

A Gendered Assessment of Highly Skilled Emigration

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INTERNATIONAL MIGRATION IS a diverse phenomenon whose effects on source and destination countries continue to attract the attention of policymakers, scholars, and international agencies. Understanding and measuring the consequences for migrants, host-country residents, and those who remain behind is a demanding task. In particular, the impact of highly skilled migration on sending countries arises from a combination of direct and feedback effects that are difficult to quantify. Lacking comparable data, the literature on the consequences of highly skilled emigration has, until recently, remained essentially theoretical.¹ New data sets have now been developed permitting assessment of the magnitude of international migration of the highly skilled. Docquier and Marfouk (2006) (henceforth DM06) provided estimates of emigration stocks and rates by educational attainment for 195 source countries in 2000 and 174 countries in 1990. This data set gave rise to a couple of variants (see Defoort 2008; Beine et al. 2007; Docquier and Bhargava 2006) and to a number of empirical studies on the determinants and consequences of highly skilled emigration.²

One important extension that has received little attention in the literature concerns the gender dimension of international migration. While a considerable literature has focused on male migration, less research has addressed female migration.³ Women have long been viewed as dependents, moving as wives, mothers, or daughters of male migrants. This is ironic since the share of women in international migration has increased over the last several decades. According to the United Nations Population Division, women made up 46.8 percent of the stock of international migrants in 1960 and 49.6 percent in 2005 (see <http://esa.un.org/migration>). Today, women exceed men in migration flows to developed regions (their share in flows increased from 48.9 to 52.2 percent over the same period).⁴ Fueling this trend

are such factors as the rise in women's educational attainment, the increased demand for women's labor in health care and the service sectors at large, and changes in attitudes toward female migration in many source countries. In 2004, 26.8 percent of women who received US employment-based visas were principal visa holders, while 34.7 percent of men who received such visas were dependents. Although family reunion programs admit many women in destination countries, women cannot be considered as solely companion migrants (Pearce 2006).

The increasing participation of women in international migration raises economic issues related to the gendered determinants and consequences of migration. The emigration of educated women is likely to affect sending countries in particular ways:

—First, a recent study by Beine et al. (2008) analyzes the impact of skilled emigration on human capital formation in developing countries. It shows that countries of origin may experience a "beneficial brain drain" or "brain gain" at low rates of emigration, because of the positive effect of skilled migration prospects on the return to human capital. When the emigration rate exceeds a threshold estimated at 20 percent, the origin country experiences a net loss of human capital. The net loss increases exponentially with the skilled emigration rate. And, since women in developing countries still face unequal access to tertiary education and highly skilled jobs, the emigration of educated women is likely to generate higher relative losses of human capital than the emigration of skilled males. Many studies report that women's human capital is an even scarcer resource than men's. Our estimates based on Barro and Lee's human capital indicators (2001) reveal that the percentage of women aged 25+ worldwide with some post-secondary education rose from 7.3 to 9.8 percent between 1990 and 2000, while the percentage of men at comparable levels rose from 10.9 to 12.5. The portion of women aged 25+ with completed secondary education rose from 31.6 to 34.7 percent during the same period, while the portion of men rose from 45.4 to 46.8 percent. Although the gender gap decreased over time, women still lag far behind men. In addition, convergence of the sexes by these criteria is mainly evident in high-income countries, where recent generations of women are educated as highly as or more highly than young men. In contrast, in low-income countries in 2000, only 2.4 percent of women had post-secondary education, against 5.5 percent for men and the convergence is slow.

—Second, the links between women's migration and human capital accumulation are particularly critical for developing countries since women's level of schooling is usually considered a fundamental ingredient for growth. Many studies demonstrate that women's education is positively associated with investments in children's education and thus has pronounced effects on the human capital of future generations (see World Bank 2007). Better-educated mothers are superior teachers in the home, as demonstrated by Behrman et al. (1999) for India. Hence, for a given investment in children,

better-educated mothers raise children with higher levels of human capital (Haveman and Wolfe 1995; Summers 1992). One can also argue that educated women contribute more income to the household, which leads to greater investment in child schooling and lower fertility rates (see among others Basu 2002). Another argument is that mothers with high levels of education have greater command of resources within the household (higher bargaining power), which they choose to allocate to children at higher levels than do men (see Quisumbing 2003). Unsurprisingly, at the aggregate level, many studies have emphasized the role of female education in raising labor productivity and economic growth, suggesting that gender gaps in education are an impediment to economic development. (For examples, see Knowles et al. 2002, who use Barro and Lee's human capital indicators; and Coulombe and Tremblay 2006, who rely on the International Adult Literacy Survey to create a standardized indicator of human capital.) These studies suggest that investment in women's human capital is crucial in countries where the gender gap in education is high.⁵ Societies that fail to invest adequately in girls or that lose a high proportion of educated women through emigration may experience slower growth and reduced income. Alternatively, societies that experience a "brain gain" linked to emigration prospects could experience higher growth.

—Third, regarding the determinants of migration, some scholars argue that women and men do not respond to push and pull factors with the same intensity. Social networks are usually seen as more important for women, who rely more strongly on relatives and friends for help, information, protection, and guidance at their destination. In addition, educated women are better able than uneducated women to escape from the sexual discrimination they must endure in many developing countries. Better-educated men stay in those countries because they do not face the same barriers to career advancement as women do, especially women in highly sexist societies.

—Finally, Morrison, Schiff, and Sjöblom (2007) show that the increasing participation of women in international migration affects future amounts of remittances, the size of diaspora externalities (e.g., network-based effects on trade, foreign direct investment, technology diffusion), and the structure of labor and other contributions in source countries. They find that as compared to male migrants, female migrants send remittances over longer time periods; send larger amounts to distant family members; and have different impacts on household expenditures at origin. Chant (1992), Curran and Rivero-Fuentes (2003), Collinson et al. (2003), and Vanwey (2004) show that, after controlling for households' characteristics, women remit home at a higher rate than men.

Without a gendered assessment of highly skilled migration, it is impossible to conduct a complete analysis of these issues. In this article we quantify and characterize the gender composition of international migration by educational attainment. We build on the DM06 data set, update the data using new sources, standardize 1990 and 2000 categories, and introduce

a gender breakdown. We provide new data on stocks and rates of emigration by level of schooling and gender. Our gross data reveal that the share of women in the highly skilled immigrant population increased in almost all OECD destination countries between 1990 and 2000. Consequently, for the vast majority of source regions, the growth rates of highly skilled female emigrants were greater than the growth rates for low-skilled women or highly skilled men. The evolution was particularly notable in the least developed countries. The increasing share of women in South-to-North skilled migration flows mostly reflects gendered changes in levels of education. We show that the cross-country correlation between emigration stocks of women and men is extremely high (about 97 percent), with women's numbers slightly below men's. However, these skilled female migrants are drawn from a much smaller population of highly educated women. Hence, in relative terms, the correlation between men and women in rates (88 percent) is lower than in stocks. On average, highly skilled women's emigration rate is 17 percent above men's. This gender gap in the highly skilled migration rate is strongly correlated with the gender gap in educational attainment of the source population, reflecting unequal access to education.

