

International Skilled Migration: The Caribbean Experience in Perspective

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ABSTRACT

While migration is not a new phenomenon, the sustained increase in the remittance flows associated with it has contributed to raise awareness on its dimension. Caribbean countries show a very distinctive pattern of migration with high skilled migration rates unmatched by low-skilled migration. This paper proposes an analysis of the characteristics of Caribbean skilled migration, in the context of global international trends. Moreover, it examines the main factors determining skilled and unskilled migration, the potential implications for origin countries and the relevant policy options.

Francesca Castellani
InterAmerican Development Bank
1300 New York Ave, NW
Washington DC 20577
Tel. 202 623 1673
Fax. 202 623 2351
Email: francescac@iadb.org

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International Skilled Migration: The Caribbean Experience in Perspective

“When human capital exits at high rates, this is invariably a signal of deep and significant problems in the country. In such cases, tackling the brain drain would simply be treating the symptoms of the problems rather than its root causes”.

Kapur and McHale, 2005.

I. Introduction

While migration is not a new phenomenon, the sustained increase in the remittance flows associated with it has contributed to raise awareness on its dimension. Remittances, estimated by the World Bank at \$167 billion in 2005, equivalent to 1.8% of developing countries' GDP, have outgrown aid, FDI and capital flows and shown a higher resilience to macroeconomic conditions. As a result, they have generally been perceived as an opportunity for sending countries¹. Moreover, evidence that other financing flows have generally been pro-cyclical and directly related to the sound macroeconomic management of receiving countries has further strengthened this view. While, one might debate their appropriateness as alternative sources of financing, concerns arise as to the generalized perception that remittances bear no costs.

The strong relationship between remittance and emigration flows has stimulated further research on their potential implications for origin countries. Increasing attention has been drawn to skilled migration, the most likely to hinder human capital accumulation, give rise to externalities and deteriorate growth and development prospects. So, while migration might constitute an opportunity from a private perspective, it is less clearly so from a country standpoint as it might result in a *brain drain*.²

While earlier contributions to economic literature have underscored the negative implications of skilled migration, recent research, more optimistically, has emphasized the positive effect of migration and higher wage expectations on human capital accumulation. As migration opportunities will not completely match the larger supply of skills, this would give rise to domestic skill accumulation in the longer run. The availability of reliable information and, in particular, the lack of migration statistics in origin countries, has limited the possibility to consistently assess the extent of skilled migration, examine trends and eventually devise policies to minimize its costs and maximize gains.³ The debate on the prevalence of the brain drain and gain effect and more broadly, on the convergence or divergence hypothesis between sending and recipient countries is still open and extremely relevant for several developing countries. In 2000,

¹ See IMF 2005.

² Chiswick (2001). *“In the post WWII period this migration was referred to as the “brain drain” (Adams 1968). It was so labeled because the source countries provided the training, often at the tertiary level, for high ability individuals who subsequently left the country and, it was presumed, they would not return. The loss of this high level human capital was viewed as a subsidy by the developing world to the advanced economies and the loss of this technology, innovation and entrepreneurial talent retarded economy development, both directly and indirectly through discouraging investment of physical capital in the local economy”.*

³ Recent database includes information from destination country sources (i.e. national census)

the Caribbean region accounted for 6% of the total OECD migrant stock (59 million) and presented the highest skilled migration rates in the world.^{4,5}

This paper proposes an analysis of the characteristics of Caribbean migration, in the context of global international trends, with particular emphasis on skilled migration. Moreover, it examines (i) the main factors determining skilled and unskilled migration, (ii) its potential implications for origin countries and (iii) the relevant policy options.

II. International Migration. Stylized facts

1. Global trends

In 2000, OECD countries⁶ were hosting 59 million migrants, across all educational level, equivalent to 5.2% of their total population, with a 41% cumulative increase since 1990 (Table 1).⁷ Migration from Latin America and the Caribbean (LAC) represented around 25% of the total stock. In cross-region comparison, LAC shows the most significant surge (91%) over the decade, which almost leads to match Asian presence.

Table 1. Growth rates of migrant stock in OECD countries by area of origin

| <i>thousands</i> | TOTAL STOCK | LAC* | AFR* | ASIA | EU/NA⁸ | OCEA* |
|-------------------------------|--------------------|-------------|-------------|-------------|--------------------------|--------------|
| 1990 | 41,845 | 7,264 | 2,911 | 9,504 | 17,356 | 534 |
| 2000 | 59,022 | 13,881 | 4,497 | 15,043 | 22,731 | 809 |
| Overall growth rate 1990-2000 | 41.0% | 91.1% | 54.5% | 58.3% | 21.5% | 51.4% |
| Average annual growth rate | 3.5% | 6.7% | 4.4% | 4.7% | 0.2% | 4.2% |

*LAC=Latin America and the Caribbean; AFR=Africa; EU/NA=Europe and North America; OCEA=Oceania
Source: own elaboration based on DM database and UN data.

The importance of these figures is better gauged when scaled in terms of world population. In 2000, LAC and Oceania accounted for 8.6% and 0.5% of world population respectively, vis-à-vis a share of Asia and Africa of 61% and 13%, respectively. Figure 1 shows regions' contribution to

⁴ Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Korea, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Spain, Sweden, Switzerland, Turkey, United Kingdom and United States

⁵ The Caribbean region is defined as CARICOM countries (Antigua and Barbuda, Bahamas, The Barbados, Belize, Grenada, Guyana, Haiti, Jamaica Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Suriname, Trinidad and Tobago) and Cuba, Dominica, Dominican Republic.

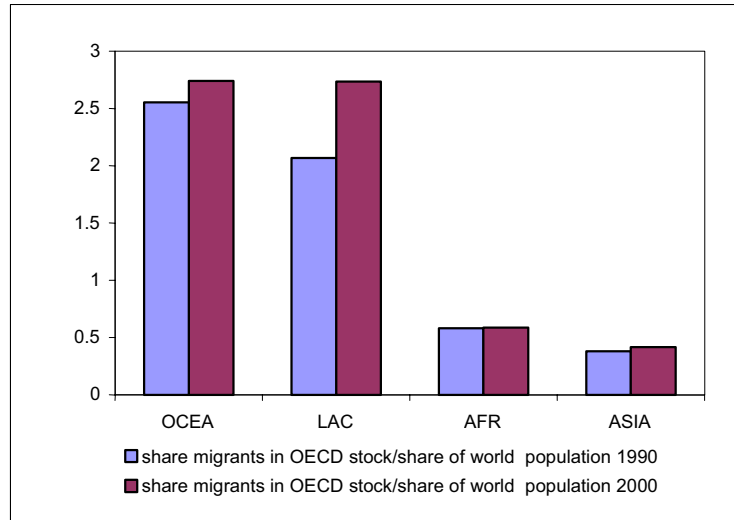
⁶ Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Korea, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Spain, Sweden, Switzerland, Turkey, United Kingdom and United States

⁷ The database by Docquier and Marfouk (2005a) (henceforth DM database) provides information on migrants stocks in OECD countries (destination countries), originating from 192 countries and 39 dependent territories (source countries). Data (legal migration) are collected from OECD censuses and classified by educational attainment, source and destination country.

⁸ North America includes USA, Canada and Mexico.

OECD migrant stock as a proportion of their contribution to world population.⁹ LAC is contributing more than proportionally (i.e., 2.5 times) and, increasingly so, since 1990.

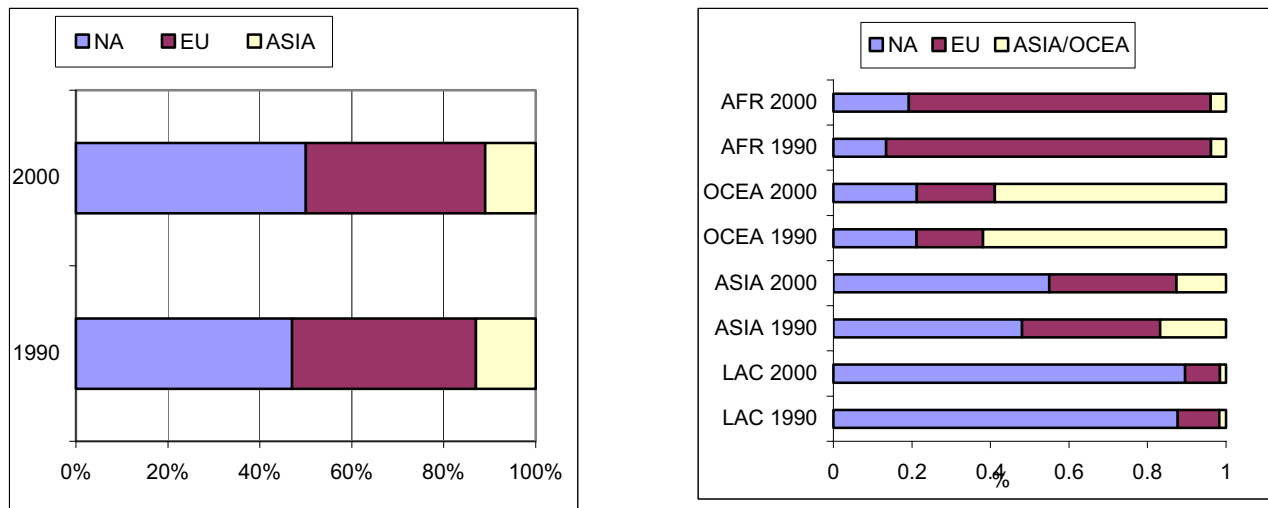
Figure 1. Contribution to OECD migration as % of contribution to world population



Source: own elaboration based on DM database and UN data

Differences in stock distribution are offset by a generalized preference for North America (NA), which in 2000 was hosting 47% of the total stock.¹⁰ While for LAC and ASIA this preference is stable over time, Africa migrants, whose majority (80%) lives in Europe, show an increasing tendency to settle in NA (Figure 2).

