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### **CONSEQUENCES OF MIGRATION FOR DEVELOPING COUNTRIES\***

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#### A. INTRODUCTION

In the last 40 years, there has been a substantial expansion in global trade and capital movements across countries. At the same time, the gap between per-capita incomes in low-income and high-income countries has not closed. New approaches to eradicating global poverty are called for. One policy increasingly on the development agenda is the encouragement of international flows of people from low- to high-income economies. Clearly such migration will improve the economic circumstances of those who move. An important question is how increased international migration, and of what type, affects incomes, growth and development in underdeveloped countries.

In this paper I consider the relationship between emigration from low-income countries and the development of those countries. I do not review the enormous and growing literature on this topic. Rather I consider the analytics of the question and use data from two new surveys of U.S. immigrants combined with cross-country data to shed light on some of the issues and some of the major literature, in addition to data on the households with immigrants from one sending country, India. One of the reasons that the effects of immigration on both sending and receiving countries are uncertain is that the quality and quantity of data describing immigrants and their families is relatively poor. The first US data set I use is the adult sample portion of the New Immigrant Survey (NIS), based on a 4 percent sample of all persons 18 and over who were admitted as permanent resident aliens in the 7-month period May through November of 2003. The survey oversampled principal-applicant employment and diversity-visa immigrants. Total sample size for adult immigrants is 8,575. Details of the survey are given in (Jasso et al. (2004)) The second data set describing immigrants is the New Immigrant Survey Pilot (NISP). The sampling frame for the NISP consists of the 148,987 persons who were admitted to legal permanent residence during the months of July and August of 1996. The stratified random design over-sampled migrants with employment visas. Sample size for adult immigrants is 1032. Details of the survey are given in (Jasso et al. (2000)). Information on probability samples of US immigrants can illuminate a number of issues on the impact of immigration on sending countries, and the United States is by far the largest recipient of international migrants.

In part B of the paper, I describe the simple analytics of migration to show the direct mechanisms by which changing flows of immigrants of different skills affect incomes, prices and skill investments in sending countries. The empirical literature related to these effects are assessed in the light of the framework. The next section discusses an additional route by which sending countries can benefit from increased out-migration - return migration. New data sets purporting to measure the outflow of skilled migrants from low-income countries are examined in the light of information on immigrants from the US surveys and are shown to substantially overstate the brain drain from low-income countries because of the inability to account for the acquisition of schooling by both receiving-country and sending-country residents born in sending countries who receive their schooling in receiving countries. Section D considers international transfers, and considers three issues: what determines the magnitudes of transfers? Who receives the transfers? and, finally, what is the impact of transfers on development? The new household survey from India is used to distinguish the effects on transfers of temporary and permanent migration and to show that transfers from international migrants in India are regressive, going to the highest-income households. Evidence is also reviewed on the impact of transfers, and a significant shortcoming of the literature is discussed. Section D is followed by a brief conclusion.

#### B. A SIMPLE CONCEPTUAL FRAMEWORK

#### 1. Skill prices, skills and the incentives to migrate

This section provides a unified framework for considering the determinants and consequences of emigration from low-income sending countries. The simple framework ignores two effects on sending countries associated with out-migration - return migration and remittances. These are considered in following sections. In assessing the relationship between out-migration from low-income countries and their economic development it is useful to distinguish between two proximate factors that determine the income of a worker *i* located in country *j* - the skill level of the worker  $x_i$  and the amount each unit of skill is valued in the economy in which the worker is located, or the skill price  $\omega_j$ . The worker's wage  $W_{ij}$  in home country *j* is thus

(1) 
$$W_{ij} = \omega_j x_i.$$

Variation in the average wages of workers across countries is due to inter-country differences in both average skill levels and differences in the skill prices. Increasing incomes thus entails increasing either the price paid for skills or skill levels. These simple concepts mask a lot of complexity - skill price variation across countries will depend on a large number of factors - on natural endowments (geography), on the level of technology and the amount of capital, or on a deeper level on the quality of institutions. The level of skill also depends on complex factors, for example, on access to schools, but also on the level of the skill price itself, which affects the return to investing in skills. And, of course, the aggregate amount of skill in the economy affects the equilibrium skill price as well. Development economists are concerned with country-specific policies that affect skill prices and skill levels. But out-migration also affects these factors and is in turn affected by them.

Equation (1) also highlights the choice faced by an individual located in an economy who seeks to raise his/her income - skills can be upgraded or the worker can transport his skill from j to an economy where the skill price is higher. If the skill price is low, investments in skills while remaining in the economy have a small payoff; on the other hand in that setting moving to another economy with a high skill price has a large payoff. Skill price differences thus are the driving force for international migration, not average wage differences across countries. Average country-specific wages differ both because average skill levels and skill prices differ, but workers of given skill considering migration only care about the latter.