Background

In the first concerted effort to provide comparable international data on migration rates by education level, Carrington and Detragiache (1998, 1999) used 1990 US census data and other OECD statistics on international migration to construct estimates of emigration rates at three education levels for 61 developing countries (including 24 African countries). Adams (2003) used the same technique to compile estimates for 24 countries in 2000. Although Carrington and Detragiache's study initiated new debates on skilled migration, their estimates have a number of limitations. The two most important ones are: 1) they applied the education structure of the US immigration to immigration to other OECD countries; and 2) they estimated immigration to EU countries using OECD statistics reporting the number of immigrants for the major countries of emigration only, which led to underestimation of immigration from countries with lesser rates of emigration.

Docquier and Marfouk (2006) standardized this work by providing a comprehensive data set on international migration to the OECD by educational attainment. The construction of DM06 relied on three steps: 1) collection of census and register information on the structure of immigration to all OECD countries (this solves the problems noted for Carrington and Detragiache); (2) summation over source countries (this allows for the evaluation of the stock of immigrants from any given sending country to the OECD area by education level); and 3) comparison of the educational structure of emigrants to that of the population remaining at home (which allows for computing emigration rates by educational attainment in 1990 and 2000).

The DM06 data rely on some assumptions that were relaxed in a couple of variants. Most of these variants required additional assumptions but largely confirmed the reliability of DM06 data in descriptive analysis and empirical regressions.

—First, with only two points in time, DM06 does not give a precise picture of the long-run trends in international migration. To remedy this problem, Defoort (2008) computes highly skilled emigration stocks and rates from 1975 to 2000 (one observation every five years). She uses the same methodology as in DM06 but focuses on the six major destination countries (the United States, Canada, Australia, Germany, Britain, and France). Her study shows that, at the world level or at the level of developing countries as a whole, the average emigration rate of highly skilled workers has been extremely stable over the period. This suggests that the heterogeneity in highly skilled migration is mostly driven by the cross-sectional variability. This observation reinforces the value of the DM06 cross-country data set based on a much more comprehensive set of destination countries.

—Second, counting all foreign-born individuals as immigrants independently of their age at arrival, DM06 does not account for whether education has been acquired in the home country or the host country. Controlling for the country of training can be important when dealing with such issues as the fiscal cost of skilled emigration. Beine, Docquier, and Rapoport (2007) use immigrants' age of entry as a proxy for where education has been acquired and propose alternative measures by defining emigrants as those who left their home country after age 22, 18, or 12 years. Data on age of entry are collected in a dozen OECD countries. For those countries for which such data cannot be obtained, Beine et al. estimate the age-of-entry structure using a gravity model (which takes into account distance between origin and destination countries, income gap between them, etc.). They find that these adjusted highly skilled emigration rates are highly correlated with rates reported in DM06.⁶

—Third, general emigration rates may hide critical occupational shortages (e.g., among engineers, teachers, physicians, nurses, IT specialists, etc.). In poor countries shortages are particularly severe in the medical sector, where the number of physicians per 1,000 inhabitants is extremely low. Clemens and Pettersson (2006) and Docquier and Bhargava (2006) provide data on the emigration of health care workers. The correlation between medical emigration rates (as measured by Docquier and Bhargava) and DM06 general emigration rates amounts to 40 percent. This suggests that the aggregate rate of emigration computed for workers with post-secondary education may imperfectly capture the occupational structure of the brain drain.

The gender dimension of emigration has been largely undocumented. An exception is a study by Dumont, Martin, and Spielvogel (2007) that relies on a methodology similar to the one used here and analyzes emigration rates in 2000 by gender and educational level from some 75 countries. We use a slightly different definition of highly skilled migration (including all post-sec-

ondary educational levels, even those with one year of US college) and rely on plausible estimates of the educational structure of the adult population in countries where human capital indicators are missing. We provide emigration stocks and rates for 195 countries in 1990 and 2000. Our data set can be used to quantify the recent trend in women's skilled migration and to analyze its causes and consequences for developing countries.

Methodology

This section describes the methodology used to compute emigration stocks and rates by educational attainment and gender for each source country in 1990 and 2000.

Emigration stocks

It is well documented that, with a few exceptions (such as Australia and New Zealand), statistics provided by source countries do not offer a realistic picture of emigration. When available, which is rare, statistics are incomplete, imprecise, and give no information on emigrants' level of education, gender, and country of destination. While detailed immigration data are not easy to collect on a homogeneous basis, information on emigration can only be captured by aggregating consistent immigration data collected in *receiving* countries, where information about the birth country, gender, and education of the native-born and immigrant populations is available from national censuses and registers (or samples of them). The receiving country j 's census usually identifies individuals on the basis of age, gender g , country of birth i , and skill level s . Our method consists in collecting (census or register) gender-disaggregated data from a large set of receiving countries, with the highest level of detail on birth countries and three levels of educational attainment: $s = h$ for highly skilled, $s = m$ for medium-skilled, and $s = l$ for low-skilled. Let $M_{t,g,s}^{i,j}$ denote the stock of adults aged 25 years and older born in j , of gender g , skill s , living in country j at time t . Table A.1 in the appendix describes our data sources. Aggregating these numbers over destination countries j gives the stock of emigrants from country i : $M_{t,g,s}^i = \sum_j M_{t,g,s}^{i,j}$. This is the method used in DM06, without gender breakdown.

By focusing on census and register data, our methodology fails to capture illegal immigrants, for whom systematic statistics by education level and country of birth are not available,⁷ except in the United States. Demographic evidence indicates that most illegal residents in the United States are identified in the census. However, other host countries provide no accurate data about the educational status of illegal migrants. Although there may be some instances of undocumented highly skilled migrants (such as Indians overstaying H-1B visas in the United States), it is widely believed that the majority of undocumented residents are low-skilled. Hence, we probably underestimate

the number of low-skilled migrants. This limitation is not expected to distort our estimates of the migration rate of highly skilled workers.

In the following analysis, we rely on the same principles as in DM06 and turn our attention to the homogeneity and comparability of the data. This requires a couple of methodological choices:

—The term “source country” usually designates independent states. We distinguish 195 source countries: 190 UN member states (after aggregating North and South Korea), Holy See, Taiwan, Hong Kong, Macao, and Palestinian Territories. We aggregate North and South Korea, West and East Germany, and the Democratic Republic and the Republic of Yemen. We consider the same set of source countries in 1990 and 2000, although some of them had no legal existence in 1990 (before the break-up of the Soviet Union, the dissolution of Yugoslavia and Czechoslovakia, and the German and Yemen reunifications) or became independent after 1 January 1990 (Eritrea, East Timor, Namibia, Marshall Islands, Micronesia, Palau). In these cases, the 1990 estimated stock for each country of origin is obtained by multiplying the 1990 total value for the pre-secession state by the 2000 country share in the stock of immigrants (the share is gender- and skill-specific).