Figure 2. Stock distribution per destination area



Source: own elaboration based on DM.

⁹ Ratios higher (lower) than 1 indicate a more (less) than proportional contribution.

¹⁰ Mexican migration help explain these results.

LAC shows the strongest concentration across regions with 90% of all migrant workers residing in NA (in 2000). Still, sub-regions present diverse situations, with Central America and the Caribbean confirming the regional trend, with over 95% of migrants residing in NA, and South America with an important presence of migrants in Europe.¹¹ Hatton et al. (2004), illustrating the evolution in the composition of US immigration between 1950 and 2000, calculate an increase in the share of LAC workers among migrants from 22.2% to 47%.

Aggregate data, presented so far, conceal the heterogeneity of skills possessed by migrant workers. The breakdown by educational attainment helps highlight the increasing importance of skilled migration experienced by developing countries (Table 2). In the decade considered, the stock of tertiary educated migrants increased by over 60% and its share of the total stock reached 35%.

Table 2. Growth rates of migrant stock by educational attainment (1990-2000) ¹²

| <i>thousands</i> | TOTAL STOCK | LOW | MEDIUM | HIGH |
|----------------------------|--------------------|------------|---------------|-------------|
| 1990 | 41,845 | 18,804 | 10,579 | 12,462 |
| 2000 | 59,022 | 21,512 | 17,107 | 20,403 |
| Overall growth rate | 41.0% | 14.4% | 61.7% | 63.7% |
| Average annual growth rate | 3.5% | 1.4% | 4.9% | 5.1% |

All regions experienced important increases but Africa and LAC show the highest annual growth rates in higher skilled migration (Table 3).

Table 3. Growth rates of migrant stock by educational attainment (1990-2000)

| <i>%</i> | LOW | MEDIUM | HIGH | TOTAL |
|-------------|------------|---------------|-------------|--------------|
| LAC | 5.4 | 9.2 | 7.0 | 7.1 |
| ASIA | 2.2 | 5.8 | 6.3 | 4.7 |
| AFR | 1.2 | 10.9 | 7.8 | 4.4 |
| OCEA | 0.1 | 5.5 | 5.4 | 4.2 |

Medium and skilled workers concentrate in NA (60% of stock) and low skilled in EU. In 2000, 90% of LAC skilled workers lived in NA, compared to 60% for Asia and 33% for Africa. This concentration can be partly attributed to skilled-targeted migration policies put in place overtime by Canada and United States to stimulate access, based on skills.^{13,14}

¹¹ In 2000, more than 25% of migrants from Argentina, Chile, Uruguay and Venezuela were living in Europe.

¹² Migrants are defined as working-aged (older than 25 years) foreign-born individuals (exclusion of foreign students). As to educational attainment, it distinguishes primary education (0 -8 years of education); secondary education (9-12 years of education) and tertiary education (more than 13 years of education).

¹³ Canada adopted a point system in 1965, allowing for greater weight being given to the skill component. Australia and New Zealand also shifted to more skilled-friendly policy. The 1990 Immigration Act of the United States introduced a new system of preferences that allocated a larger share of available visa by occupational attributes rather than by family reunification.

While stock growth rates are useful to assess the pace of migration, the DM database includes migration rates to gauge its impact on the pool of skills produced by the country.¹⁵ Migration rates, defined as the stock of migrants as a proportion of the total stock of people born in the country with the same educational level, reveal potential skill shortages in origin countries. As population size determines skill supply, smaller countries are most likely to face shortages than larger ones as a result of migration. Table 4 presents (weighted) average rates for cross-regional comparison.

Table 4. Migration rates by educational attainment and by origin in 2000*

| | Low | Medium | High | Total |
|------|------|--------|-------|-------|
| LAC | 2.8% | 9.4% | 11.0% | 5.3% |
| AFR | 0.9% | 1.8% | 10.4% | 1.5% |
| OCEA | 2.3% | 4.2% | 6.8% | 4.3% |
| ASIA | 0.4% | 0.6% | 5.5% | 0.8% |

Source: own elaboration based on DM database and UN data.

* Weighted averages

LAC presents the highest rates across all educational attainment: 11 out of 100 workers with tertiary education lived outside the region. The indicators presented, calculated as weighted averages, conceal cross-country variation, as Brazil, Argentina and Chile present tertiary migration rates ranging between 2% and 3%, and the Caribbean exceed 40%.¹⁶

2. The case of the Caribbean

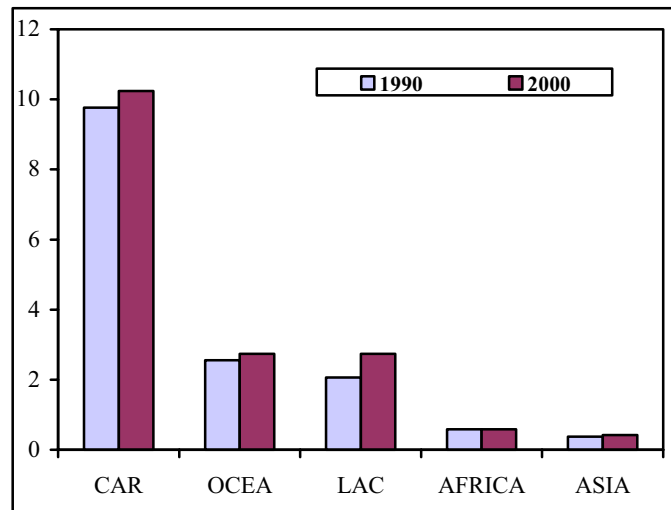
The evidence presented above points at the important migration experienced by LAC. This section considers the case of the Caribbean countries and their distinct migration patterns, which deserve make them a special position in LAC and in the world. In 2000, Caribbean migration represented 6% of the total OECD stock, in spite of a 0.6% world population share, implying a contribution to almost 10 times higher than its share of world population (Figure 3).

¹⁴ Europe is at present considering the introduction of more selective migration policies. Chiswick et al. (2002) review the evolution of OECD migration policies, pointing at the political and economic factors that determined policy shifts over time.

¹⁵ Gross migration rates do not consider return migration. See Rosenzweig (2005) for a detailed discussion of methodological issues and the upward bias of these indicators.

¹⁶ The Caribbean face the most severe brain drain with an average migration rate of 45%, followed by Eastern Africa (19%), Middle Africa (16%) and Central America (17%).

Figure 3. Regional contribution to OECD Migration as % of contribution to world population



Source: own elaboration based on DM database and UN data.
* See also Figure 1 for comparison.

This entails that, in terms of residing population, estimated at 35 million in 2000, 10% was living outside the region, with Cuban, Jamaican, Dominican and Haitian accounting for more than 70% of the total stock originating from the region (Table 5).

Table 5. Growth rates of migrant stock from Caribbean countries

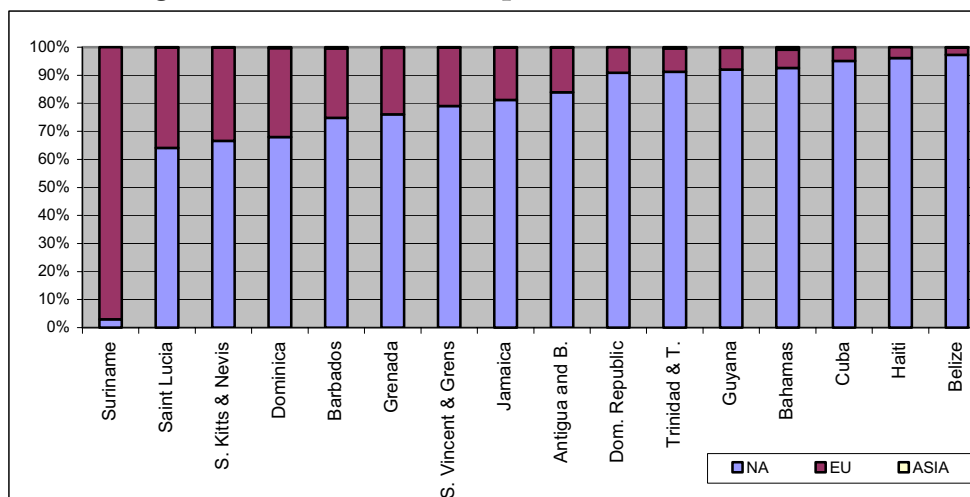
| | Migrant Stock 1990 | Migrant Stock 2000 | Average annual growth (%) 1990-2000 * | Migrant Stock as % resident population (2000) |
|---------------------|--------------------|--------------------|---------------------------------------|---|
| Antigua & Barbuda | 12,985 | 21,410 | 5.1 | 29.6 |
| Bahamas, The | 14,108 | 21,208 | 4.2 | 7.0 |
| Barbados | 68,740 | 80,792 | 1.6 | 30.3 |
| Belize | 25,301 | 38,345 | 4.2 | 15.4 |
| Cuba | 704,226 | 862,890 | 2.1 | 7.7 |
| Dominica | 19,367 | 22,217 | 1.4 | 31.1 |
| Dominican Republic | 258,810 | 585,435 | 8.5 | 7.0 |
| Grenada | 24,772 | 38,896 | 4.6 | 38.4 |
| Guyana | 151,302 | 267,346 | 5.9 | 35.2 |
| Haiti | 205,510 | 391,491 | 6.7 | 4.9 |
| Jamaica | 456,526 | 681,049 | 4.1 | 26.4 |
| Saint Kitts & Nevis | 12,159 | 18,062 | 4.0 | 40.8 |
| Saint Lucia | 13,487 | 21,015 | 4.5 | 13.5 |
| Saint Vincent | 18,203 | 31,047 | 5.5 | 27.7 |
| Suriname | 133,864 | 180,156 | 3.0 | 42.4 |
| Trinidad & Tobago | 146,558 | 235,773 | 4.9 | 18.3 |
| Total | 2,265,919 | 3,497,132 | 4.4 | 10.3 |

Source: own elaboration based on DM database and UN data. * See also table 1 for comparison.