Are differences in average incomes per-worker or per person across countries a reasonable proxy for skill price differences? One measure of the skill price differential between two countries is the gain in earnings for a worker of given skill who migrates between them. The NISP provides information for new immigrants on the earnings in their current job in the United States and in their last job in their home country, from which the (time-worked standardized) earnings gain from switching locations, but not changing skill, can be computed. Figure I displays the difference between the purchasing-parity adjusted per-capita GDP and per-worker GDP for Mexico and the United States and the mean annualized earnings gain of legal immigrants from Mexico to the United States from the NISP for 1996. As can be seen, while the (first-year) earnings gain is high - approximately \$10,000 - the US-Mexico difference in either per-capita or per-worker GDP is 2.5X to 4X higher. The reason is, of course, that average skill levels in Mexico are considerable lower than in the United States (7 versus 14 years). The earnings gain, suggests, however, that the US-Mexico skill price gap is substantial, and the estimate likely understates the gap because it is based on the initial earnings of the immigrant and is no doubt lower due to poor English language skill (approximately 69 percent reported not being able to speaking English at all or spoke it "not well").

It would be possible to compute skill prices across countries by comparing purchasing-power adjusted wages for workers of the same skill located in different countries. Jasso and Rosenzweig (2005) use the preimmigration wages of workers from 65 countries who immigrated to the United States, based on the NISP, to estimate the determinants of skill prices across countries and thus to predict skill prices for 108 countries. The methodology takes into account that immigrants from a country are not randomly selected from sending country populations, an implication of the framework. The estimates indicate that skill price differences across receiving and sending countries are substantial. Table 1 provides the estimated skill prices for the top ten sending countries for the United States among immigrants who marry US citizens (the largest visa category of US immigrants) from that study. The estimated skill price for the United States is \$75 and, as the table shows, \$81 for Canada. However, in Mexico, the other US border country, the skill price is 25 percent below that of the US. And the skill prices for Peru and Philippines are about 1/3 the US skill price; while that for India is only 16 percent of the US skill price. These estimates indicate that a large component of worldwide inequality is due to differences in skill prices also create incentives to migrate. The estimated skill prices were also used to show that the greater the skill price difference across a country and the United States or Australia, given distance and income level, the higher the rate of immigration to those receiving countries and the lower the average skill level of the immigrants, consistent with a framework embodying (1) and in which potential migrants of different skill levels are seeking to maximize their own welfare.

#### 2. The effects of out-migration on skill prices and skills

#### a. Short-run effects

Emigration from a country affects its aggregate income by affecting the skill price and the level of skill. There are a number of mechanisms. First, there is a general-equilibrium effect on the skill price: a reduction in the population because of out-migration makes labor more scarce and thus raises the skill price. The more skilled are the out-migrants the greater the amount of aggregate skill reduction and thus the larger the upward effect on the skill price. This effect is quantified in the world-wide general-equilibrium model of Hamilton and Whalley (1984), Walmsley *et al.* (2003) and Winters *et al.* (2003). However, in these exercises cross-country wages are used rather than skill prices so it is difficult to gage their results. Nevertheless, they show both the enormous worldwide efficiency gains from moving persons from low to high skill price (wages) in sending countries from increased international migration are significant. This analysis, like those in the general-equilibrium model literature, assume that capital flows do not change as a result of increased immigration. This is not likely, and more analysis is needed that incorporates both international capital and labor mobility. Clearly, however, international capital mobility (and commodity trade) has not eliminated factor price differences (skill prices).

The second effect of migration on average wages is the compositional effect: If out-migrants had the same average skill as the country as a whole average skill levels of remaining residents would be unchanged compared with the state prior to migration. Out-migration would the raise average wages in the home country the skill price would increase and average skill would remain the same. If out-migrants are more skilled than average in the home country, then average wages could decline. However, all remaining residents still benefit from the rise in the skill price. The average wage effect of out-migration can thus be a misleading indicator of home-country welfare effects of migration due to compositional effects. Similarly, changes in wages in home and receiving countries from migration can be a misleading indicator of the changes in incentive effects for migration. Borjas (2002) emphasizes the compositional effect of skilled migration, and overlooks the generalequilibrium effect that must reduce subsequent migration flows in discussing the effects of creating greater opportunities in the United States for skilled migrants "Such a drain of human capital would further widen the income gap between the United States and the rest of the world, creating more incentives for migration to this country...". The first part of the statement is correct - skilled migration lowers the average skill level in sending countries and raises it in receiving countries (the compositional effect). But skill migration also reduces the skill price gap, lowering the skill price in the receiving country and raising it in the sending country, as shown in the general-equilibrium models. This will decrease, not increase incentives for migration.

#### b. Long-run effects

The general-equilibrium and compositional effects of emigration on the home country wage discussed assume that skill levels of residents remain constant. But the general-equilibrium rise in the skill price induced by the decrease in the quantity of skill in the economy increases the return to augmenting skills and thus will induce a rise in skill levels. Because the higher the level of the skill of the out-migrants the greater the rise in the skill price, more skilled out-migration will have a bigger effect on skill upgrading than less skilled out-migration. This long-run effect on incentives to invest in skills is ignored in the general-equilibrium models computing the consequences of migration.