—The set of receiving countries is restricted to OECD member countries. We thus focus on the structure of “South-to-North” and “North-to-North” migration. The skill level of immigrants in non-OECD countries is expected to be very low, except in a few countries such as South Africa (1.3 million immigrants in 2000), the six member states of the Gulf Cooperation Council (total of 9.6 million immigrants in 2000 in Saudi Arabia, United Arab Emirates, Kuwait, Bahrain, Oman, and Qatar), some Eastern Asian countries (4 million immigrants in 2000 in Hong Kong and Singapore combined). According to their census and survey data, about 17.5 percent of adult immigrants in these countries have tertiary-level education (17 percent in Bahrain, 17.2 percent in Saudi Arabia, 14 percent in Kuwait, 18.7 percent in South Africa). Considering that children constitute about 25 percent of the immigrant stock, we estimate the number of educated workers at 1.9 million in all of these countries combined. The number of educated immigrants in the rest of the non-OECD world lies between 1 million and 4 million (if the average proportion of educated immigrants among adults lies between 2.5 and 10 percent). This implies that by focusing on OECD countries, we should include a large fraction of worldwide educated migrants (about 90 percent). Nevertheless, we are aware that by disregarding non-OECD immigration countries, we probably underestimate the number of highly skilled emigrants from several developing countries (such as Egypt, Sudan, Jordan, Yemen, Pakistan, and Bangladesh in the neighborhood of the Gulf states; and from Botswana, Lesotho, Namibia, Swaziland, and Zimbabwe). Incorporating data collected from selected non-OECD countries could refine the data set. To allow comparisons between 1990 and 2000, we consider the same 30 receiving countries in 1990 and 2000. Consequently, the Czech Republic, the Slovak Republic, Hungary,

Korea, Poland, and Mexico are considered as receiving countries in 1990 even though they were not yet members of the OECD.

—We consider only the adult population aged 25 and over. This excludes students who temporarily emigrate to complete their education. In addition, this age restriction allows us to compare the numbers of migrants at various education levels with data on educational attainment in source countries. Because we have no systematic information on the age at entry, it is impossible to distinguish between immigrants who were educated at the time of their arrival and those who acquired education after they settled in the receiving country; for example, Mexican-born individuals who arrived in the United States at age five or ten years and graduated from US institutions of higher education are counted as highly skilled immigrants. As mentioned above, Beine et al. (2007) provided adjusted measures by age of entry and found a very high correlation with the unadjusted numbers.

—Migration is generally defined on the basis of the country of birth rather than citizenship. While citizenship characterizes the foreign population, the “foreign-born” concept better captures the decision to emigrate. Usually, the number of foreign-born individuals is much higher than the number of foreign-born naturalized citizens (twice as large in countries such as Hungary, the Netherlands, and Sweden).⁸ Another reason is that apart from changes in political boundaries the concept of country of birth is time-invariant (unlike citizenship, which changes with naturalization) and independent of the changes in policies regarding naturalization.⁹ The number of foreign-born persons can be obtained for a large majority of OECD countries, although in a limited number of cases the national census only gives immigrants’ citizenship (Germany, Hungary, Italy, Japan, and Korea).¹⁰ In these five cases, migrants are defined on the basis of their citizenship. The concept of foreign-born is not homogeneous across OECD countries. In most receiving countries, the foreign-born are individuals born abroad with foreign citizenship at birth.¹¹ In a few countries (Australia, New Zealand, Belgium), foreign-born means “overseas-born,” that is, any individual born abroad.

—We distinguish three levels of education. Medium-skilled migrants are those with completed upper-secondary education. Low-skilled migrants have less than completed upper-secondary education, including those with only lower-secondary and primary education and those who did not go to school. Highly skilled migrants have post-secondary education.¹² This grouping is consistent with Barro and Lee’s human capital indicators (based on the 1976 International Standard Classification of Education, or ISCED). Some migrants did not report their education level. As in DM06, we classify these unknowns as low-skilled migrants.¹³ Educational categories are constructed on the basis of country-specific information and are consistent with human capital indicators available for all sending countries. A mapping between the country’s official classification and our ISCED groups is sometimes required to harmonize the data.¹⁴

Emigration rates

We count as migrants all adult (25 and over) foreign-born individuals living in an OECD country. However, it seems obvious that the labor market impact on the source country of the emigration of some 1 million highly skilled Indians (4.3 percent of India's educated adult population) is less important than the impact on the source country of the emigration of some 16,000 highly skilled workers from Grenada (84 percent of Grenada's educated adult population). A more meaningful measure can be obtained by comparing the emigration stocks to the total number of persons born in the source country and belonging to the same gender and educational category. This method allows us to evaluate the relative impact of emigration on the source-country labor market.

In line with Carrington and Detragiache (1998), Adams (2003), Docquier and Marfouk (2006), and Dumont and Lemaître (2004), our second step is to calculate the highly skilled emigration rate as a proportion of the total educated population born in the source country. Although our analysis is based on stocks (rather than flows), we refer to these proportions as emigration rates. Denoting $N_{t,g,s}^i$ as the stock of individuals aged 25+, of skill s , gender g , living in source country i , at time t , we define the emigration rates as

$$m_{t,g,s}^i = \frac{M_{t,g,s}^i}{N_{t,g,s}^i + M_{t,g,s}^i}. \quad (1)$$

In particular, $m_{t,g,h}^i$ is a gendered relative measure of highly skilled emigration from the source country i .

This step requires data on the size and the skill and gender structure of the adult population in source countries. Population data by age are provided by the United Nations.¹⁵ Data are missing for a few countries such as Taiwan, but can be estimated using the CIA world factbook.¹⁶ Population data are split across educational groups using international human capital indicators. Several sources of data on educational attainment and/or enrollment variables can be found in the literature. As in Docquier and Marfouk (2006), human capital indicators are taken from De La Fuente and Domenech (2002) for OECD countries and from Barro and Lee (2001) for non-OECD countries. For countries where Barro and Lee's measures are missing, we estimate the proportions educated using Cohen and Soto's measures (see Cohen and Soto 2007). In the remaining countries where both Barro–Lee and Cohen–Soto data are missing (about 70 countries in 2000), we apply the educational proportions of the neighboring country having the closest enrollment rate in secondary/tertiary education, the closest gender gap in enrollment rates, and/or the closest GDP per capita. This method gives good approximations of the rate of highly skilled emigration.

Results

We describe the main results for migration stocks and rates by country group, identify the sending countries most affected by highly skilled emigration, and indicate the share of women in highly skilled migration.

Migration stocks

We record 41.7 million immigrants aged 25 and older in 1990 and 58.2 million in 2000 in the OECD area. According to our estimates, the average share of women in the OECD immigrant population increased from 50.6 percent to 50.9 percent between 1990 and 2000. These percentages (for adults 25 and over) are in line with figures from the UN Population Division (for all ages) reported for the OECD area (50.2 and 50.6 percent for these two years). At the country level, this share increased in 20 OECD countries and decreased in ten countries. In 2000, the national proportions of women in the adult immigrant population ranged from 41.8 percent in Iceland to 59.8 percent in Poland.

A first advantage of our data set is that it provides comparable statistics on the entry of highly skilled immigrants. Our estimates show that the average share of women in the skilled immigrant population increased from 46.7 to 49.3 percent between 1990 and 2000. In 2000, country-specific shares range from 39.8 percent in Iceland to 56.4 in Poland.¹⁷ The share increased in 27 countries and decreased in only three (Portugal, Spain, and Belgium). Remarkable increases in female share were observed in the Czech Republic (+18.6 percentage points), Finland (+9.2), and Turkey (+9.1).