Besides high annual growth rates (4.4%), concentration by (i) destination and (ii) skills characterize Caribbean migration: its.

With the exception of Suriname,¹⁷ with 97% of migrants residing in Europe, on average 90% of Caribbean migrants was living in NA in 2000, twice as much as the global trend (47%).¹⁸

Figure 3. Stock distribution per destination area (2000)*



Source: DM database. * See Table 1 for comparison.

An unparalleled feature of the Caribbean migration is the importance of its skilled migration, which accounted for 6% of total skilled stock in OECD and 9.2% of the one residing in NA (2000). In contrast with other LAC countries, which generally experience a positive growth rate across all schooling levels, the Caribbean record low growth in unskilled and strong growth in skilled migration as shown in Table 6.¹⁹

Table 6. Growth rates of migrant stock by educational attainment*

| <i>Annual average growth rate 1990-2000</i> | Low | Medium | High | Total |
|---|-------------|---------------|-------------|--------------|
| Antigua & Barbuda | -1.3% | 4.3% | 8.9% | 5.1% |
| Bahamas, The | -2.8% | 2.9% | 7.6% | 4.2% |
| Barbados | -4.0% | 3.2% | 4.0% | 1.6% |
| Belize | 1.4% | 4.0% | 5.9% | 4.2% |
| Cuba | -1.6% | 3.4% | 3.2% | 2.1% |
| Dominica | -4.7% | 3.5% | 6.0% | 1.4% |
| Dominican Republic | 6.1% | 9.5% | 10.4% | 8.5% |
| Grenada | 0.0% | 6.8% | 5.8% | 4.6% |
| Guyana | 2.1% | 7.8% | 6.2% | 5.9% |
| Haiti | 4.1% | 7.5% | 7.3% | 6.7% |
| Jamaica | -1.6% | 6.0% | 6.4% | 4.1% |
| S. Kitts & Nevis | -1.6% | 5.4% | 7.0% | 4.0% |
| Saint Lucia | -0.9% | 7.5% | 6.9% | 4.5% |
| Saint Vincent & Grens | -0.4% | 7.9% | 7.6% | 5.5% |
| Suriname | 0.0% | 10.6% | 4.4% | 3.0% |
| Trinidad & Tobago | 0.7% | 5.9% | 5.5% | 4.9% |
| Total | 0.6% | 6.1% | 5.8% | 4.4% |

Source: own elaboration based on DM database. * See Table 2 for comparison.

¹⁷ Suriname became independent from the Netherlands in 1975.

¹⁸ Only Central American countries show higher concentration (above 95%).

¹⁹ Only Panama, Argentina, Uruguay and Venezuela show negative growth rate for the stock of low skilled migrants.

Migration is increasingly skewed towards higher skills as the stock of medium and high skilled workers grew at an average annual growth rate of 6%, above the one for the total OECD stock (5.1%), and almost half of tertiary educated workers migrated, equivalent to four times the LAC average..

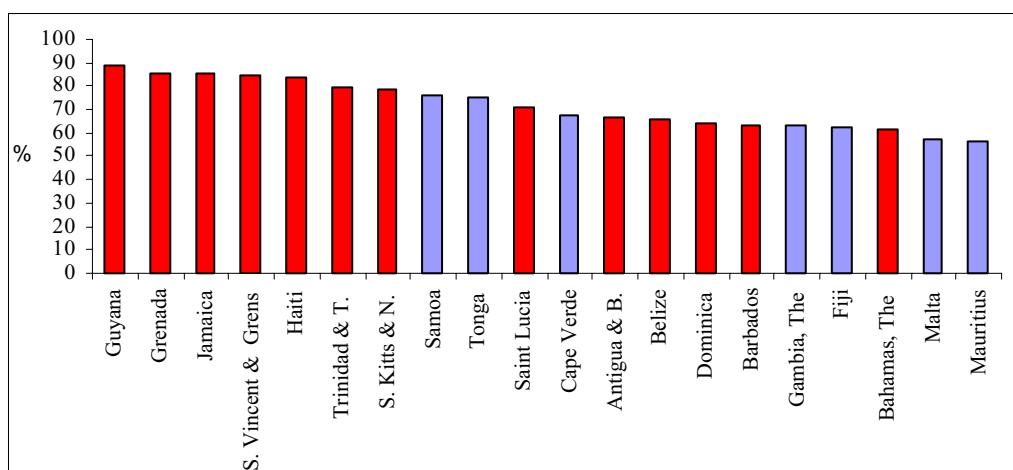
Table 7. Migration rates by educational attainment (2000)

| | Low | Medium | High | Total |
|-----------------------|-----------|------------|------------|------------|
| Guyana | 18% | 43% | 89% | 42% |
| Grenada | 25% | 71% | 85% | 54% |
| Jamaica | 16% | 35% | 85% | 35% |
| S.Vincent & the Grens | 18% | 33% | 85% | 37% |
| Haiti | 3% | 30% | 84% | 12% |
| Trinidad and Tobago | 8% | 22% | 79% | 25% |
| Saint Kitts and Nevis | 32% | 42% | 78% | 49% |
| Saint Lucia | 12% | 21% | 71% | 23% |
| Antigua and Barbuda | 9% | 64% | 67% | 38% |
| Belize | 7% | 58% | 65% | 29% |
| Dominica | 19% | 67% | 64% | 41% |
| Barbados | 18% | 28% | 63% | 32% |
| Bahamas, The | 3% | 10% | 61% | 12% |
| Suriname | 39% | 74% | 48% | 47% |
| Cuba | 5% | 10% | 29% | 11% |
| Dominican Republic | 6% | 33% | 22% | 13% |
| Total | 7% | 21% | 45% | 17% |

Source: DM database 2005. * See Table 4 for comparison.

Figure 5 shows that 13 Caribbean countries are ranked among the 20 countries with the highest skilled migration rates and seven occupy the first positions, with Guyana, Grenada, Jamaica, St. Vincent and Haiti featuring rates above 80%.

Figure 5. Top 20 countries with the highest skilled migration rate in 2000



Source: DM database.

It is important to note that the countries depicted in Figure 5 share common features: small size and the fact of being island economies.²⁰ The reduced pool of high skills generated by these countries, due to their limited population size, contributes to the high migration rates. Small islands tend to be more open to migration. Some authors call upon the size of the economy in terms of scarce employment opportunities as an important determinant of migration decisions.²¹

Besides international flows, Caribbean migration has also been characterized by important intra-regional flows.²² The economic performance of destination countries has generally determined the preferred destinations. So, the thriving of the tourism in Barbados and Bahamas, and oil sector in Trinidad have led these countries to record migration inflows from the region.²³

As outlined, the Caribbean region shows a very unique migration pattern, recording high skilled migration rates unmatched by unskilled ones. The next section tries to shed some light on the drivers of skilled and unskilled migration.

III. Schooling matters: explaining international migration

Based on the stylized facts presented, this section investigates the determinants of international migration, discriminating across educational levels. The analysis developed here (i) combines traditional explanatory variables (per capita income, distance, population size, distance, language) with policy and institutional variables (risk, taxation policy, credit availability to the private sector, cost of doing business); and (iii) differentiates across skills. Existing literature has highlighted the importance of economic, geographic and demographic factors in migration decision and used both cross-section (Borjas 1987, Yang 1995) and panel data (Karemera et al., 2000, Clark et al. 2003, 2004).

Its contribution is thus twofold. The use of a complementary set of variables to the ones traditionally considered in the literature allows capturing the impact of policy-making by national authorities on migration incentives and identifying potential instruments to influence flows. In particular, taxation policy, country risk and business climate indicators are included to take into account their effect on disposable income and, more generally, on investment and employment opportunities.²⁴ Furthermore, the possibility to investigate the impact of policy variables on migration decision across educational attainments provides insights on the appropriateness of a “one-size fits-all” approach.

The findings are in line with existing literature, confirming that both income and gravity variables as important determinants of migration choices.²⁵

²⁰ The Gambia and Belize are the only exceptions.

²¹ Thomas-Hope (1993) *“Societies of small islands develop either a sense of self-sufficiency or a sense of the need to establish linkages and expand their limited space. Migration, and through this, the establishment of transnational communities, has been the chief way in which Caribbean people have been able to incorporate other places and extend their environments of opportunity beyond the physical limitations and societal constraints of their small islands.”*

²² See Pizarro (2005) for more details.

²³ On January 1, 2006 the Caribbean Single Market and Economy (CSME) was launched. To date only six of the 15 members of the Caribbean Community (CARICOM) participate in the CSME. This initiative implies freedom of movement for goods, services, capital and skilled workers between Barbados, Belize, Guyana, Jamaica, Suriname and Trinidad and Tobago. This is likely to lead to more important regional flows in the future, though the signatories will need to put in place the domestic measure to comply with the CSME.

²⁴ The resort to these variables is consistent with conventional specifications.

²⁵ See Clark et al. (2004) for a literature review.

Estimations are based on the following specification:

$$M_{j,t}^{H,S} = \beta_0 + \beta_1 \log YPC_j + \beta_2 \log risk_j + \beta_3 tax_j + \beta_4 tax_j^2 + \beta_5 \log pop_j + \beta_6 \log dis_j^H + \beta_7 lang_j + \beta_8 cred_j + \beta_9 bco_j + \beta_{10} d_{CAR} + \beta_{11} d_{ASIA} + \beta_{12} d_{AFR} + \varepsilon_j \quad (1)$$

The dependent variable is the emigration rate from country j to the destination area, H ,²⁶ defined as the stock of migrants as a proportion of the stock of people born in the source country, at time t , with the same educational attainment, S . As indicated above, this indicator proxies skill shortage as a higher migration rate would result in a lower availability of skills at home. Estimations will consider high and low skilled migration. Analysis presented here considers global (i.e. to OECD) migration rates. Appendix 1 provides results for skilled and unskilled migration to North America and Europe, taking into account regional distributions of skills.