There is not a large literature documenting the responsiveness of educational investments to changes in returns to skills in low-income countries. In part this is due to data limitations, and also due to the fact that in many low-income countries returns to skills or schooling have not changed. There is some evidence that households do respond to changing skill returns, however. Foster and Rosenzweig (1995) have shown that school enrollment rates in Indian farm households, for given wealth change, rose significantly where green-revolution induced increases in the returns to schooling in farming increased. Munshi and Rosenzweig (2004) present evidence that in Mumbai, where returns to English language skills increased enormously in the decade of the 1990's, enrollments shifted substantially from cheaper local-language schools to more expensive schools in which the medium of instruction is English. Clearly, the effect on skill investment of changes in returns to skill in other contexts will also depend on supply-side factors, such as access to schools, school quality, etc. And indeed, in settings in which out-migration is induced in part by poor quality schools, the responsiveness of skill investments to increased out-migration among residents may be small.

A recent literature (e.g., Beine *et al.* (2003)) considers an additional effect on skill investments arising from changes in the prospects of out-migration. The basic framework assumes that residents of a country face an exogenous probability *p* of being able to migrate to a higher skill price country. The skill price relevant to the skill investment decision is then not just the home country skill price  $\omega_j$  but the <u>expected</u> skill price given by  $(1 - p)\omega_j + p\omega_k$ , where  $\omega_k$  is the skill price in the potential destination country. Increasing prospects for emigration (to a higher skill price setting) thus has a direct effect on incentives to invest in skills in sending countries. Moreover, investments in skills in sending countries would directly respond to changes in the skill prices of destination countries. Note that distinguishing between the general-equilibrium effect of increased actual emigration on incentives to invest in skills (ignored in these models) from the effects induced by increased prospects for out-migration is difficult, particularly as residents anticipate the general-equilibrium effects of this model, however, is that as long as immigration by receiving countries is rationed, there will be overinvestment in schooling in sending countries. If there are other factors leading to under-investment, however, this migration prospect effect may offset them.

#### C. THE NET LOSS OF HUMAN CAPITAL IN SENDING COUNTRIES

#### 1. The emigration and return of skilled permanent immigrants

The previous section discussed the effect on sending-country incentives to invest in skills associated with the general-equilibrium and migration prospect effects of increases in permanent flows of migrants into high skill-price countries. This section examines the direct and indirect effects of the migration of human capital, some of which is not considered in the simple framework. A country that loses individuals with high skill experiences a loss, as noted, in the contributions to output of the worker and a decline in average per-worker income. And to the extent that the schooling was financed from public funds, such educational investments are subsidies of the countries to which the skilled migrants immigrate. This loss is the focus of the "brain drain" literature. However, this literature ignores the return of skilled immigrants. Another potentially important mechanism by which increasing opportunities for high-skill individuals to immigrate permanently to high skill-price countries positively affects the home country's growth is via the return of the migrants back to the home country. Such immigrants may bring back to the home country increased skills and knowledge that could only be picked up abroad but are transferable to the home environment (Stark *et al.* (1997); Domingues Dos Santos and Vinay (2003)). Although the return of low-skill migrants who work temporarily in low-skill jobs in a developed country for a short period of time could also have beneficial effects in the home country, it is more likely that it will be high-skill individuals working in dynamic sectors of the economy that will contribute, upon return, to the development of the home country.

The empirical issues concern the magnitudes and impacts of return migration by skilled immigrants who have acquired significant skills in the receiving country. With respect to the latter question, there is little systematic evidence, although there is some intriguing case studies (e.g., Saxenian (2002). There is also only limited information on the quantitative importance of return migration. How important is return migration by skilled or other immigrants who are not required by the terms of their visas to return home? Existing estimates indicate that return migration from the United States is not trivial. Jasso and Rosenzweig (1982) combined INS administrative records at entry for the FY 1971 cohort of legal permanent immigrants with their subsequent naturalization and address report records to estimate 10-year emigration rates. These averaged 30 percent, but were as high as 50 percent for immigrants in the cohort from some sending countries. The administrative records kept by governments in receiving countries do not permit, however, an assessment of the magnitude of return migration by education. Cohort analyses using immigration date-of-entry cohorts across adjacent Censuses have been used to estimate emigration rates from receiving countries of the foreign born, but not by schooling. The official US Bureaus of the Census estimate of the ratio of emigration to immigration for the 1981-90 period is .22 - 22 percent of immigrants leave. However, estimates based on Census data cannot distinguish between immigrants with temporary or permanent visas. The official estimates do not distinguish emigration by skill level or country of origin.