Our data set also distinguishes migrants by country of birth. This allows us to quantify and characterize the structure of emigration by educational level and gender. Table 1 gives the emigration stocks for 1990 and 2000. We distinguish total, low-skilled, and highly skilled emigration stocks; the medium-skilled can be easily obtained by subtraction. Although our data set reveals specific information by country of origin, here we report data by country group only. We consider income groups (following the World Bank classification), regional groups as defined in the UN classification, as well as groups of particular interest (sub-Saharan Africa, Latin America and the Caribbean, Middle East and Northern Africa, and Islamic countries).

The proportions of women in highly skilled and low-skilled emigration are positively correlated (correlation rate of 0.57 in 2000). Women account for a large proportion of highly skilled emigrants from high-income countries (50.3 percent in 2000), lower-middle-income countries (51.5 percent), and small island developing states (54.4 percent). In contrast, their share is much lower in highly skilled emigration from low-income countries (42.3 percent), the least developed countries (41.8 percent), sub-Saharan Africa (42.4 percent), MENA (38.2 percent), and Islamic countries (40.4 percent).

Between 1990 and 2000, the number of highly skilled women emigrants increased by 73 percent (from 5.8 to about 10.1 million). The rate of growth was much lower for low-skilled women (+22 percent). The number of skilled women emigrants increased 1.5-fold in low-income countries and more than 1.2-fold in the least developed and sub-Saharan African countries. In all regions except Middle Africa, the growth rate of the stock of female highly skilled emigrants was always greater than the rate for comparable males. At the regional level, major increases in female highly skilled emigration are observed in Central Asia (+412 percent), Western Africa (+177 percent), Southern Asia (+141 percent), Central America (+137 percent), and Southern Africa (+118 percent).

The increase in the emigration of highly skilled women is observed in every source region and is partly because women's rise in schooling level was more rapid than men's rise. At the world level, the female educated adult population increased by 68 percent (this growth rate reaches 105 percent for the least developed countries). In comparison, the male educated adult population increased by only 42 percent on average (71 percent for the least developed countries). Besides this supply effect, women's increasing participation in skilled emigration also reflects an increased demand for women's labor in health care sectors and other services, the increased importance of family reunion programs, and cultural and social changes in attitudes toward female migration in many source countries.

Emigration rates

As pointed out above, a more meaningful measure of rates of highly skilled emigration can be obtained by comparing the emigration stocks to the total number of persons born in the source country and belonging to the same gender and educational category. Table 2 shows the emigration rates of low-skilled and highly skilled workers, as well as global emigration rates by country groups and region of origin in 1990 and 2000.¹⁸

In all regions, highly skilled emigration rates are much greater than low-skilled rates. The skill-related gap is particularly wide in poor countries, where the propensity to move among highly skilled workers is 10 to 20 times larger than among the low-skilled. The largest highly skilled emigration rates in 2000 are obtained in the Caribbean (43.0 percent) and Pacific islands (52.3 percent). Figures above 10 percent are also observed in Middle, Eastern, and Western Africa, Central America, and Northern and Southern Europe. On the whole, highly skilled emigration rates are high in poor regions with small countries.

At the world level, women and men exhibit nearly identical total emigration rates in the two periods (1.6 percent in 1990 and 1.8 percent in 2000). Women's average emigration rates are, however, lower than men's in the less developed countries, especially in Northern and sub-Saharan Africa. In contrast, highly skilled emigration rates are higher among women. In 2000,

TABLE 1 Stocks of emigrants aged 25+ who emigrated to OECD countries by education and gender in 1990 and 2000 (in thousands)

	1990						2000							
	Total		Low-skilled		Highly skilled		Total		Low-skilled		Highly skilled			
	All education levels		Less than secondary		Post-secondary		All education levels		Less than secondary		Post-secondary			
	All	Women	All	Women	All	Women	All	Women	All	Women	All	Women		
												Percent women		
World	41706	21090	20414	10523	12501	5833	47	58246	29623	25068	12820	20442	10070	49
Income groups^a														
High-income countries	18046	9550	7991	4310	5749	2797	49	19717	10415	6936	3717	7911	3977	50
Upper-middle-income countries	9125	4408	5433	2667	2027	913	45	15339	7482	8572	4126	3729	1839	49
Lower-middle-income countries	9843	4945	4753	2409	3144	1505	48	15505	8037	6432	3322	5691	2929	51
Low-income countries	3507	1592	1565	793	1317	495	38	6445	3064	2290	1220	2918	1235	42
United Nations classification^b														
Least developed countries	1354	606	714	350	412	153	37	2364	1127	1049	542	814	340	42
Landlocked developing countries	783	362	373	182	264	112	42	1333	652	511	264	524	241	46
Small island developing states	2643	1411	1149	620	918	471	51	4123	2249	1598	868	1536	835	54
United Nations classification^c														
Africa	2837	1162	1717	723	724	260	36	4352	1918	2136	967	1373	556	40
Eastern Africa	516	248	212	115	205	81	40	812	411	234	136	346	152	44
Middle Africa	103	43	42	20	38	13	34	214	99	88	47	74	28	37
Northern Africa	1671	650	1226	489	259	87	33	2252	926	1464	625	457	167	37
Southern Africa	135	70	30	17	79	36	46	272	142	32	19	177	87	49
Western Africa	412	151	208	82	143	44	30	803	341	318	141	319	122	38

Americas	8439	4360	4151	2103	2641	1340	51	15493	7826	7599	3682	4631	2429	52
Caribbean	1955	1050	839	450	693	362	52	3011	1663	1155	626	1150	643	56
Central America	3486	1660	2412	1139	604	283	47	8050	3749	5344	2445	1377	670	49
South America	1574	851	492	281	628	313	50	2899	1577	818	455	1155	613	53
North America	1424	798	408	233	717	382	53	1534	837	282	156	950	502	53
Asia	9402	4664	3956	2062	3781	1714	45	15199	7794	5435	2910	7003	3408	49
Central Asia	35	19	19	10	8	5	54	83	46	26	14	40	23	58
Eastern Asia	2645	1425	789	462	1282	621	48	4123	2278	1046	611	2251	1174	52
Southern Asia	1961	859	732	362	853	312	37	3472	1575	1054	541	1823	752	41
South-Eastern Asia	2577	1405	959	553	1191	616	52	4354	2464	1347	809	2148	1167	54
Western Asia	2184	957	1457	675	447	160	36	3168	1431	1962	936	740	292	39
Europe	19318	10038	9788	5221	4869	2288	47	21170	11049	8901	4742	6864	3397	49
Eastern Europe	3615	1917	1895	1065	867	398	46	4436	2445	1687	975	1571	826	53
Northern Europe	4513	2441	1513	850	1564	767	49	4646	2474	1130	636	2066	1026	50
Southern Europe	6948	3285	4763	2336	965	393	41	7494	3589	4682	2308	1377	609	44
Western Europe	4242	2395	1617	970	1473	729	50	4595	2542	1402	823	1850	936	51
Oceania	524	273	129	71	221	107	49	792	410	159	83	379	192	51
Australia and New Zealand	383	199	75	41	166	81	49	564	290	80	40	293	149	51
Other Oceania	141	73	54	29	55	26	47	228	120	79	43	86	43	50
Groups of interest^d														
Sub-Saharan Africa	1166	512	491	234	465	174	37	2101	993	672	342	916	388	42
LAC countries	7015	3561	3743	1870	1925	958	50	13960	6989	7317	3526	3682	1927	52
MENA countries ^e	2751	1099	1600	671	748	253	34	3823	1610	1938	856	1228	469	38
Islamic countries ^f	5996	2547	3664	1620	1400	511	37	8858	3934	4756	2203	2500	1009	40