The explanatory variables include both economic and geographic factors, proxying both incentives and costs. The first variable, the income per capita in source country j (purchasing power parity adjusted), is expected to have a negative impact on migration, given that better economic conditions at home are likely to reduce incentives to leave, $\beta_1 < 0$. The composite country risk indicator includes economic, political and financial risk and is expected to have a negative sign, as a more stable environment at home might induce people to stay, $\beta_2 < 0$. The third and fourth variables are respectively the marginal income taxation scores and its squared value. As taxes directly affect disposable income, the indicator, which gives higher score to higher rates, is expected to have a positive but decreasing impact, $\beta_3 > 0$ $\beta_4 < 0$.²⁷

Population is introduced to control for country size and, given that a larger population would contribute to enhance production and employment alternatives, is expected to have a negative sign, as $\beta_5 < 0$.²⁸ Smaller states are generally undiversified in their production and export base and this translates in reduced opportunities for workers' turnover. Moreover, it is more likely that, in smaller states, limited financial resources might constraint compensation levels, efficient training and the quality of working environment, thus contributing to migration.²⁹

Distance between capital cities and language barriers proxy migration costs. Smaller distances and ability to speak English (the dummy is 1 for English speakers) are also expected to encourage migration, therefore $\beta_6 < 0$ and $\beta_7 > 0$.

Availability of credit to private sector and the cost of doing business for foreign investors reflect the business climate conditions in the source country. A more favorable environment (i.e. better access to credit and lower costs of doing business) is expected to mitigate migration incentives

²⁶ The use of stock data, because of the lack of availability of flows provides a second-best option, given that the migrant stocks would also be the result of past policies. This implies that the estimation should consider explanatory variables for several years.

²⁷ See Bagwhati (1982) and Kapur and McHale (2005).

²⁸ The use of population as a proxy of the size of the economy, because of the lack of good instrumental variables, introduces a potential endogeneity problem. The correlation across variables is lower than 0.8.

²⁹ Commonwealth Secretariat/World Bank Joint Task Force on Small States (2000), "Small States Small States: Meeting Challenges in the Global Economy".

($\beta_8 < 0$; $\beta_9 > 0$). Besides creating incentives to stay, greater credit availability might also contribute to reduce migration costs (i.e. lowering education costs and affecting the ability to acquire skills) and lead to higher migration rates ($\beta_8 > 0$). Regional dummies are also included to test their relevance and the contribution of fundamentals in explaining regional differences.

Selective immigration policies by host countries are not considered in the model specification but they are proved to be important determinants of migration (Clark et al. 2003, 2004).

1. Results

The specification described above is estimated on cross-country data for migration rates calculated on the basis of the DM database. Data are collected from the World Development Indicators of the World Bank (i.e. GDP per capita, credit to private sector), the Heritage Foundation (i.e. scores for income taxation and cost of doing business) and the International Country Risk Guide (ICRG) (i.e. composite risk indicator). Cross-country OLS regressions are run for OECD migration rates, henceforth “global” migration rates, for 2000 for 117 countries. Table 8 shows the results from estimating equation (1) for high and low skilled workers.³⁰

Table 8. Global Migration Rates (2000)

| | HIGH SKILLED | | LOW SKILLED | |
|--|--------------------|-----------------------------|--------------------|-----------------------------|
| | <i>Coefficient</i> | <i>St. dev</i> [*] | <i>Coefficient</i> | <i>St. dev</i> [*] |
| Constant | 1.78 | 0.430*** | 0.13 | 0.127 |
| GDP per capita (PPP) (log) | -0.043 | 0.020** | 0.013 | 0.058 |
| Risk (log) | -0.19 | 0.106* | -0.015 | 0.029 |
| Marginal Income Tax | 0.11 | 0.043** | 0.044 | 0.016*** |
| Marginal Income Tax squared | -0.014 | 0.007** | -0.006 | 0.002** |
| Population (log) | -0.032 | 0.01*** | -0.008 | 0.003** |
| Distance (log) | -0.022 | 0.030 | 0.001 | 0.009 |
| Language | 0.109 | 0.041*** | 0.004 | 0.011 |
| Domestic credit to private sector/GDP | 0.001 | 0.000*** | 0.000 | 0.000 |
| Cost of doing business | 0.007 | 0.013 | -0.000 | 0.003 |
| Caribbean dummy | 0.432 | 0.099*** | 0.033 | 0.024 |
| Africa dummy | -0.038 | 0.043 | -0.033 | 0.024** |
| Asia dummy | -0.003 | 0.032 | -0.024 | 0.01** |
| R-squared | 0.67 | | 0.38 | |
| Breusch-Pagan test | 23.9 | | 57.19 | |
| N. observations | 117 | | 117 | |

^{*} Robust standard errors.

*** significant at 1%

** significant at 5%

* significant at 10%

³⁰ Appendix 1 provides results for skilled and unskilled migration to North America and Europe, taking into account regional distributions of skills.

a. *High Skilled Migration*

Variables are significant and have the expected sign. The model provides a good fit, accounting for 70% of the variation in the dependent variable.³¹ As expected, income per capita is a key factor in migration decision, with a negative and highly significant coefficient. A 10% increase would produce a 0.04 points reduction in migration rates. Improved perception of risk also contributes to mitigate incentives, with a 10% improvement in the indicator resulting in a 0.2-point reduction in the migration rate. The coefficients point at that changes in risk perception might affect migration decisions more than equivalent variations in income per capita.

Income taxation generates a strong non-linear effect. An increase in the top marginal income tax rate from 10% to 35% (corresponding to a 2.5-point increase in the score index used in the regression) leads on average to a 0.19-point increase in high skilled migration rate.³² The effect is larger starting from low levels of taxation and decrease as the rate increase. As a result, tax policy might create important incentives to leave for highly educated workers, likely to be the highest wage earners in the economy and the most affected by marginal income taxation.³³

Population size also matters: a 10% increase in the population produces a reduction of 0.032 points in migration rate. Population approximates the size of the economy: a larger size would favor economic diversification and productivity, leading people to stay. This helps explain the evidence that small countries generate very high migration rates.

Distance captures the gravity effect suggesting that proximity, by reducing its costs, stimulate migration, as does the fact of being an English-speaking country.³⁴ Availability of domestic credit to private sector, relaxing borrowing constraints and reducing migration costs, and a higher cost of doing business also contribute to higher migration rates.

As expected given the high rate of skilled migration, the Caribbean dummy shows a very strong positive effect with a coefficient of (0.43). This implies that migration from the region explains by itself almost a third of the (variance of the) global high skilled migration rate.³⁵ The other regional dummies show negative low coefficients but are not significant.

Results are robust to alternative specifications of the model. In particular, the introduction of the existing stock of migrants to account for the network effect (i.e. presence of friends and family) partly captures the gravity effect of distance, being it an alternative proxy for migration costs, but does not affect the other variables.

³¹ To simplify the interpretation, we divide the explanatory variables in “gravity” (i.e. distance, language, population) and policy (i.e. risks, credit to private sector, cost of doing business, taxation rate) variables to distinguish across factors and help identify the policy implications of our findings.

³² This would be equivalent to moving from Bahamas taxation rates (10%) to US levels (35%).

³³ Kapur et al (2005): “Once the fiscal system is made too progressive, it will generate an exodus of high skilled, high earning individuals that want to avoid becoming net contributors to the system”.

³⁴ The variable is not significant in this case (i.e. global rates) as it is defined as the distance between capital cities and Washington DC, USA.

³⁵ The presence of the CAR dummy increases R² from 0.5 to 0.7.

b. Low Skilled Migration

Taxation, population size and the regional dummies are robust to the educational attainments but their effect seems to be of second-order in migration decisions by low skilled. The lower explanatory power (smaller overall fit of the model) points at the fact that opportunities differ across schooling levels and low skilled are constrained in their decisions, weakening the relevance of the other “fundamentals” considered here.

In general, the variables that proxy migration costs, like language or distance, play a less important role than in the case of high-skilled migration and hint at that their effect might be strengthened by educational attainments. For instance, it is likely that being English speaker is less likely to be an asset unless it is paired with higher education. As a result, the ability to take advantage of it hinges on higher schooling. The importance of the costs faced in migration decisions is consistent with the fact that income per capita, though not significant, shows a positive coefficient, as for low levels of education, higher earnings help overcome costs, encouraging migration.

Poverty, not considered in the specification, might explain the estimation results. Low-skilled workers are more likely to be poor and limited in their migration opportunities given their cost. Though in principle incentives to leave are stronger for lower educational attainment, poverty might severely limit mobility (i.e. too poor to migrate). As a result, high per capita income would represent an incentive to migrate. This finding is consistent with the literature that underlines that poverty constraint might be large enough to offset the effect of large income gaps.³⁶

c. Comparing results

The analysis of estimation results allows highlighting the following

Skills. Schooling is likely to enhance the impact of explanatory factors on migration rates. For example, changes in taxation policy are likely to be more effective in influencing higher skilled migration. Factors that proxy costs, like language or distance, become more relevant once a certain level of schooling is attained as higher skilled workers show greater sensitivity to the variables considered in the model. For lower levels of education, migration costs and poverty conditions are likely to curb migration opportunities and offset the stronger incentives provided by income differentials.

Income. An inverted relationship exists between income per capita and migration rates. At low-income levels, migration is an “impossible option”, given its high costs, but at higher income levels, migration becomes an “irrelevant option” i.e. “too poor to migrate and too rich to migrate”. This explains why better economic conditions (i.e. higher income) translate in weaker migration incentive for skilled workers, likely to be at the top of the income distribution, and stronger incentives for unskilled ones, likely to be at the bottom.³⁷

Taxation. Tax policy matters and is likely to affect migration decisions across destination and educational levels. As a result, it might be a useful tool to influence migration rates, where deemed

³⁶ See Hatton et al. 2004.