The first round of the NIS sheds some light on the prospects of return migration for immigrants with visas not limiting duration of stay. The "new" permanent residents were asked within a few months of receiving their permanent visas whether they intended to spend the rest of their lives in the United States. It is thus possible to see what proportion of the immigrants thought they would emigrate by schooling level. Figure II shows the proportions who said they were not going to stay for four education categories - less than a high-school education, high school graduate, college graduate and graduate training. As can be seen, there is a monotonic relationship between the likelihood of emigration and schooling attainment, with the probability of not staying 15 percent for those with college degrees and higher. Intentions and behavior are not necessarily the same, and we will have to wait for subsequent rounds of the NIS, which will track the location of all respondents, to see how temporary permanent immigrants with high skill are in this cohort.

#### 2. Student immigrants and their return

There is another source of return migrants among skilled immigrants to high-income countries. Many individuals come to developed countries for the purpose of acquiring schooling. In 2004, for example, the United States granted 620,210 student visas. In George Borjas' critique of the US student visa program (Borjas (2002)), one of his criticisms is that "The program is best viewed as yet another redistribution program, taking wealth away from native workers and taxpayers and redistributing it to universities and foreigners." Borjas is correct - to the extent that schooling is publicly subsidized in receiving countries and foreign students do not remain in the receiving country, there is an important subsidy from receiving-country taxpayers going to immigrant sending countries. This subsidy element embodied in returning students is often ignored when assessing the contribution of developed country assistance to developing countries.

What proportion of foreign students who receive schooling in receiving countries return? Borjas looks at those US immigrants who adjusted their visa status from a student visa, and calculated that 13 percent of foreign students went on to become US permanent resident aliens. This of course means that 87 percent of foreign-born students receiving schooling in the US returned home (or went to other countries). However, this method of estimating the return rate of US-schooled foreign-born overstates the return rate. The NIS shows that many immigrants who had gone to school in the US prior to becoming permanent residents aliens did not adjust from a student visa. Many former US student visa holders transition to another temporary visa or become illegal by overstaying before becoming permanent resident aliens. Indeed, the NIS data indicate that only 8.2 percent of the new immigrants who obtained US schooling adjusted their status from a student visa, and that in fact 19.2 percent of the immigrants were the ones most likely to have obtained US schooling - 20.2 percent of the immigrants with at least a college degree obtained some schooling in the US, compared with only 7.6 percent for those without a college degree. A substantial portion of skilled foreign-born residing in the US.

#### 3. Estimating the magnitudes of the Abrain drain $\cong$

Return migration by "permanent" immigrants is often ignored in empirical work because of the lack of information on the magnitudes of return flows of either permanent immigrants or students. Recently, researchers have with support from the World Bank issued a set of estimates of emigration rates by country of the highly-skilled (Docquier and Marfouk (2004). Similar data have been used by Beine et al (2003) to estimate the impact of skilled emigration. The estimates in this new data set overstate substantially the <u>net</u> emigration of persons who acquired higher levels of schooling in their home country, which is the relevant construct, in part because they ignore both the acquisition of schooling abroad by persons resident in sending countries and return migration.

The methodology used by Docquier and Marfouk (DM) estimates the gross emigration rate for those born in country i with schooling level j as the ratio of (a) the sum of the stocks of foreign-born born in i who are above age 25 and in schooling group j across a large number of receiving countries to (b) the stock j still residing in i in the same age group. This methodology yields for estimates for the year 2000 such that over 82 percent of those with tertiary education in Jamaica are residing outside Jamaica and that almost 43 percent of tertiary-educated Ghanaians left the country. However, there are two problems with these estimates, which inflate the figures substantially, and which arise because of the inability to assess how much of the schooling by the host-country foreign-born was acquired in the host country and how many of the home-country residents obtained their schooling in the host country.

The first problem, recognized by DM, is that some of the foreign-born immigrate as children and thus likely received their schooling in the receiving country. DM believe this number to be small. However, the immigration statistics for the United States from BCIS indicate (for FY 2003) that over 18 percent of permanent resident aliens immigrate before they are 18 years of age and over 25 percent immigrate before they are 20. Such immigrants are unlikely to have received higher levels of schooling in their home country. Data from the public use data sets issued by the US Immigration and Naturalization Service (INS) indicate, moreover, that the proportion of such young immigrants varies considerably across countries. For example, in 1998 just over 10 percent of immigrants to the United States from The Gambia (with an emigration rate estimated to be 64.7 percent by DM) were under age 20; in Jamaica the corresponding proportion was 38 percent. Thus, ignoring child immigration results not only in an upward bias in skilled emigration rates but also in spurious variation in the rates across countries. Illegal immigrants, who are not represented in the BCIS statistics or in the NIS, are less likely to first come as children, but these immigrants are also not likely a large proportion of the skilled immigrants that are in the numerators of the DM estimates.