^a <http://www.worldbank.org/>

^b <http://www.un.org/>

^c <http://unstats.un.org/>

^d Sub-Saharan Africa = Africa excluding Northern Africa; LAC = Central America + South America + Caribbean; MENA = Middle East + Northern Africa.

^e <http://www.worldbank.org/>

^f <http://www.oic-oci.org/>

NOTE: Developing countries correspond to the sum of low-income, lower-middle-income, and upper-middle-income countries. World refers to the sum of developing countries, high-income countries, and emigrants who did not report their country of birth. The last category is not reported in the table.

TABLE 2 Rates of emigration to OECD countries in the population aged 25+ by education and gender in 1990 and 2000 (in percent)

	Rates in 1990						Rates in 2000					
	Total		Low-skilled		Highly skilled*		Total		Low-skilled		Highly skilled*	
	All education levels		Less than secondary		Post-secondary		All education levels		Less than secondary		Post-secondary	
	All	Women	All	Women	All	Women	All	Women	All	Women	All	Women
World	1.6	1.6	1.3	1.2	5.1	5.9	1.8	1.8	1.3	1.2	5.5	6.0
Income groups^a												
High-income countries	3.0	3.1	3.9	3.8	4.0	4.4	2.9	3.0	3.6	3.5	3.8	4.0
Upper-middle-income countries	2.5	2.3	2.7	2.3	5.5	5.5	3.5	3.2	3.6	3.0	6.2	6.5
Lower-middle-income countries	1.1	1.1	0.8	0.7	8.1	11.2	1.3	1.3	0.9	0.8	8.1	10.7
Low-income countries	0.5	0.5	0.3	0.3	5.5	7.5	0.7	0.7	0.3	0.3	7.5	10.2
United Nations classification^b												
Least developed countries	0.7	0.6	0.4	0.4	11.4	16.1	0.9	0.9	0.5	0.5	12.3	17.1
Landlocked developing countries	0.7	0.6	0.5	0.4	5.0	5.3	1.0	0.9	0.5	0.5	6.0	6.7
Small island developing states	9.6	10.2	5.6	5.9	43.1	49.4	11.1	11.9	6.4	6.8	41.1	47.2
United Nations classification^c												
Africa	1.2	1.0	0.9	0.7	11.2	15.6	1.4	1.2	0.9	0.7	10.4	13.1
Eastern Africa	0.8	0.7	0.4	0.4	16.5	20.7	0.9	0.9	0.3	0.3	18.1	23.0
Middle Africa	0.4	0.3	0.2	0.2	9.7	17.6	0.7	0.6	0.3	0.3	10.4	22.6
Northern Africa	2.9	2.2	2.6	1.9	9.2	11.7	2.9	2.4	2.6	2.0	7.8	8.6
Southern Africa	0.8	0.8	0.2	0.3	11.3	16.9	1.1	1.1	0.3	0.3	7.3	7.6
Western Africa	0.7	0.5	0.4	0.3	11.0	17.4	1.0	0.8	0.5	0.4	13.9	31.7
Americas	2.2	2.2	2.5	2.5	2.9	3.3	3.3	3.2	4.0	3.7	3.3	3.4
Caribbean	12.8	13.4	8.2	8.4	44.0	47.8	15.5	16.6	10.4	10.8	43.0	47.9
Central America	7.4	6.9	7.3	6.5	13.7	16.2	11.7	10.6	12.1	10.6	17.1	19.0
South America	1.2	1.2	0.5	0.5	4.8	5.2	1.6	1.7	0.7	0.7	5.1	5.5
North America	0.8	0.8	1.9	2.5	1.0	1.2	0.7	0.8	2.2	2.5	0.9	0.9

Asia	0.6	0.6	0.4	0.4	5.2	7.1	0.8	0.8	0.4	0.4	5.7	7.6
Central Asia	0.2	0.2	0.3	0.2	0.3	0.4	0.3	0.3	0.3	0.2	0.9	1.2
Eastern Asia	0.4	0.4	0.2	0.2	3.7	5.7	0.5	0.5	0.2	0.2	4.1	6.0
Southern Asia	0.4	0.4	0.2	0.2	4.5	6.4	0.5	0.5	0.2	0.2	6.0	8.3
South-Eastern Asia	1.4	1.5	0.6	0.7	10.8	12.5	1.7	1.9	0.7	0.8	9.8	11.4
Western Asia	3.3	3.0	3.1	2.7	8.0	7.9	3.5	3.3	3.3	3.0	7.1	7.1
Europe	4.0	3.8	4.9	4.2	7.0	7.3	4.1	4.0	4.3	3.8	7.2	7.5
Eastern Europe	1.8	1.8	3.2	2.3	3.6	3.5	2.2	2.2	2.4	2.0	4.5	4.9
Northern Europe	6.9	7.1	5.7	5.8	14.4	15.4	6.7	6.8	5.2	5.4	14.0	14.1
Southern Europe	7.0	6.3	6.5	5.9	11.5	10.4	6.8	6.2	6.5	5.9	10.9	10.0
Western Europe	3.4	3.7	4.1	4.1	5.6	6.5	3.4	3.6	3.3	3.3	5.7	6.1
Oceania	3.4	3.5	2.2	2.2	5.5	6.9	4.3	4.3	2.5	2.5	7.2	8.0
Australia and New Zealand	3.0	3.0	1.9	1.9	4.3	5.3	3.7	3.6	2.1	2.0	5.7	6.4
Other Oceania	6.0	6.6	2.8	3.1	61.2	71.0	7.2	7.7	3.1	3.3	52.3	63.1
Groups of interest^d												
Sub-Saharan Africa	0.7	0.6	0.3	0.3	12.8	18.7	0.9	0.9	0.4	0.3	12.5	16.8
LAC countries	3.5	3.5	2.6	2.5	10.1	11.2	5.3	5.1	4.1	3.8	11.0	12.0
MENA countries ^e	2.8	2.3	2.1	1.7	11.3	12.1	2.8	2.4	2.1	1.7	9.1	9.6
Islamic countries ^f	1.5	1.2	1.1	0.9	8.4	10.2	1.6	1.4	1.2	1.0	7.4	8.9

^aThe highly skilled emigration rate is defined in Equation 1.

