 1995. "International Trade Theory: The Evidence" In *The Handbook of International Economics*, Vol III, G. Grossman and K. Rogoff, eds. Amsterdam: Elsevier Science.

Leamer, Edward. 2000. "What's the Use of Factor Contents." *Journal of International*

*Economics.* 50:1, pp. 17-49.

Lowell, B. Lindsay, Allan Findlay and Emma Stewart. 2004. Working Paper Seminar, "Brain Strain: Optimising Highly Skilled Migration from Developing Countries." Institute for Public Policy Working Paper no.3, London.

Markusen, James R. "Factor Movements and Commodity Trade as Complements" *Journal of International Economics*, 14, 1983, 341-356

Markusen, James R. and Lars E.O. Svensson. 1985. "Trade in Goods and Factors with International Differences in Technology," *International Economic Review*, Vol. 26, 1985, pp. 175-192.

Martin, Philip. 2001. "There Is Nothing More Permanent Than Temporary Foreign Workers," CIS (Center for Immigration Studies) Backgrounder article (April). At <<http://www.cis.org/articles/2001/back501.html>>

Mayda, Anna Maria. 2005. "International Migration:A Panel Data Analysis of Economic and Non-Economic Determinants." IZA Discussion Papers no. 1590, May. At <<http://www.georgetown.edu/faculty/amm223/InternationalMigration.pdf>>

Mundell, Robert . 1957. "International Trade and Factor Mobility", *American Economic Review*, June, 47, pp. 321-335

National Academy of Science, COSEPUP. 2005. *Policy Implications of International Graduate Students and Postdoctoral Scholars in the United States*. National Academies Press Washington DC

National Science Board, Division of Science Resource Statistics. 2004. *Science and Engineering Indicators 2004*. May. Arlington, VA: NSF, National Science Board.

OECD, SOPEMI. 1998. *Trends in International Migration*. (Paris: OECD).

OECD, SOPEMI. 2001. *Trends in International Migration*. (Paris: OECD).

O'Rourke Kevin H. and Jeffrey G. Williamson. 1999. *Globalization and History: The Evolution of a Nineteenth-Century Atlantic Economy*. Cambridge, MA: MIT Press.

Passell, Jeffrey S. 2004. "Mexican Migration to the US: The Latest Estimates." Migration Policy Institute, March 1. At <<http://www.migrationinformation.org/Feature/display.cfm?ID=208>>

Passell, Jeffrey S. 2005. "Estimates of the Size and Characteristics of the Undocumented Population." PEW Hispanic Center Report, March 21. At

<<http://pewhispanic.org/files/reports/44.pdf>>

PEW Research Center for the People and the Press. 2003. *Pew Global Attitudes Project*. June 3. At

<[http://people\\_press.org/presentations/PewGlobalAttitudesViewsofaChangingWorld.pdf](http://people_press.org/presentations/PewGlobalAttitudesViewsofaChangingWorld.pdf)>

Ramos, Fernando. 1992. "Out-Migration and Return Migration of Puerto Ricans" in *Immigration and the Work Force: Economic Consequences for the United States and Source*. George J. Borjas and Richard B. Freeman, eds. Chicago: University of Chicago Press for NBER.

Rauch, James E. and Vitor Trinidade. 2002. "Ethnic Chinese Networks in International Trade." *Review of Economics and Statistics*. 84:1, pp.116 -130.

Rodrik, Dani. 2001. "Comments at the Conference on Immigration Policy and the Welfare State." Trieste, Italy, June 23, 2001. At  
<<http://ksghome.harvard.edu/~drodrik/Comments%20on%20Immigration%20Conference.doc>>.

Ruhs, Martin and Ha-Joon Chang. 2004. "The Ethics of Labor Immigration Policy." *International Organization* 58:1, pp. 69-102.

Ruggles, Steven, Matthew Sobek, Trent Alexander, Catherine A. Fitch, Ronald Goeken, Patricia Kelly Hall, Miriam King, and Chad Ronnander. *Integrated Public Use Microdata Series: Version 3.0* [Machine-readable database]. Minneapolis, MN: Minnesota Population Center [producer and distributor], 2004. At <<http://www.ipums.org>>.

Scheve, Kenneth F. and Matthew J. Slaughter. 2001. "Labor Market Competition and Individual Preferences Over Immigration Policy." *Review of Economics and Statistics*. February, 83:1, pp. 133-145.

Stultz, Rene, M.. 2005. "The Limits of Financial Globalization" NBER Working Paper no. 11070, January.

UNCTAD (United Nations Conference on Trade and Development). 2004. *World Investment Report 2004: The Shift Toward Services*. New York and Geneva: United Nations. At  
<[http://www.unctad.org/en/docs/wir2004annexes\\_en.pdf](http://www.unctad.org/en/docs/wir2004annexes_en.pdf)>

UN (United Nations), Department of Economic and Social Affairs. 2000. "Replacement Migration: Is It a Solution to Declining and Ageing Populations?" ESA/P/W.160. March 21. Population Division, UN Secretariat, New York, NY.

United Nations Population Division International Migration Report, 2002. E/2002/50. United Nations, NY.