The Census-based data used by DM cannot be used to correct for child immigration. The reason is that information on "entry" year, which could be used to calculate entry age, is based on answers to an ambiguous question - in the US Census the question is "When did you first come to stay?" Immigrants might answer this question by providing the date when they received a permanent immigrant visa, not the date when they first came to the US, at which time they might not have intended to or been able to stay. In other surveys, which do not elicit comprehensive migration histories, age at first entry might not signal anything about schooling location. The NIS obtained information about schooling acquired in the United States, including when that schooling was initiated and the number of years of schooling. The NIS data indicate that among those individuals who become permanent immigrants after age 24, many had received schooling in the US prior to "immigrating": over 25 percent of the new immigrants age 25 and over when they became permanent immigrants and who had 16 or more years of schooling at that time had received prior schooling in the US. So in the stock of (permanent) immigrants we have those who became permanent resident aliens before they were 20, for whom most of their advanced schooling was likely in the receiving country, and those who became permanent after age 20 but who still obtained their schooling outside the home country.

Correcting the numerators of the DM estimates by eliminating those who likely received their schooling outside the sending country substantially affects both the magnitudes of the brain drain estimates and the ranking of the magnitudes across countries. Figure III reports three measures of gross brain drain rates (ignoring return migration) for six island sending countries - Jamaica, Haiti, Trinidad and Tobago, Grenada, Barbados and St. Vincent. These countries are all in the top 25 of (gross) brain drain countries based on the DM estimates (Table 3 of DM). Most of the emigrants from these countries are likely in the United States, so that US-based immigration data can be used to assess the biases in the DM estimates. The first columnar bar for each country in figure III is the DM estimate of the emigrants who came before they were 20 years of age are eliminated, based on the country-specific age distributions in the FY 1998 US immigration cohort. As can be seen, the estimated rates drop considerably for every country, from 82 percent to just over 50 percent for Jamaica, for example. And the age-at-entry-adjusted rates change the ranking of countries as well, with Haiti and Trinidad and Tobago having the highest rates rather than Jamaica once immigrants who came too young to be educated at home are eliminated.

The third column for each sending country is the gross emigration rate eliminating those immigrants who became permanent resident aliens after age 20 but who, according to the NIS, also received their schooling in the United States. This further reduces the estimated rates of emigration for those who received their higher-level schooling in the sending country. The most dramatic effect of the corrections is for St. Vincent, for which the gross rate goes from (uncorrected) 55 percent to about 12 percent. The rates corrected for schooling location are approximately half of those reported by DM across the countries. Figure IV reports results from the same procedures carried out for three top African brain drain countries - The Gambia, Ghana and Sierra Leone - that are also well-represented in the NIS. Again, the corrections for schooling acquired in the US reduce the rates by almost 50 percent - the rate for Ghana, for example, goes from the DM rate of 64 percent to 31 percent. These "corrected" estimates of gross emigration rates, of course, themselves have error - the stocks are corrected using flow figures for particular cohorts, which may differ from the many cohorts represented in the population. It is possible also to carry out a more refined analysis, making use of the degree history in the NIS to more accurately identify those who received their tertiary schooling in the United States.

The corrected DM rates still overstate net emigration, because they ignore those who received their schooling in the receiving country and who returned. Some of those home-country residents in the denominator of the DM measure received their schooling outside the home country. It would be useful to know for a cohort of students in a receiving country how many eventually return home, and what their contribution to the home country is of their increased schooling. Currently there is not even cohort panel data allowing estimates of return rates. Flow measures of return migration rates for those who obtained US student visas can be computed

for the first time using both BCIS data on student visas by country and NIS data on immigrants who obtained their schooling in the US. In particular, we can construct the ratio by country of the number of immigrants in a year who received their schooling in the US to the number of student visas in the year. If rates of conversion are stable across cohorts, this can be used to calculate by country the proportion of students who return home with their US provided schooling credentials.

Figure V provides for each of the six island countries with high emigration skill rates the flow return rates of students along with, for comparison purposes, the corrected rate of gross out-migration, from figure III. As can be seen, for four of the six countries - Jamaica, Trinidad and Tobago, Grenada and Barbados - more than 70% of those receiving US schooling return; for Haiti, however, few go back (the exact estimate is slightly below zero) and for St. Vincent only 14 percent return. Interestingly, for that country the emigration rate is almost the same as the return rate for students educated abroad. To correct the gross emigration rates for these return flows of educated persons requires information on the gross numbers of foreign-born in the developed countries as well as the number of return flows for each sending country. The former is not available to me. The numbers of US-trained students who return annually, based on the visa and immigration data are not trivial for Jamaica, the data suggest that about 4300 return each year.

Finally, figure VI reports the same rates for the three African sending countries. It is interesting that return rates are lower than they are for the island economies proximate to the United States - overall, less than half of students return. Nevertheless, these returning students represent a human capital investment for these countries that is substantially subsidized by the richer receiving country. And these return rates need to be accounted for in measuring net flows of human capital. Until these country-specific brain drain measures take adequate account of the location of schooling for both emigrants and home-country residents, however, empirical analyses making use of cross-country data to study the effects of emigration on sending countries (i.e., Beine *et al.* (2003)) should be interpreted with caution.