^b<http://www.worldbank.org>

^c<http://www.un.org/>

^d<http://unstats.un.org/>

^eSub-Saharan Africa = Africa excluding Northern Africa; LAC = Central America + South America + Caribbean; MENA = Middle East + Northern Africa.

^f<http://www.worldbank.org/>

^g<http://www.oic-oci.org/>

NOTE: Developing countries correspond to the sum of low-income, lower-middle-income, and upper-middle-income countries. World refers to the sum of developing countries, high-income countries, and emigrants who did not report their country of birth. The last category is not reported in the table.

the average (weighted) female/male ratio of highly skilled emigration rates amounted to 1.2. Huge differences were observed in regions where women have poor access to education, such as Middle Africa, Eastern Asia, Southern Africa, and Western Africa. Women's highly skilled emigration rate exceeds men's in 81 percent of the cases (160 countries). Countries exhibiting the highest female/male ratios of emigration rates are sub-Saharan African countries (such as Nigeria, Cameroon, São Tomé and Príncipe, the Democratic Republic of Congo) as well as Bangladesh and Thailand. In contrast, highly

TABLE 3 Top 30 total and skilled emigration stocks and rates of individuals aged 25+ in 2000

Stock: All education levels				Stock: Highly skilled			
Country	Total	Women	Percent women	Country	Total	Women	Percent women
Mexico	6,434	2,916	45.3	United Kingdom	1,478	707	47.8
United Kingdom	2,990	1,547	51.7	Philippines	1,111	670	60.3
Italy	2,337	1,094	46.8	India	1,034	444	42.9
Germany	2,299	1,321	57.4	Mexico	949	448	47.2
Turkey	1,942	887	45.7	Germany	937	490	52.4
India	1,696	799	47.1	China	783	392	50.0
Philippines	1,678	1,043	62.2	Korea	613	319	52.0
China	1,676	888	53.0	Canada	523	279	53.3
Vietnam	1,261	639	50.7	Vietnam	506	226	44.8
Portugal	1,209	590	48.8	Poland	455	248	54.6
Korea	1,205	681	56.5	United States	426	223	52.4
Poland	1,122	630	56.1	Italy	395	162	41.1
Morocco	1,067	450	42.2	Cuba	332	170	51.1
Cuba	872	454	52.1	France	311	165	53.2
Canada	854	480	56.2	Iran	303	122	40.1
France	796	439	55.1	China, Hong Kong SAR	293	146	49.8
Ukraine	748	439	58.7	Jamaica	287	178	62.1
Greece	714	332	46.6	Japan	278	163	58.6
Spain	711	374	52.7	Taiwan	274	150	54.7
Serbia and Montenegro	684	325	47.6	Russia	270	156	57.7
Jamaica	681	388	57.0	Netherlands	255	112	44.1
Ireland	680	368	54.0	Ukraine	249	137	54.9
United States	680	357	52.6	Colombia	233	127	54.6
El Salvador	665	336	50.6	Ireland	228	117	51.1
Algeria	609	252	41.3	Pakistan	221	82	37.4
Pakistan	582	253	43.4	New Zealand	175	86	49.5
Dominican Republic	579	334	57.7	Turkey	175	64	36.5
Colombia	575	335	58.2	South Africa	173	85	49.4
Netherlands	571	278	48.6	Peru	164	85	52.1
Russia	553	328	59.3	Romania	163	81	49.6

skilled men are more mobile than women in the Middle East and in such Asian countries as Bhutan, Cambodia, Burma, and Vietnam.

Countries most affected by emigration

Table 3 lists countries sending the largest stocks of migrants to the OECD countries. In absolute terms (number of educated emigrants), the most populous countries are the main exporters of highly skilled emigrants. However, the elasticity of emigration stock to population size amounts to 0.63 (less than

TABLE 3 (continued)

Rate: All education levels			Rate: Highly skilled		
Country	Total	Women	Country	Total	Women
Grenada	53.6	56.8	Guyana	89.2	90.5
Saint Kitts and Nevis	49.4	50.8	Jamaica	84.7	87.7
Suriname	46.8	47.9	Saint Vincent and the Grenadines	84.6	88.7
Samoa	46.0	47.7	Grenada	84.3	90.6
Tonga	45.5	45.0	Haiti	83.4	85.8
Guyana	43.0	43.5	Cape Verde	82.4	79.8
Dominica	41.5	44.1	Palau	80.9	89.7
Saint Vincent and the Grenadines	37.2	40.0	Trinidad and Tobago	78.9	83.3
Jamaica	34.9	37.2	Saint Kitts and Nevis	78.5	79.6
Antigua and Barbuda	33.7	36.0	Seychelles	77.2	84.4
Barbados	32.3	32.8	Tonga	75.6	80.5
Cape Verde	30.4	29.4	Samoa	73.4	80.3
Belize	28.2	31.4	Nauru	72.0	83.5
Malta	27.2	26.3	Saint Lucia	68.6	74.3
Trinidad and Tobago	25.3	27.5	Antigua and Barbuda	68.5	70.6
Ireland	22.7	23.6	Gambia	67.8	59.5
Seychelles	22.6	26.1	Suriname	65.8	66.9
Saint Lucia	21.7	22.9	Belize	65.5	77.2
Fiji	20.6	21.5	Tuvalu	64.9	74.5
El Salvador	19.7	18.9	Dominica	63.9	68.8
Albania	19.1	16.0	Fiji	62.8	69.5
Cyprus	18.6	17.7	Barbados	62.6	64.1
Macedonia	16.9	16.2	Malta	58.3	60.5
Bosnia and Herzegovina	16.1	15.2	Mauritius	55.8	61.1
Lebanon	15.2	13.1	Kiribati	55.8	70.0
Portugal	14.6	13.6	Sierra Leone	49.2	72.2
Croatia	14.0	13.1	Ghana	44.6	57.4
Dominican Republic	13.6	15.5	Liberia	44.3	61.2
Tuvalu	13.4	14.8	Lebanon	43.8	46.9
New Zealand	12.8	12.2	Marshall Islands	42.8	49.2

NOTE: Emigrants aged 25+ as proportion of the population 25+ born in the source country in the same gender and education group (see Equation 1).

one), revealing that small countries are relatively more affected by emigration than large countries. The five largest diasporas (ages 25+ from all education categories) originate from Mexico (6.4 million), the United Kingdom (3.0 million), Italy (2.3 million), Germany (2.3 million), and Turkey (1.9 million). Eight other countries have diasporas exceeding 1 million: India, the Philippines, China, Vietnam, Portugal, Korea, Poland, and Morocco. In most of these countries, women's share varies from 48 to 52 percent. However, women's share is particularly high for the Philippines (62 percent), Germany (57), Korea, and Poland (both around 56 percent).