³⁷ See also IDB 2004, Adams et al., 2003, Docquier et al., 2005a.

appropriate. Given their potential earning capacity and the likelihood of being affected by marginal income taxation, skilled workers are more sensitive to policy changes.

Caribbean brain drain. The importance of skilled migration from the Caribbean countries is confirmed by the estimations. See also Appendix 1.

Model specification. The model performs better for skilled migration stressing that some of the variables included are most relevant for higher educational attainments. In the case of low skilled migration, other elements, like poverty, might be at play and explain the lower explanatory power of the independent variables selected.

IV. The implications of skilled migration

This section presents an overview of the potential economic consequences of skilled migration for source countries. This focus on origin countries is dictated by (i) a relative scarce attention to the effect of migration on origin countries³⁸; (ii) a general consensus on the beneficial effect of low-skilled migration (i.e. lower pressure on local labor markets, high remittance flows)³⁹ but an on-going debate on the impact of high skilled migration and (iii) the importance of skilled migration for some developing countries, especially the Caribbean. Besides data availability, the difficulty in gauging the impact of skilled migration and weighing up costs and benefits to assess the economy-wide consequences lies in the fact that migration decisions are private and made on the basis on individual expected costs and benefits. Still, they produce externalities, which entail public costs.

In the absence of external effects, migration would result in higher salaries for qualified migrants, an immigration surplus⁴⁰ for the host country and higher salaries for skilled residents in the source country and remittance flows. This view was shared by the initial contributions to the literature (Grubel and Scott, 1966, Berry and Soligo, 1969). More recent research has drawn increasing attention to the impact of externalities (Bhagwati and Hamada, 1974, Bhagwati, 1976) and the potential human capital depletion (Haque and Kim, 1995). The latter effects, compounded by education expenditures, rising fiscal burdens for residents, higher inequality and deteriorated growth prospects (Barro & Sala-I-Martin, 1995; Lucas, 1990), result in a generalized questioning of the benefits of skilled migration.

The next sections outline the potential implications and the evolution of the economic thinking on the brain drain.

1. The feedbacks

a. Brain gain

Starting in the late 1990s, economic research offers a more optimistic view of skilled migration, emphasizing the human capital accumulation effect of migration prospects. Higher returns on education, triggered by higher wage expectations, would promote skill acquisition (Stark et al.

³⁸ Friedberg and Hunt (1995), Borjas (1999), Commander et al (2002) and Drinkwater, Levine and Lotti (2002) present surveys of the economic effects of migration.

³⁹ See World Bank (2006) for a detailed discussion.

⁴⁰ The 'immigration surplus' according to Borjas (1995) is the increase in income of the indigenous population of the host country following immigration.

1997,1998; Mountford, 1997; Stark, 2002, Docquier et al. 1999, 2005 Beine et al. 2001, 2003, Stark and Wang, 2002)) but, as opportunities to leave do not materialize for all workers, residents would end up being on average more educated, with a prevalence of the gain over the drain effect.⁴¹ Still, some empirical evidence (Pang et al., 2002, McClelland, 2002, Lowell et al., 2001) and Faini, 2002) points at a negative impact.⁴²

Interestingly, Beine et al. (2003) conclude that, while the “gain” effect emerges at the aggregated level, the “drain effect” prevails in countries with high migration rates.^{43,44} This result is supported by Mariani (2005), who finds that the positive effect of skilled migration is contingent on human capital distribution: in presence of a numerous middle class interested in higher education, migration might be growth enhancing, as skills will be replaced and migration opportunities will constitute an incentive for human capital accumulation. Using panel data and considering convergence models, Beine et al. (2005) also conclude that, in low and high-income countries, migration does not constitute an incentive for human capital accumulation. As a result, lower skilled migration would contribute to reduce human capital losses, especially in countries that experience high migration rates.

Return migration is generally perceived as part of the brain gain, as returnees are expected to possess new skills acquired during their stay abroad. Yet, research has emphasized that return migration is likely to amplify the initial (negative) selection bias: if migrants were relatively skilled, then returnees will be likely to be less skilled (Borjas, 1989, Borjas and Bratsberg, 1996, Solimano, 2002, Reagan and Olsen 2000).⁴⁵ The scant data available on these flows constitute an obstacle to gauge their relevance. Moreover, their contribution to the economy’s productivity hinges on whether (i) origin countries are positioned to cash in on these new skills, given the existing technology gap and the resulting difficulty to employ these skills ⁴⁶ and (ii) returnees are involved in productive activities or are rather retired. More consistent evidence exists as to the positive impact of the diaspora, given its potential to stimulate trade and investment opportunities. ⁴⁷

b. Remittances

Remittances, being its most direct result, are often considered by policy makers as *the return on migration*. The UN Secretary General report (2006) states: *“because remittances are an immediate and tangible benefit of international migration, it is easy for policymakers simply to let international migration continue uninterrupted. This is a mistake. International migration can easily masquerade as a substitute for sound development policies and countries can become dependent on remittance flows. Without the right economic environment, international migration can convert sending areas into “nurseries and nursing homes” instead of producing dynamic economies, which, over time, may offer attractive alternatives to migration.”*

As indicated in the introduction, remittances constitute an important source of external financing

⁴¹ See Docquier and Rappaport (2005) for a more detailed discussion.

⁴² See WB (2006c). ed. by Schiff.

⁴³ In particular, this occurs for countries with skilled migration higher than 20% and/or the share of skilled people over total population is above 5%. Estimations for Guyana and Jamaica, included in the sample, indicate growth net losses (% of annual GDP per capita) of 0.7% and 1.6% respectively.

⁴⁴ This is tantamount to say that migration is not detrimental when skills are not in short supply as the economy can draw from a larger pool of educated workers.

⁴⁵ If migrants were initially relatively skilled, the least skilled will most likely return to their home country.

⁴⁶ Unsatisfactory working conditions are among the factors that pushed migrants to leave in the first place.

⁴⁷ See WB (2006) “Diaspora Networks and the International Migration of Skills”.

and a contribution to consumption and investment possibilities for recipient countries.⁴⁸ It is difficult to question remittances' role in alleviating liquidity constraints of receiving households in the short run, but their impact on poverty and development is under debate.⁴⁹ Available evidence finds that the propensity to remit is a declining function of (i) the length of migrants' stay⁵⁰ (Lucas and Stark, 1985), (ii) the per capita income in sending country and (iii) the share of migrants with tertiary education raised (Faini, 2002). These findings are particularly relevant in the case of countries experiencing substantial brain drain.

As to the effect of remittances on growth, Chami et al. (2005) emphasize their compensatory nature and the difficulty to consider them as a source of capital for economic development. They substitute labor income, affecting recipients' incentive to participate in labor supply, with negative consequences on economic activity. Giordano et al. (2005) find that, accounting for the depth of the financial system, remittances promote growth in less financially developed countries, helping alleviate credit constraints and improving capital allocation. These findings point toward the contribution of remittances to the development of the financial sector in countries where the latter is inadequate to provide the services (insurance, credit) required by the population.

Contributions analyzing their impact on poverty highlight remittance's role in relaxing liquidity constraints and help consumption smoothing (Adams and Page, 2003, Adams, 2004, and Ruiz et al., 2006). Microeconomic studies, based on household surveys, confirm their mitigating impact on the severity of poverty when recipients are at the bottom of the income distribution and these flows represent an important component of household incomes. They also find a positive outcome, as remittance recipients are likely to invest more on education than households that do not.

Yet, no clear evidence has emerged on their contribution to reduce structural poverty. One of the reasons is that, generally, remittances do not accrue directly to the poorest strata of the population, as they lack the means to face migration costs and leave in the first place. As a result, an inverted U-shape relationship exists between the level of per capita income and international migration (Adams et al., 2003, Docquier et al., 2005a).

In 2004, remittances to developing countries amounted to \$160 billion, equivalent to 0.4% of the world output, in steady increase since 1990, and were distributed across geographic region with East Asia and LAC accounting each for 26% of the total, followed by Middle East and North Africa, with 20%.⁵¹

Table 12.. Remittances/GDP ratio by recipient regions

| | 1990 | 2000 | 2004 |
|---------------------------------------|------|------|------|
| East Asia & Pacific | 0.7 | 1.0 | 1.6 |
| Europe & Central Asia | 0.8 | 1.4 | 1.1 |
| Latin America & Caribbean | 0.8 | 1.0 | 2.0 |
| Middle East & North Africa | 3.8 | 2.7 | 3.6 |
| South Asia* | 2.1 | 2.8 | 3.6 |
| Sub-Saharan Africa | 1.0 | 1.4 | 1.4 |

*South Asia: Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka
Source: Global Development Finance (2006), WDI.

⁴⁸ See IMF 2005 for a complete discussion.

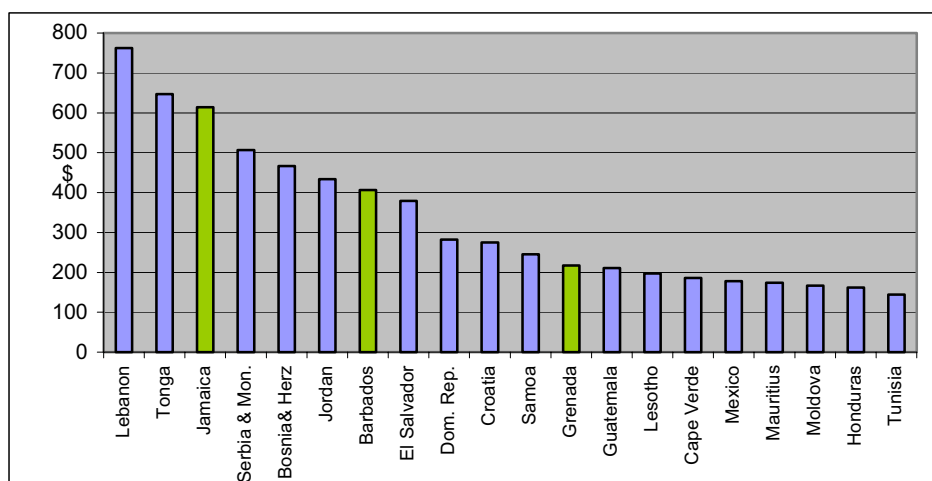
⁴⁹ UN Secretary General Report, A/60/871, (2006).