#### D. REMITTANCES FROM INTERNATIONAL MIGRANTS

#### 1. The magnitudes and determinants of transfers

When an immigrant of given skill moves from a low to a high skill-price area, total world output increases. A large portion of the gain accrues to the immigrant and those family members migrating with him/her. One important mechanism by which these private gains are shared with the sending country is via remittances - monies remitted back to the home country. Estimates of such flows suggest that they are substantial. For example, in 2000 it is estimated that aggregate transfers from the United States, at 18-19 billion \$, were almost twice that of official foreign US assistance for development (USAID (2002). Transfers from immigrants are distinctly different from governmental development aid in two major ways. First, the recipients are private households, not government agencies. Thus there is no deadweight loss associated with corruption. Second, however, remittances are not targeted to initiatives designed to spur development or to projects that have high social returns, rather they can be used by recipients to maximize their own private welfare, which may or may not contribute to sustainable economic growth There are three key questions about transfers from immigrants: 1. What are the magnitudes and determinants of the transfers - who sends them?, 2. who receives the transfers?, and 3. how do the transfers affect the economic development of the sending countries?

There is a large literature that addresses the question of the magnitudes of remittances using aggregate information on cross-country capital flows and trade. An alternative methodology is to obtain information on remittances from either surveys of immigrants or of recipient households. The NISP and the NIS provide information on the amounts of monies remitted to relatives living outside the United States by the new US legal immigrants. Table 2 provides the average level of transfers by schooling for a subset of the immigrants in

the year preceding the third round of the NISP survey, when the immigrants had been in the United States an average of three years. The two groups are those marrying US citizens and those who obtained employment visas. These two visa groups are selected because they are more likely to have family members still residing in their home country, unlike those who immigrated because they were sponsored by parents, adult children or siblings. The table also provides the share of the transfers in the immigrant's US earnings that year and the share the transfers represent of the immigrant's earnings prior to immigrating.

The figures in table 2 indicate that transfers are a small proportion of the US earnings of the immigrants - on average only 4.2 percent of those earnings are shared with home-country relatives. On the other hand, transfers represent almost 9 percent of home-country earnings, which may better reflect their impact in the sending country. The table also suggests that more schooled immigrants, who have higher US earnings, transfer greater amounts of money back to their relatives living in their home country - the average amount of transfers among college graduates and above is more than three times that of immigrants with less than a high-school degree or equivalent. Transfers decline as a share of US earnings for schooling above 12 years, however. Indeed, high school graduates have the highest transfer rates and their transfers have the biggest impact as measured by their share of home-country earnings.

The information on the transfer behavior of immigrants in the NISP is limited in two important ways. First, the NISP provides information on permanent immigrants, as noted. Such immigrants can and do bring their immediate family with them, so it is likely that remittances from permanent migrants are lower than those for temporary migrants, many of whom are not permitted to bring family members. Indeed, among the US employment immigrants in the NISP, almost 80 percent were married at the time they received their permanent residence visa. A second limitation is that there is incomplete information on the immigrants' family in the home country. Remittance flows will not only depend on the number of immediate and other relatives of the immigrant remaining in the home country, but also on their economic status. One reason that the magnitudes of transfers increase are only slightly higher among the immigrants with schooling above high school compared to high school graduates is that their relatives in the home country may be less needy. Information on recipient households can be obtained from surveys of sending country populations. The problem is that the proportion of households receiving transfers is relatively small so that either large surveys are needed or surveys designed to over-sample such households.

Devesh Kapur and Mark Rosenzweig added a supplementary questionnaire on international transfers and a supplementary sample to the 2005 (Hansa Research Group) Indian Readership Survey (HRG/IRS), a comprehensive survey of a stratified random sample of 229,738 households located in 22 states of India (Kapur and Rosenzweig (2005)). Information was obtained on the location and education of and remittances received from any immediate relatives living abroad. There are in the final sample, including the over-sampling of households by socioeconomic strata to maximize remittance-receiving households, 7,593 households with immediate relatives abroad, including 2,429 households with an immediate relative in the United States.

The household respondents who had immediate relatives outside of India were asked about whether they expected the emigrants to return, so it is possible to compare remittances received from emigrants who were temporary or permanent. The first two bars in figure VI provide the average amount of remittances received in the year prior to the survey by households with a relative in the United States for less than 11 years according to whether the emigrants were considered by the households to likely or very likely return (as opposed to likely or very likely not to return). As can be seen, average remittances are substantially higher for the temporary migrants compared with the permanent migrants - 6500 rupees for the migrants who were expected to return and only 1500 rupees from migrants not expected to return. This difference could be misleading, however, if households in which the head had obtained at least some tertiary level schooling were half as likely to expect the migrant to return compared with heads with less schooling. To control for the effects of household

characteristics, differences across temporary and permanent migrant remittances were estimated controlling for the socioeconomic status of the potential receiving households based on a 12-scale index combining occupation and schooling information. The differences, corrected for the influence of household socioeconomic status, are reflected in the rightmost two bars in figure VI. The difference in the level of remittances between temporary and permanent migrants shrinks, as expected, suggesting the role of recipient household characteristics in transfer behavior, but the temporary-migrant transfers are still more than double those of the permanent migrants.