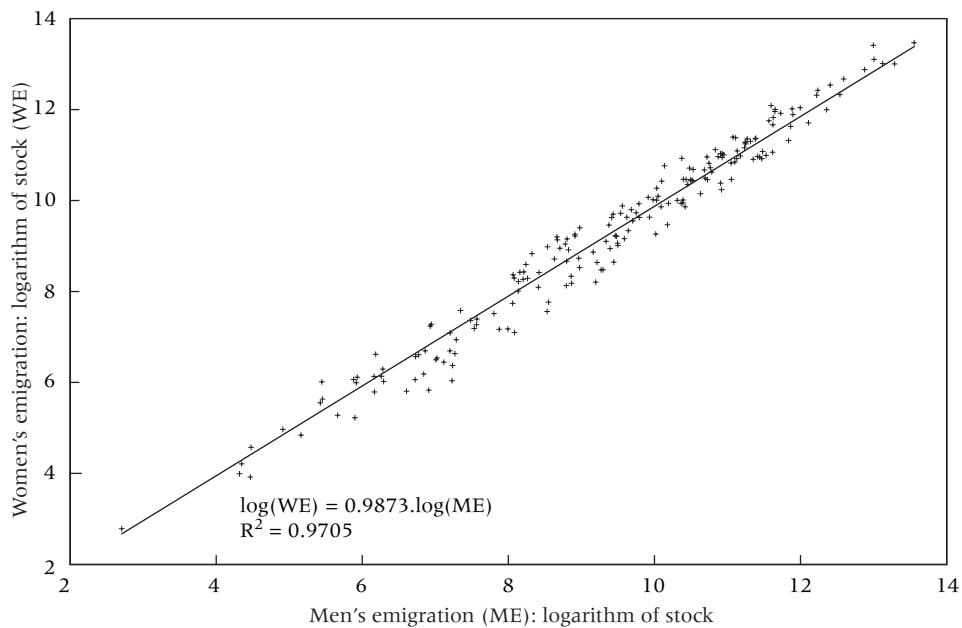
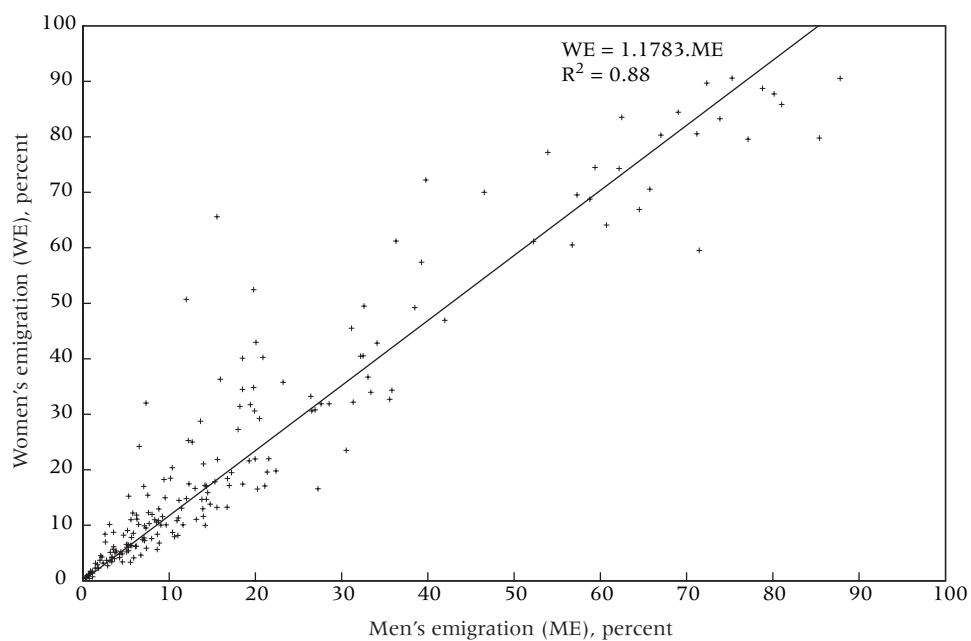
Focusing on highly skilled emigrants, the ranking unsurprisingly shows that rich countries with highly educated populations have better-educated diasporas. The elasticity of highly skilled emigration to population size at origin amounts to 0.66. The largest highly skilled diasporas originate from the United Kingdom (1.5 million), the Philippines (1.1 million), and India (1.0 million). Mexico and Germany send more than 0.9 million highly skilled natives abroad. Four other countries have highly skilled diasporas above 0.5 million: China, Korea, Canada, and Vietnam. In these top-30 countries, the share of women among highly skilled migrants is large in Jamaica (62 percent), the Philippines (60), as well as Japan, Russia, Ukraine, Poland, and Colombia.

The right-most panel of Table 3 shows the 30 countries with the largest highly skilled migration rates in 2000. Small islands lead the list. The emigration rate exceeds 80 percent in countries such as Guyana, Jamaica, St. Vincent, Grenada, Haiti, Cape Verde, and Palau. Only three of these top-30 countries have a population above 4 million. After eliminating small countries with fewer than 4 million inhabitants, about one-third of the most-affected countries are located in sub-Saharan Africa and seven are in Central America and the Caribbean. The highly skilled emigration rate in these 4 million plus population-size countries exceeds 30 percent in nine countries, including five in sub-Saharan Africa.

Gender gap in highly skilled migration

Figures 1 and 2 compare stocks and rates of highly skilled migration by gender. Figure 1 shows that the correlation between males and females in stocks is extremely high (97 percent). This is mainly due to an important size effect in international migration stocks: large countries send larger numbers of both men and women abroad than small countries. On average, the number of highly skilled female migrants is slightly lower than the number of highly skilled males. About 61 percent of developing countries (and only 48 percent of developed countries) send more male than female skilled migrants.

As we argued above, a more meaningful measure of the gender gap can be obtained by controlling for the total number of persons born in the source country who belong to the same gender and educational category (in this case focusing on highly skilled emigration rates). Figure 2 reveals that the correla-

FIGURE 1 Stocks of highly skilled emigrants in 195 countries in 2000: Correlation between women and men**FIGURE 2** Rates of emigration in 195 countries in 2000: Correlation between women and men

tion between gendered rates (88 percent) is lower than between gendered stocks (97 percent) and that women's highly skilled emigration rate is on average 17 percent above men's. This confirms the results presented in Docquier, Lohest, and Marfouk (2007), who provide a simple multiplicative decomposition of the highly skilled emigration rate into two components: degree of openness of sending countries (as measured by the average of educational categories or total emigration rate) and the schooling gap (as measured by the education level of emigrants compared with the native-born population).

Conclusion

Women's essential contributions to economic development have been duly noted, but their unique roles in international migration have received attention only more recently. In its *World Survey on the Role of Women in Development*, the United Nations stated that a gender perspective is essential to understanding migration and development.¹⁹ The report states that a dearth of data has made it difficult to evaluate the full implications of female migration. This article presented data based on information relating to 195 countries to improve understanding of the role of women in highly skilled international migration.

We built on the DM06 data set, updated the statistics using new sources, standardized 1990 and 2000 categories, and introduced a breakdown by gender. We provided revised stocks and rates of emigration by level of schooling and gender. Although our data set would benefit from extensions (e.g., adding points in time and accounting for migration to non-OECD destination countries), it can be used to illustrate the recent trend in women's highly skilled emigration, as well as to analyze its causes and consequences for developing countries.