⁵⁰ Reagan and Olsen (2000) find that skilled migrants tend to stay longer in destination countries.

⁵¹ Remittances are defined as the sum of workers' remittances and employee compensation.

Table 12 illustrates that the poorest regions in the world do not show the highest ratios, confirming that the bulk of migration originates in middle-income countries. In particular, only four least developed countries (Haiti, Samoa, Cape Verde, Lesotho) appear among the highest recipients in per capita terms.⁵² Figure 6 shows that, among the 20 highest remittance recipients in per capita terms, 35% of the highest recipients are Small Island Developing States, SIDS, and 15% are Caribbean.⁵³ This is a consequence of the intensity of their migration and their small population size.

Figure 5. Top 20 countries with highest remittance per capita (2004)



Source: GDF, 2006.

In 2003, remittances represented 10% of the Caribbean regional GDP, increasing at average annual rate of 16% since 1990. Grenada, Haiti, Dominica and Jamaica experienced the largest inflows.

Table 5. Remittances/GDP ratio in Caribbean countries

| % | 1990 | 2003 | Avg. 1980-2003 |
|----------------------------------|------|------|----------------|
| Antigua and Barbuda | 3.3 | 1.4 | |
| Bahamas, The | -1.4 | -0.1 | |
| Barbados | 2.2 | 4.3 | 2.8 |
| Belize | 4.4 | 1.7 | 3.8 |
| Dominica | 8.4 | 1.5 | 3.9 |
| Dominican Republic | 4.5 | 14.1 | 7.1 |
| Grenada | 8.1 | 5.3 | 5.6 |
| Guyana | n.a. | 8.6 | 1.8 |
| Haiti | 2.1 | 27.8 | 8.6 |
| Jamaica | 5.0 | 18.6 | 9.2 |
| Saint Kitts and Nevis | 11.9 | 1.1 | 2.5 |
| Saint Lucia | 4.0 | 0.6 | 1.4 |
| Saint Vincent and the Grenadines | 8.1 | 0.8 | 2.1 |
| Suriname | 0.3 | 2.4 | 0.5 |
| Trinidad and Tobago | 0.1 | 0.8 | 0.3 |

Source: GDF, 2006, IMF.

⁵² As defined by the UN, <http://www.un.org/special-rep/ohrlls/ldc/list.htm>

⁵³ As defined by the UN at <http://www.un.org/special-rep/ohrlls/sid/list.htm>

The role that remittances might play in development is not negligible in these countries, given that the region provides the largest pool of migrants to OECD countries, and that migration of skilled workers is especially intense. According to a recent IMF report (2005b), remittances in the Caribbean constitute an important source of finance for private investment, smooth private consumption volatility and are counter-cyclical. This is extremely important, in a region prone to natural disaster and characterized by high volatility due to a very limited production and export base.

2. The externalities

As mentioned above, migration might generate important externalities, as individuals do not internalize the costs their mobility decisions impose on society at large. Let alone the potential impact on growth prospects due to skill depletion, this section considers the impact on labor markets, public finances and competitiveness.

a. Labor markets

The extent to which migration affects labor market outcomes is contingent on the existent of surplus labor. The latter determines the adjustment process to a lower supply of skilled labor.

Migration is often viewed as a mechanism to mitigate unemployment risks, due to excess labor supply. This “safety valve” is more likely to apply to low-skilled migration and in this case it might turn out to be welfare enhancing, given the higher probability of surplus labor and the absence of external effects.⁵⁴ Still, it might be difficult to coincide with this perspective in the case of skilled migration, given that the bulk of migration has a South-North dimension, the South is still at a developing stage and talent is essential for progress.⁵⁵ Though innovation processes rarely initiate in developing countries, short skill supply might reduce the speed of the dissemination of technological advances, as well as the implementation of new technology, delaying improvements in the “production possibility frontier” of the economy.

As the probability to face tight labor markets is higher for skilled labor, the outflows of workers directly reduce domestic supply, increasing the marginal productivity of residents and their wages. Indirectly, supply might further be affected by a lower participation rate generated for instance by the inflow of remittances and their impact on reservation wages.⁵⁶ In the short run this might result in higher labor costs.

In the presence of externalities across skills, migration of educated workers might entail consequences for low skilled workers in terms of lower productivity. The degree of complementarity across skills and the dimension of skilled migration would determine the impact on unskilled labor demand. If employment has to be kept to its full level, the decrease in the marginal productivity of low-skilled workers associated with a relatively higher supply will result

⁵⁴ In the case of higher skills, the possibility that skill supply exceeds demand might be attributable to a lack of fine-tuning to the requirements of the economy.

⁵⁵ See Ellerman (2003) for more details.

⁵⁶ The latter would also depend on other labor market institutions like the presence of unemployment benefits.

in lower real wages. The size of the wage adjustment would depend on the elasticity of the labor demand.⁵⁷ Moreover in a context of wage rigidities, unemployment is likely to increase.

A study by IDB (2004)⁵⁸ on LAC shows that demography, participation rates and migration help explain changes in labor supply. In particular, population growth explains almost 92% of the changes, followed by participation rates (13%) and migration outflows (-5%). According to the results, net migration flows only produce a decline in the labor supply of 0.14% a year, equivalent to 5% of total growth rate. Still, in the case of the Caribbean countries, which present high migration rates, outflows reduce labor force growth by 1 percentage point in the case of Jamaica, 1.2% for Suriname and 1.3% for Guyana)

b. Public finances

The public “cost” of migration compounds spending on education and foregone revenue (opportunity costs). The first is the direct reflection of education policies. The subsidy element present in tertiary education leads to a lower selectivity in education demand and a larger number of graduates than would result from an internalization of the full costs. Moreover, the lower signaling content of tertiary education ends up being a push factor for the brightest students to seek better opportunities abroad. Several countries adopt a loan system to finance education. While valuable by itself, this mechanism often suffers from a lack of credibility due to the weak enforcement capacity of the government and results in high default rates.

The opportunity cost of foregone revenues arises from the tax base erosion produced by a lower supply of skilled workers, whose income are in the highest “tax brackets” and who are likely to be net taxpayers. Although migrants contribute by sending remittances, as the latter accrue to individuals, governments are unable to dispose of them. As a consequence, the difficulty to tax remittances, a lower level of revenue and the continuous need to finance education expenses end up translating in a higher tax burden for residents. The increase in the tax burden is related to the intensity of migration flows (supply-reduction) and to labor demand elasticity.

Given the externalities in the labor market, the wage reduction, resulting from falling productivity of low-skilled workers, while sufficient to maintain employment at its “*pre-skilled migration*” level might affect disposable income and consumption possibilities, leading to potential increase in income inequality and poverty.⁵⁹ As a result, source countries might be faced with lower revenues (unless changes are made in the tax rates), sustained education expenditure and the necessity to complement labor incomes.

In the case of developing countries, high skilled migration compounds a situation of limited development opportunities and drains on scarce fiscal and human resources. This makes it difficult to carry out meaningful redistributive policies. Faced with a potentially higher level of expenditure, their option to increase taxation might also be limited. Moreover, as emphasized by regression results, resorting to higher taxation might stimulate further migration.⁶⁰

⁵⁷ Empirical evidence on the link between migration and wages is limited given the role that other factors may play on wages.

⁵⁸ IPES 2004.

⁵⁹ This is independent of the poverty-reducing effect that remittances might have.

⁶⁰ This is relevant for Caribbean economies given that they are the most indebted countries in the world and that are likely to face important budgetary constraints.

The erosion in the tax base makes redistribution and poverty reduction policies more challenging to implement. Moreover, governments need to continue devoting resources to education to supply the skills that become scarce as a result of migration.⁶¹ In this context, governments might find themselves with lower revenues and increasing needs.

c. Competitiveness

Another potential cost of migration relates to the lower competitiveness caused by due to remittance flows. Rajan et al. (2005) exclude the possibility of a Dutch disease effect. But as foreign exchange flows lead to a higher demand of non-tradables, this might translate into a real exchange rate appreciation. Evidence exists that wages or land prices are higher in regions with large numbers of migrants abroad. These prices might have a negative impact on economic activity unless productivity rises to match them. For this reason, international migration may reduce local production in the short-run, especially in activities that rely heavily on labor, but over the medium to long-term, it may increase production through the income and investment multipliers it generates (Massey et al., 1998; Taylor et al., 1986).

3. Weighing out potential costs and benefits

This section provides some estimates of the potential losses and gains engendered by skilled migration. Following Borjas (1995) and using DM database data, Mishra (2006a) estimates migration costs for the Caribbean countries considering three kinds of cost that might result from migration: (i) the deadweight loss resulting from a labor demand-supply model as the source country ends up producing less at higher wages; (ii) the negative impact on unskilled labor's productivity accruing from a reduced supply of skill workers and (iii) government expenditure on education. The findings highlight that these costs outweigh remittance flows in most of the countries examined.⁶²

Given the private nature of migration decisions, benefits in recipient countries (i.e. remittance flows) accrue to individuals while costs are public. As a result, it might be difficult to weigh them out. This section, as the IMF study, also assumes that they can be compared. Moreover, it proposes a simple estimation of the costs and benefits for other regions experiencing skilled migration to provide a benchmark for LAC and the Caribbean. To do this, costs arising from education and externalities are compounded with the opportunity costs of lost tax collection.