The difference in the magnitudes of the remittances between temporary and permanent migrants must be interpreted with caution. Households with temporary migrants will only receive the remittances over a restricted time period, while households who have relatives abroad who will never return have a permanent source of assistance. The HRG/IRS data indicate that migrants who have been away for more than 10 years still provide significant transfers to the home-country households, although transfers decline with years abroad - average transfers from permanent Indian migrants away in the United States for more than 10 years are about 70 percent of those from comparable migrants away less than 10 years. Of course, the immigrants who return may bring with them new skills and international social cpaital that will also bring benefits to their home households, as discussed above.

#### 2. Who are the recipients of transfers within sending countries?

International transfers that flow from developed, immigrant-receiving countries to low-income sending countries contribute in the aggregate to reducing global poverty and inequality. But the role of such transfers in affecting the distribution of incomes with recipient countries is less studied. Do such transfers go to the poorest of the poor? Which households send immigrants abroad? Countries are likely to differ substantially in terms of the characteristics of source households for out-migrants, so that no general conclusion can be drawn from one country's experience. Nevertheless it is useful to look at one major country benefitting from transfers and international migration India, given the paucity of reliable information on the domestic incidence of transfers.

The 2005 HRG/IRS survey provides very precise information on who the immediate beneficiaries of international remittances are for India. The data indicate first that only a very small proportion of Indian households directly benefit from international migration - only 1.83 percent of households have an immediate relative residing outside of India, and only 0.77 percent receive remittances. Moreover, the data clearly indicate that in India transfers associated with international migration favors the elite. Figure VII reports the proportions of households with an immediate family member living abroad and receiving remittances stratified into two socioeconomic groups - (i) those in which the head was either a senior or middle-level executive with some tertiary education or a more junior executive with an advanced degree beyond college and (ii) all other households. The top group so defined represents less than 3 percent of Indian households. But 8.7 percent of such households have at least one immediate relative living abroad. This compares with only 1.6 percent of households among the rest of Indian households. The distribution of transfers is somewhat more egalitarian, but transfers are still 2.4X more likely to be received in the top 3 percent of households ranked by socioeconomic status (1.67 percent) than in all other households (0.74 percent).

It must be kept in mind that households in the top of the Indian distribution of income would rank in the bottom half or lower of the household distribution of income in high-income countries, precisely because, as seen in table 1, the rewards for skill are so low in India compared with high-income countries. So the Indian survey data indicate that global inequality even measured at the household level is reduced by the increased flow of international transfers despite that fact that most of the direct benefits accrue to the elite households within India.

#### 3. Assessing the impact of remittances

From the perspective that the main contribution of international transfers is to redistribute global income, then knowledge of their incidence is sufficient to evaluate their impact. A more difficult question is how transfers associated with international migration contribute to economic development. One view is that a transfer dollar or peso or rupee is no different from monies that come from any other source of income. To the extent that under-developed credit and insurance markets constrain investments, then the increases in incomes associated with remittances from migrants can help foster growth. The development literature suggests that in some contexts lack of income is a major barrier to sustainable investment (e.g., Rosenzweig and Wolpin (1990). However, even in a setting in which the relaxation of income constraints enables investments, for transfer income to spur growth there also has to be both unexploited profitable opportunities and an environment in which investment returns are protected. Just as the effects of governmental foreign aid are blunted due to lack of institutions that foster investment and innovation, so too will the effects of increases in private transfers. Thus, the effects of transfers on growth will differ across countries depending on the set of institutions in place, unless the transfers themselves alter institutional arrangements.

A difficulty in assessing directly the impact of the income associated with remittances is that, as we have seen, remittances are not randomly allocated across households. For example, in the Indian case, we might find an association between entrpreneurial activities and remittance income, but that just may be because households that have been able to succeed as entrepreneurs also have been able to finance family migration. One of the best quantitative studies of the effects of remittance income on household behavior is Yang (2005). In this study Philippines households experience changes in remittance income over a relatively short period of time due to exchange rate fluctuations. The fluctuations in transfer income are thus plausibly not associated with household preferences or abilities. Yang finds that exogenous increases in transfer income lead to shifts to more entrepreneurial activities and to increased school enrollment rates of children, factors that can lead to growth. This study basically identifies what economists call the pure income effect - effects induced by a change in income when no other changes occur, in either household composition or prices. Evidently in the Philippines, low-incomes, presumably because of credit constraints, have hampered activities that contribute to economic growth.