Our gross data reveal that the share of women in the highly skilled immigrant population increased in almost all OECD destination countries between 1990 and 2000. Consequently, for the vast majority of source regions, the growth rates of highly skilled women emigrants have exceeded the growth rates for low-skilled women or highly skilled men. This evolution is particularly pronounced in the least developed countries. The increased participation of women in South-to-North emigration partly reflects gendered changes in the supply of education. On average, women's highly skilled emigration rate is 17 percent above men's. Our database makes it possible to investigate the causal links between these variables and to analyze the consequences and determinants of women's skilled migration.

Appendix

In countries where population registers are used (mainly the Scandinavian countries), data are based on the whole population. In countries where census data are used, statistics are based either on the whole population (e.g., Australia, New Zealand, Bel-

gium) or on a sample thereof (e.g., 25 percent in France). In some cases, we combine comprehensive register data on the numbers of adult males and females, but use sample data to estimate the educational structure (the UK is estimated on 10 percent of the population; in Germany, the microcensus is based on 1 percent of the population). The education structure is sometimes given by region or groups of countries; we then assume a constant share within the region. In a couple of countries, we use household and labor force surveys to estimate the educational structure. Finally, we also use the IPUMS International data set for Mexico, Spain, and the United States.

APPENDIX TABLE A1 Data sources

Receiving country	Definition	1990	2000
Australia	Foreign born	Australian Bureau of Statistics	Australian Bureau of Statistics
Austria	Foreign born	Statistik Austria	Statistik Austria
Belgium	Foreign born	Institut National de Statistiques	Institut National de Statistiques
Canada	Foreign born	Statistics Canada	Statistics Canada
Czech Republic	Foreign born	Estimates (a)	Czech Statistical Office
Denmark	Foreign born	Statistics Denmark	Statistics Denmark
Finland	Foreign born	Statistics Finland	Statistics Finland
France	Foreign born	INSEE	INSEE
Germany	Foreign citizens	Microcensus + Federal Statistical Office	Microcensus + Federal Statistical Office
Greece	Foreign born	Estimates (a)	National Statistical Service of Greece
Hungary	Foreign citizens	Estimates (a)	IPUMS-International
Iceland	Foreign born	Statistics Iceland + estimates (b)	Statistics Iceland + estimates (b)
Ireland	Foreign born	Central Statistics Office Ireland	Central Statistics Office Ireland
Italy	Foreign citizens	Estimates (a)	Istituto Nazionale di Statistica
Japan	Foreign citizens	Statistics Japan + estimates	Statistics Japan + estimates
Korea	Foreign citizens	Statistics Korea + estimates	Statistics Korea + estimates
Luxembourg	Foreign born	STATEC Luxembourg	STATEC Luxembourg
Mexico	Foreign born	IPUMS-International	IPUMS-International
Netherlands	Foreign born	Statistics Netherlands + estimates (b)	Statistics Netherlands + estimates (b)
New Zealand	Foreign born	Statistics New Zealand	Statistics New Zealand
Norway	Foreign born	Statistics Norway	Statistics Norway
Poland	Foreign born	Estimates (a)	Poland Statistics
Portugal	Foreign born	Instituto Nacional de Estatística	Instituto Nacional de Estatística
Slovakia	Foreign born	Statistical Office of the Slovak Republic	Statistical Office of Slovakia
Spain	Foreign born	Estimates (b)	IPUMS-International
Sweden	Foreign born	Statistics Sweden	Statistics Sweden
Switzerland	Foreign born	Swiss Statistics	Swiss Statistics
Turkey	Foreign born	Turkish Statistical Institute	Turkish Statistical Institute
United Kingdom	Foreign born	Office for National Statistics	Office for National Statistics
United States	Foreign born	Bureau of Census + IPUMS	Bureau of Census + IPUMS

(a) Immigration stocks are estimated using the SOPEMI data set by country of citizenship.

(b) Immigration stocks are estimated using the United Nations Population Division data set.

(a), (b) Education levels are estimated using the average changes observed in other OECD countries.

Notes

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1 See Commander et al. (2004) and Docquier and Rapoport (2009) for literature surveys.

2 See Docquier et al. (2007), Beine et al. (2008), Checchi et al. (2007), Kugler and Rapoport (2007), Nimii and Ozden (2006), Javorcik et al. (2006), Grogger and Hanson (2008), Easterly and Nyarko (2005).

3 The "non-economic" literature on the migration of women (mainly based on case studies) has increased since the early 1990s. See, among others, Buijs (1993), Hondagneu-Sotelo (1994), United Nations (1994), Zlotnik (1990, 1995), Sweetman (1998), Cerrutti and Massey (2001), Morrison et al. (2007)

4 In developing countries, the share of women has been relatively stable over time.

5 In the same vein, Klasen (1999) and Dollar and Gatti (1999) demonstrated in cross-country regressions that gender inequality is a significant constraint on growth, a result confirmed by Blackden et al. (2006) in the case of sub-Saharan Africa.

6 Regressing corrected rates on uncorrected rates gives an R^2 of 0.978, 0.990, and 0.997 for emigrants leaving at ages 22, 18, and 12 years.

7 Hatton and Williamson (2002) estimate that illegal immigrants residing in OECD countries represent 10 to 15 percent of the total immigrant stock.

8 By contrast, in other OECD countries with restricted access to citizenship (such as Japan, Korea, and Switzerland), the foreign-

born population is substantial (about 20 percent in Switzerland).

9 OECD statistics indicate that 14.4 million foreign-born individuals were naturalized between 1991 and 2000. Countries with particularly high numbers of acquisitions of citizenship are the United States (5.6 million), Germany (2.2 million), Canada (1.6 million), and Australia and France (1.1 million each).

10 See column 2 in Appendix Table A1.

11 For example, the US Census Bureau considers as natives persons born in the United States, Puerto Rico, or US island areas, or persons born abroad to a US citizen parent or parents (see Malone et al. 2003). France and Denmark use a similar approach. Statistics Netherlands defines first-generation immigrants as persons who are born abroad and have at least one parent who was also born abroad (Alders 2001).

12 In the United States, this includes persons with at least one year of college.

13 Country-level data reveal that the occupational structure of persons with unknown level of education is very similar to the occupational structure of low-skilled workers (and substantially different from that of highly skilled workers). See Debuisson et al. (2004) on data for Belgium.

14 For example, Australian data mix information about the highest degree and the number of years of schooling.

15 See «<http://esa.un.org/unpp>».

16 See «<http://www.cia.gov/cia/publications/factbook>».

17 The share of women in the highly skilled immigrant population amounts to 50 percent in the United Kingdom, 50 in the United States, 48 in Canada, 47 in France, and 45 in Germany.

18 Our cross-country results are very similar to those described in Docquier and Marfouk (2006). The correlation between the 1990 and 2000 skilled emigration rates is 94 percent.

19 See United Nations (2006).

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A Gendered Assessment of Highly Skilled Emigration

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Although women form a large and increasing proportion of international migrants, women's mobility has generally been overlooked in the literature. Quantifying and characterizing female migration should lead to a better understanding of the forces that shape international migration. We build an original data set providing gender-disaggregated indicators of international migration by educational attainment for 195 source countries in 1990 and 2000. We find that women represent an increasing share of the immigration stock in the OECD countries and they exhibit higher skilled emigration rates than men.

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