Assumptions on skilled emigration losses and lost fiscal surplus are based respectively on Mishra, 2006a, and Kapur and McHale, 2005. Table 10 shows the estimations based on the weighted average skilled migration rates (column a). In particular, column b presents the migration loss, calculated as the deadweight loss resulting from a labor demand-supply model where, due to the brain drain, the source country ends up producing less at higher wages. The education expenditure (column c) is estimated on the basis of Unesco data and the fiscal surplus (column d) is the product of the net tax rate (assumed at 20%) and the wages of the lost workers. Appendix 2 provides details on the calculations. These effects are combined in column e.

⁶¹ This is the case of medical professionals in several developing countries (i.e. South Africa, Jamaica).

⁶² The study was carried out for the Caribbean countries, which are the ones to experience the highest rates of skilled migration and the largest flows of remittances compared to GDP.

Table 10. Total losses due to skilled migration (% GDP)

| | Skilled migration rate (a) | Emigration loss (b) | Estimated education expenditure (c) | Fiscal surplus loss (d) | Total loss (e=b+c+d) | Remittances Average 2000-04 |
|---------------------------------------|-------------------------------|------------------------|--|----------------------------|-------------------------|-----------------------------|
| East Asia & Pacific | 7.10 | 0.03 | 0.38 | 0.43 | 0.84 | 1.30 |
| Europe & Central Asia | 6.94 | 0.03 | 0.73 | 0.42 | 1.17 | 1.20 |
| Latin America & Caribbean | 10.97 | 0.07 | 1.11 | 0.66 | 1.84 | 1.58 |
| Middle East & North Africa | 9.89 | 0.06 | 0.83 | 0.59 | 1.48 | 3.30 |
| South Asia | 5.32 | 0.02 | 0.50 | 0.32 | 0.84 | 3.46 |
| Sub-Saharan Africa | 12.97 | 0.10 | 0.30 | 0.78 | 1.18 | 1.37 |
| Caribbean | 38.60 | 0.89 | 4.80 | 2.32 | 8.01 | 5.80* |

*2003 average. Source: Own calculations

To simplify the estimations, externalities are not considered. Assumptions (i.e. wage elasticity to changes in the labor force, skilled labor share of national income, and tax rates) are the same across regions. This implies that results are driven by the importance of skilled migration. As expected, losses for LAC and the Caribbean are very high.

Even though, estimations proposed here only take a “public finance” perspective, these results are consistent with the “brain drain” findings of part of the literature that highlight a detrimental result for growth and development prospects for countries that experience high migration in rates, like the Caribbean. Table 11 shows results for the Caribbean countries based on Mishra (2006) and author’s estimations of the fiscal surplus loss.⁶³

Table 11. Total losses due to skilled migration in the Caribbean (% GDP)

| | Estimated education expenditure* (a) | Emigration loss* (b) | Fiscal surplus loss** (c) | Total loss (d=a+b+c) | Remittance (avg 1980 - 2002) |
|--------------------------|---|-------------------------|------------------------------|-------------------------|------------------------------|
| Antigua and Barbuda | 8.8 | 2.7 | 4.0 | 15.5 | 3.0 |
| Bahamas, The | 1.1 | 2.3 | 3.7 | 7.0 | - |
| Barbados | 7.4 | 2.4 | 3.8 | 13.6 | 2.3 |
| Belize | 2.7 | 2.6 | 3.9 | 9.2 | 4.7 |
| Dominica | 5.0 | 2.5 | 3.9 | 11.3 | 8.4 |
| Dominican Republic | 0.2 | 0.3 | 1.3 | 1.8 | 5.3 |
| Grenada | 5.7 | 4.3 | 5.1 | 15.2 | 11.0 |
| Guyana | 6.8 | 4.7 | 5.3 | 16.9 | 1.9 |
| Haiti | 0.8 | 4.2 | 5.0 | 10.0 | 10.1 |
| Jamaica | 7.7 | 4.3 | 5.1 | 17.1 | 7.4 |
| Saint Kitts and Nevis | 9.4 | 3.7 | 4.7 | 17.8 | 6.9 |
| Saint Lucia | 2.0 | 3.0 | 4.3 | 9.3 | 0.4 |
| St Vincent and the Grens | 7.0 | 4.3 | 5.1 | 16.4 | 7.2 |
| Suriname | 1.3 | 1.4 | 2.9 | 5.5 | 0.5 |
| Trinidad and Tobago | 6.2 | 3.8 | 4.8 | 14.7 | 0.3 |

*Mishra (2006) **Author’s estimations based on net tax rate of 20%.
Source: Mishra, 2006a and author’s estimations.

⁶³ Fiscal losses have been included and estimated with a next tax rate of 20%, as in Table 10.

V. Managing migration: a review of policy options

Given its private nature and public costs, appropriate instruments to directly manage migration are complex to identify. The evidence provided indicates that policy-variables (i.e. quality of the “business environment” or taxation policy) might affect the decision of workers to leave. Clearly, the incentive they provide is stronger for skilled migrants because of their high mobility and capacity to face relocation costs. The analysis above hints at that it is difficult to consider migration as a spontaneous phenomenon and not as a symptom of a non-performing economy. As a result, macroeconomic policies aimed at fostering good governance, functioning markets and creating opportunities might curb incentives to migrate.

From a political economy perspective, unless there is a clear perception of high public costs (i.e. deteriorated growth prospects), migration might contribute to relieve pressure from the government to implement a meaningful reform agenda.⁶⁴ This might result in a delayed implementation of the measures needed to address the structural problems of the economy that eventually push people to leave.

A consistent reform agenda (i.e. labor market, taxation, trade policy) would enhance macroeconomic performance and contain migration incentives, creating a virtuous circle. Still, feedback effects (remittance flows, network effects) seem to be prevailing in authorities’ perception of migration, despite evidence that remittances do not accrue to the most needy, their effect on structural poverty is under debate and they are difficult to tax.⁶⁵ The lack of reforms would potentially result in a vicious circle where human capital depletion brings about a diverging equilibrium.⁶⁶ Table 12, drawn from McHale and Kapur⁶⁷, provides a summary of the policy options available to tackle migration and of the role to be played by sending and recipient countries, as well as international institution. Concerted action and policy coordination among stakeholders, ranging from control to compensation measures, are crucial to mitigate both the pull and push factors that stimulate migration.⁶⁸

⁶⁴ Beine et al. (2003) find that skilled migration above a certain level has a negative impact on growth.

⁶⁵ The debate on the possibility to revisit the Bagwhati tax on migrants’ income, as a price for continuous citizenship (Kapur et al. 2005), is on going. Redress could be obtained by taxing skilled emigrants (Bhagwati and Wilson, 1989; Bhagwati, 1991; Kapur and McHale, 2006). However, taxation of citizens abroad, while possible in principle, is very difficult to implement, especially in the presence of limited institutional capacity. Governments might be better positioned to obtain repayment for scholarships granted to pursue higher education rather collecting taxes. It has therefore been suggested that countries of destination could share the tax paid by skilled migrants with origin countries.

⁶⁶ Besides migration, policy-makers’ myopia due to the political cycle also contributes to their unwillingness to reform.

⁶⁷ UN REPORT A/60/871

⁶⁸ McHale, 2005 and the UN REPORT A/60/871 provide a detailed description of policy options.

Table 12. Policy response to migration

| POLICIES | INSTRUMENTS | | |
|---------------------|---|--|---------------------------------------|
| | Rich Countries | Poor Countries | International Organizations |
| Control | Shift balance toward unskilled immigration Curb skill-poaching programs unless compensation schemes are in place | Curb illegal migration Improve economic and political stability | Promote economic development |
| Creation | Avoid shortages in areas such as health and education due to poor human capital planning Transparent mechanisms for recognition of foreign credentials | Higher education reforms Liberalize skilled immigration | Increase support for higher education |
| Compensation | Share social security taxes Tie development aid to skilled emigration Firms pay headhunter fees to source security | Exit tax Tax foreign income | Improve migration data |
| Connection | Encourage circulatory migration Strengthen temporary migration programs | Dual citizenships | Develop network infrastructure |

Source: McHale and Kapur, 2005

VI. Conclusion

The paper, in reviewing the Caribbean migration experience in the light of LAC and global trends, highlighted several issues that might be helpful to devise adequate policy response. In particular:

Migration from the Caribbean is concentrated by destination (i.e. over 85% of migrants reside in North America) and skill (i.e. highest skilled migration rates in the world). These characteristics should be devoted attention by policymakers, given their potential consequences in terms of skill depletion, worsened growth and development prospects, and public costs, in a region that has traditionally featured volatile growth performance and faced serious fiscal constraints.

Policy-making by developing countries contributes to shape migration decisions, as do selective immigration policies by the “North”. School attainments determine the responsiveness to push and pull factors and skilled workers are more likely to be negatively affected by a less conducive environment. Given the combination of several factors in molding migration decisions, effective policy response to manage flows results from a coordinated action between origin and recipient countries.

Migration decisions are private. In a world of no externalities and adequate skill supply, benefits accrue to individuals (i.e. higher salaries and remittances), where education costs are not strongly subsidized, society, as a whole, might be better off. Once externalities emerge, migration rates are high and skills are scarce, public costs might become relevant and benefits difficult to appropriate

by society at large. The case of LAC, and the Caribbean in particular, indicate that skilled migration might turn out to be particularly expensive.