<http://www.un.org/esa/population/publications/ittmig2002/2002ITTMIGTEXT22-11.pdf>

United Nations, Department of Economic and Social Affairs. 2004. *World Economic and Social Survey 2004*. Part 2, International Migration. E/2004/75/Rev.1/Add.1,

ST/ESA/291/Add1. United Nations, NY. At  
[<www.un.org/esa/policy/wess/wess2004files/part2web/preface.pdf>](http://www.un.org/esa/policy/wess/wess2004files/part2web/preface.pdf)

Unger, Kurt. 2005. "Regional Economic Development and Mexican Out-Migration" NBER Working Paper no. 11432, June.

Weiss, Yoram "High Skill Immigration; some lessons from Israel" Swedish Economic Policy Review 7 (2000), 127-155

Wickramasekera, Piyasiri. 2002. "Asian Labour Migration: Issues and Challenges in an Era of Globalization." International Labour Office. International Migration Program. Geneva.

Wong Kar-Yiu. 1983. "On Choosing Among Trade in Goods and International Capital and Labor Mobility," *Journal of International Economics*. 14, pp. 223-250

Wood, Adrian. 1994. *North-South Trade, Employment and Inequality: Changing Fortunes in a Skill-Driven World*. Oxford: Clarendon Press.

**Table 1**  
**Leading Receiving and Sending Countries for International Migrants, 2000**  
(in millions of migrants)

Major Receiving Countries	Total Immigrants (millions)
United States	35.0
Russia	13.3
Germany	7.3
Major Sending countries	Total Emigrants (millions)
China	35.0
India	20.0
Philippines	7.0

Source: United Nations (2002, Figure 1) for immigration. International Organization of Migration (2005b) for emigration.

Table 2  
Monthly Earnings in the Same Occupation, by country, 1998-2002

Occupation	# countries	Earnings in US \$ Using Exchange Rate			Earnings in US \$ Using Purchasing power Parity		
		Top 20% point in distribution	Bottom 20% point in distribution	Ratio of Top 20% to Bottom 20%	Top 20% point in distribution	Bottom 20% point in distribution	Ratio of Top 20% to Bottom 20%
Physicians	51	2856	183	15.6	3815	753	5.1
Insurance Agents	41	1668	205	8.1	2214	684	3.2
Computer Programmers	35	2114	166	12.7	2693	774	3.5
Clicker Cutter	30	1097	95	11.5	1298	304	4.3
Logger	26	1040	77	13.5	1547	215	7.2

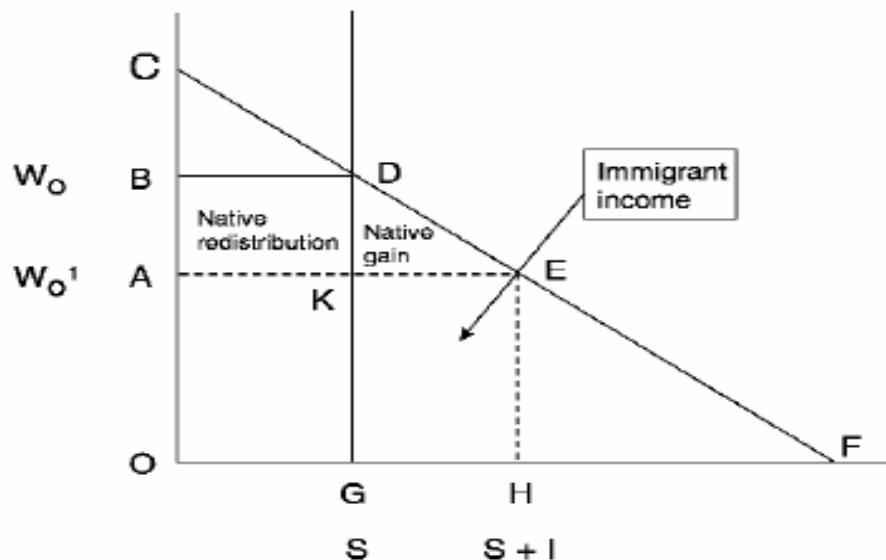
Source: Freeman and Oostendorp, Occupational Wages Around the World Data File, 2003 data, <<http://www.nber.org/oww/>>. To obtain the quintile earnings, I identified the appropriate country and gave the earnings of that country – that is, for clicker cutter, I give the earnings of the 6<sup>th</sup> highest country and 6<sup>th</sup> lowest country.

**Table 3:** Trend in Foreign-born Share of Science and Engineering Employment, by Education Group.

Group	1990	2000	2004
Bachelors	11%	17%	17%
Masters	19%	29%	32%
All Ph.D.	24%	38%	37%
Ph.D.s, age less than 45	27%	52%	-
Post-Doctoral	49%	57%	--

Source: 1990 and 2000 bachelor's, masters, Ph.D. and Ph.D.s less than 45 years of age, tabulated from Census of Population, IPUMS data; <<http://www.ipums.umn.edu>>. 2004 figures tabulated from NBER merged outgoing rotation files at <http://www.nber.org/data/morg.html>, Post-Doc, NSF, Science and Engineering Indicators, 2004, figure 2.26, where the figures refer to temporary residents rather than to foreign born.

## Figure 1: Gains & Losses from Immigration and Emigration



E 4.1 Effects of an influx of immigrants on a simple model of the labor market.

Note: The effects of immigration on natives in the receiving country are shown by the increase in supply from  $S$  to  $S+I$ . The effects of emigration on natives in the sending country are shown by the decrease in supply from  $S+I$  to  $S$ .