The Yang estimates of the income effects of transfers inform us about how reductions in transaction costs associated with shifting monies across borders would affect household behavior, at least in one context. However, the study does not fully address the issue of how increases in migration opportunities that would lead to increases in transfer incomes would affect growth and development in the receiving country. The reason is that transfers of monies and migration - the loss of family members - are linked. The "effects" of increased international transfers include effects associated with the departure of members of families, and these have additional but separate effects (net of income effects) on household resource allocations, just as the would the illness of a family member. The Yang study fixes household composition (appropriately), but increasing migration opportunities would clearly alter the composition of households. Most studies of transfer effects do not consider the associated changes in household composition that inevitably leads to shifts in responsibilities, in decision-making power, and resource allocations. Studies are needed on how the departure of a household member net of income effects alters household behavior directly, using models of households that incorporate preference differences among individual members and information asymmetries, as in Chen (2005), to obtain a complete picture of the impact of changing opportunities for obtaining remittance income. In India, for example, most of the temporary migrants to the Middle East are men; in their families during the period when are they are gone women may take on additional decision-making responsibilities, which may also entail the acquisition of new skills. This indirect of effect of temporary migration, correlated strongly with transfers, may be more important in causing structural change conducive to growth than the associated increase in transfer income.

#### E. CONCLUSION

The substantial differences in wages and, most relevantly, skill prices across countries indicates that there is a massive global mis-allocation of resources. Increased migration from poor to rich countries will clearly raise world output. The key question is the distribution of the gains from such movements of people, and in particular the contribution of international migration to the development of low-income countries. The substantial out-migration of persons from low-income countries is in part a manifestation of problems in those countries, whether due to poor institutions or poor geography. Increased remittance incomes associated with international migration will not directly affect these factors, although they can serve an important redistributive role across if not within countries, where there is some evidence the incidence of transfers is regressive. Perhaps the most important mechanism that can benefit sending countries needing much more attention is return migration, where migrants who acquire new skills, new money and new outlooks help transform the institution in their home countries. However, such volunteer return migration is likely to be attenuated to the extent that the problems inducing out-migration in the first place are not at least in part resolved. In that sense increased flows of people cannot completely substitute for the hard task of development within countries, a process which increased opportunities for migration can enhance.

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#### TABLES AND FIGURES

Country	Share in Category	Estimated Skill Price (\$)	
Mexico	.182	55.12	
Philippines	.050	25.64	
India	.043	12.33	
China	.040	48.42	
Colombia	.025	35.15	
Vietnam	.024	20.65	
Canada	.022	81.10	
Peru	.021	23.22	
Korea	.019	55.73	
El Salvador	.019	44.97	

## TABLE 1. ESTIMATED SKILL PRICES IN THE TOP TEN US IMMIGRANT-SENDING COUNTRIES FOR MARITAL IMMIGRANTS AGED 18 AND OVER

Source: Table 4 in Jasso and Rosenzweig (2005).

#### TABLE 2. MEAN REMITTANCES BY SCHOOLING LEVEL: 1996 MALE EMPLOYMENT AND SPOUSE IMMIGRANTS

Schooling Group	Remittances (\$)	Share of US Earnings (%)	Share of Pre-Immigration Earnings
All	1545	4.2	8.9
<12 years of schooling	612	2.9	7.6
High-school graduate	1945	6.5	11.1
College graduate and above	2100	4.0	6.9

*Source*: New Immigrant Survey, 1996 U.S. male employment principal and spouse visa-holders with an average of three years of residence in the United States.

Figure I: Percentage of New US "Permanent" Immigrants Who Say They Do Not Intend To Stay Permanently, by the Schooling Level of the Immigrant, 2003 Immigrant Cohort





## Figure II: Corrected and Uncorrected Measures of "Brain Drain": Proportion of Emigrated Foreign-Born With Tertiary Education for Six Top Brain-Drain Island Countries

Figure III: Corrected and Uncorrected Measures of "Brain Drain": Proportion of Emigrated Foreign-Born With Tertiary Education for Three Top Brain-Drain African Countries





Figure IV: "Brain Drain" and "Brain Gain": Adjusted Proportion of Emigrated Foreign-Born With Tertiary Education and Fraction of US-Educated Students Who Return

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## Figure V: "Brain Drain" and "Brain Gain": Adjusted Proportion of Emigrated Foreign-Born With Tertiary Education and Fraction of US-Educated Students Who Return

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## Figure VI: Average Remittance Value Received (2005 Rupees) and the Temporariness of Immigration: Indian Households with Family Members in the United States in 2005 With And Without Controls for Origin Family Status



No Control for Origin Family Socioeconomic Status

Control for Origin Family Socioeconomic Status

Figure VII: Proportion of Indian Households with an Immediate Family Member Abroad and Proportion Receiving Remittances, by Socioeconomic Status of Household Head in 2005



Immediate Family Member Abroad

**Received Remittance in Past Year**