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ANNEX I

Regional distribution of skilled migration

Evidence presented in previous sections, and confirmed by alternative sources⁶⁹, shows that there exists a regional distribution of skills. North America and Europe clearly show different pattern of immigration, both in terms of skill and origin countries. In particular, in 2000⁷⁰

- North America hosted 50% of total OECD migrant stock and Europe 39%.
- Europe attracted mainly low skilled workers: 56% of the total OECD low skilled migrants.
- 53% of the migrant stock living in EU had less than 6 years of schooling, against 24% in NA and 35% in Asia.
- Low skilled migration originated mainly from Europe (50%), Asia (25%) and Africa (17%), indicating that the bulk came from higher income countries.
- Skilled labor tended to concentrate in NA (65% of the total), with Asian migrants representing 40%, European, 26% and LAC, 22%⁷¹.

Based on these stylized facts, this section provides an analysis of the determinants of international migration, discriminating between North America (NA) and Europe (EU), and presents estimation results based on equation (1) for both destinations.⁷²

(i) *Migration to NA*

Estimations for NA confirm the results obtained for global rates. In the case of high skilled migration, the model has a higher predictive power and all variables maintain their significance, even though with weaker impact than in the case of global rates. For example, an increase in the top marginal tax rate from 10% to 35% leads on average to a 0.13-point increase in high skilled migration. Distance turns out to be significant. Additionally, the Caribbean dummy shows a large coefficient (0.47), indicating the importance of Caribbean brain drain and its concentration in North America.⁷³ The similarity in estimation results for global and NA rates is due to the relevance of brain drain to NA

⁶⁹ UN/POP/MIG/SYMP/MP/2003/11/Rev (2006)

⁷⁰ Based on stock data for 2000.

⁷¹ LAC share of total NA migrant stock passed from 31% in 1990 to 42% in 2000

⁷² According to evidence presented in the previous sections, these areas are the largest recipients of international migration. North America includes USA, Canada and Mexico and Europe EU 15, Switzerland, Slovak and Check Republic, Poland, Norway and Iceland.

⁷³ The presence of the CAR dummy increases R² from 0.6 to 0.8.

Table 9. Migration rates to North America (2000)

| | HIGH SKILLED | | LOW SKILLED | |
|---|--------------------|-----------------------------|--------------------|-----------------------------|
| | <i>Coefficient</i> | <i>St. dev</i> [*] | <i>Coefficient</i> | <i>St. dev</i> [*] |
| Constant | 1.52 | 0.431 ^{***} | 0.12 | 0.050 ^{**} |
| GDP per capita (PPP) (log) | -0.040 | 0.014 ^{***} | -0.006 | 0.004 |
| Risk (log) | -0.106 | 0.093 | 0.013 | 0.016 |
| Marginal Income Tax | 0.075 | 0.030 ^{**} | 0.014 | 0.008 [*] |
| Marginal Income Tax squared | -0.009 | 0.005 ^{**} | -0.002 | 0.001 [*] |
| Population (log) | -0.019 | 0.006 ^{***} | -0.001 | 0.0014 |
| Distance (log) | -0.057 | 0.030 [*] | -0.013 | 0.007 [*] |
| Language | 0.095 | 0.034 ^{***} | 0.004 | 0.0039 |
| Domestic credit to private sector /GDP | 0.000 | 0.000 ^{**} | 0.000 | 0.000 |
| Cost of doing business | 0.001 | 0.009 | -0.002 | 0.002 |
| Caribbean dummy | 0.467 | 0.105 ^{***} | 0.037 | 0.021 [*] |
| Africa dummy | -0.068 | 0.032 ^{**} | -0.013 | 0.006 ^{**} |
| Asia dummy | 0.025 | 0.023 | 0.002 | 0.004 |
| R-squared | 0.79 | | 0.46 | |
| Breusch-Pagan test | 90.0 | | 189.9 | |
| N. observations | 117 | | | |

• Robust standard errors.

*** significant at 1%

** significant at 5%

* significant at 10%

In the case of estimations for low-skilled migration, which generally confirm the “global” findings, it is interesting to notice that a higher income per capita (though not significant) discourages migration, as for higher skills. A plausible explanation for this “result” is that migrants to NA might be driven by a search for better opportunities rather than a need to escape the poverty trap. This might also be associated with the fact that migration to NA seem to originate from higher income countries than in the case of Europe.

(ii) *Migration to EU*

Estimations for Europe, while consistent with the global picture, also point at important differences, related to its particular experience of immigration, especially the fact of being characterized by low skilled migration. In the case of high skilled migration, economic variables seem to play a weaker role than in the case of NA. Tax policy has a smaller impact (i.e. an increase in the top marginal income tax rate from 10% to 35% leads to a 0.11-point increase in migration rate). Still, there exists an inverse U shaped curve. While most variables maintain similar impact as in the cases previously analyzed, high skilled migration to EU seem to respond more to institutional variables, like business climate. For instance, a 1-point increase in the cost of doing business indicator (i.e. less friendly business environment) produces an increase in the high skilled migration rates by 0.02 points. The CAR dummy is not significant and its explanatory power is limited.⁷⁴

⁷⁴ ⁷⁴ The presence of the CAR dummy increases R² from 0.41 to 0.43.

Results for low skilled migration show a very particular feature: the income coefficient has a positive sign and is significant, indicating that the propensity for low skilled labor to settle in EU is a positive function of income.⁷⁵

Table 10. Migration rates to EU 2000

| | HIGH SKILLED | | LOW SKILLED | |
|---|--------------------|-----------------------------|--------------------|-----------------------------|
| | <i>Coefficient</i> | <i>St. dev</i> [*] | <i>Coefficient</i> | <i>St. dev</i> [*] |
| Constant | 0.62 | 0.28** | 0.055 | 0.081 |
| GDP per capita (PPP) (log) | -0.011 | 0.013 | 0.007 | 0.004* |
| Risk (log) | -0.107 | 0.079 | -0.027 | 0.019 |
| Marginal Income Tax | 0.066 | 0.030** | 0.019 | 0.025** |
| Marginal Income Tax squared | -0.009 | 0.004** | -0.002 | 0.001* |
| Population (log) | -0.023 | 0.006*** | -0.005 | 0.002*** |
| Distance (log)⁷⁶ | 0.018 | 0.019 | 0.007 | 0.006 |
| Language | 0.050 | 0.030* | -0.000 | 0.011 |
| Domestic credit to private sector /GDP | 0.000 | 0.000*** | 0.000 | 0.000 |
| Cost of doing business | 0.018 | 0.010* | 0.002 | 0.003 |
| Caribbean dummy | 0.059 | 0.054 | 0.002 | 0.016 |
| Africa dummy | 0.030 | 0.029 | -0.014 | 0.012 |
| Asia dummy | -0.026 | 0.019 | -0.020 | 0.007* |
| R-squared | 0.43 | | 0.28 | |
| Breusch-Pagan test | 74.69 | | 38.75 | |
| Number of observations | 117 | | | |

^{*} Robust standard errors.

*** significant at 1%

** significant at 5%

* significant at 10%

Besides differences across skills, it is interesting to consider that migration characteristics are heterogeneous across source and destination countries. High skilled migration to NA shows a greater responsiveness to economic variables such as income per capita and taxation than does migration to EU. Regional skill distribution is reflected in the fact that estimations for global rates show similar patterns as migration to NA in the case of high skilled labor and to EU in the case of low skilled ones.

⁷⁵ Lucas et al (2006) find the same results.

⁷⁶ Distance is expressed as distance from DC.

ANNEX II

This annex briefly explains the assumptions behind the estimation of the costs and benefits of skilled migration, presented in section IV.

This section combines the approaches proposed by Mishra (2006a) and Kapur and McHale (2005) to estimate respectively the efficiency and education costs, and the fiscal surplus loss engendered by skilled migration.

Mishra (2006a), which follows Borjas (1995) and uses DM database data, considers three kinds of cost that might result from migration:

- (i) the deadweight loss resulting from a labor demand-supply model as the source country ends up producing less at higher wages;
- (ii) the negative impact on unskilled labor's productivity accruing from a reduced supply of skill workers and
- (iii) government expenditure on education.

Kapur and McHale (2005) consider the opportunity cost for the government in terms of foregone revenues.

The paper here assumes away external effects and, based on DM database data, estimates the total public loss (% GDP) accruing to society as the combination of

- (i) the deadweight (efficiency) loss;
- (ii) the government expenditure on education, and
- (iii) foregone fiscal revenue

Deadweight loss (Harberger's triangle) is calculated as

$$\text{dead weight loss} = \frac{1}{2} s_s * e_s * m_s$$

where

- ✓ s_s = the skilled labor shares of national income, *assumed at 0.3*⁷⁷
- ✓ e_s = the magnitude of elasticity of factor price of skilled labor i.e., percentage change in wage of skilled labor resulting from a 1 percent change in the size of the labor force, *assumed at 0.4* and
- ✓ m_s = the fraction of skilled labor force that emigrates skilled migration rate from DM database.

Education expenditure is estimated using UNESCO database as

- ✓ government expenditure (across all schooling levels) for all skilled migrants over GDP

⁷⁷ In the calculations, the assumed skilled labor share of GDP is 0.3. This follows from the assumption that the highly educated belong to the top 20 percent of the income earners. The average income share of the top 20 percent is about 0.4 as estimated by Dollar and Kraay (2002). Consequently, the assumed share of skilled labor in GDP is the overall labor share in GDP * 0.4 = 0.7*0.4=0.28. See Mishra (2006) for details.

Foregone revenue is calculated as

- ✓ the product of the net tax rate and the share of migrant labor in GDP, which is the product of the skilled labor shares of national income and the fraction of skilled labor force that emigrates (=migration rate).

$$\text{foregone revenue} = \tau * s_s * m_s$$

where

- ✓ τ = the net tax rate (assumed at 20%)
- ✓ s_s = the skilled labor shares of national income, *assumed at 0.3*
- ✓ m_s = the fraction of skilled labor force that emigrates skilled migration rate from DM database.

To simplify the estimations, the same assumptions are maintained across regions and countries. This implies that results are driven by the relevance of the brain drain.