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International Migrants in Developed, Emerging and Developing Countries: An Extended Profile

Jean-Christophe Dumont, Gilles Spielvogel and Sarah Widmaier

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INTERNATIONAL MIGRANTS IN DEVELOPED, EMERGING AND DEVELOPING COUNTRIES: AN EXTENDED PROFILE

Jean-Christophe Dumont, Gilles Spielvogel and Sarah Widmaier

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ABSTRACT

Increasing international mobility makes international comparable data even more important, to depict global migration patterns and its characteristics, not only in receiving countries but also in origin countries. This paper provides a detailed picture of immigrant and emigrant populations around the year 2000 based on the new global bilateral migration database DIOC-E.

DIOC-E gives the opportunity to investigate various aspects of South-South migration and to make reliable comparisons with South-North migration. In particular, emigration rates for different skill levels can be computed, including many key destination countries outside the OECD area, based on more accurate education data in origin countries. This refines and challenges previous conclusions regarding the relative importance of migration in different regions of the world, main characteristics of emigrants, and sheds light on such key issues as the gender dimension of international migration and the selectivity of migration flows.

DIOC-E (release 2.0) covers 89 destination countries, of which 61 are outside the OECD area. It includes information on 110 million migrants aged 15 and over by skill level, age, gender and labour market outcomes, which represents around 72% of the estimated number of international migrants worldwide. In total there are 46.8 million low-skilled migrants (43.6%), 37.5 million migrants with intermediate skill level (35%) and 23 million highly skilled migrants (21.5%). Although low-skilled migration still dominates in absolute terms both to the OECD and to non-OECD countries, emigration rates for highly skilled persons exceed total emigration rates in all regions, which reflect the selective nature of migration. The econometric analyses of bilateral determinants of migration of the high-skilled distinguish South-North and South-South migration. Regarding migration to OECD countries, the relationship between the emigration rate of the highly skilled and the income level of origin countries follows an inverted U-shape relationship. But this is not the case for migration to non-OECD countries. Both total and high-skilled emigration rates to non-OECD countries steadily increase as the level of income of the origin countries decreases.

Keywords: international migration, database, DIOC-E, DIOC, migrant stocks, emigration rates, skills, education, immigrants, emigrants, development

RÉSUMÉ

La croissance de la mobilité internationale souligne l'importance de données internationales comparables pour décrire la migration mondiale et ses caractéristiques, non seulement dans les pays de destination mais aussi dans les pays d'origine. Ce document donne une image détaillée des populations émigrée et immigrée dans les années 2000 à partir de la nouvelle base de données bilatérale mondiale DIOC-E.

DIOC-E offre la possibilité d'étudier différents aspects de la migration sud-sud et de réaliser des comparaisons fiables avec la migration sud-nord. En particulier, des données fiables dans les pays d'origine permettent de calculer des taux d'expatriation par niveaux d'éducation en incluant les grands pays de destination hors de la zone OCDE. Cela remet en question des conclusions établies précédemment sur l'importance relative de la migration dans différentes régions du monde, affine les caractéristiques principales des émigrés et donne un éclairage sur des questions clés comme la dimension « genre » de la migration internationale et la sélectivité des mouvements migratoires.

DIOC-E (release 2.0) contient des données pour 89 pays de destination, dont 61 sont en dehors de la zone OCDE. La base de données contient des informations par niveaux d'éducation, âge, genre et des résultats sur le marché du travail pour 110 millions de migrants âgés de 15 ans et plus, soit environ 72% de l'estimation mondiale des migrants internationaux. Au total, 46.8 millions de migrants (43.6%) sont faiblement qualifiés, 37.5 millions (35%) ont un niveau d'éducation intermédiaire et 23 millions (21.5%) sont hautement qualifiés. Bien que la migration faiblement qualifiée prédomine en termes absolus, tant vers les pays de l'OCDE que vers les pays non-OCDE, les taux d'expatriation des migrants hautement qualifiés dépassent les taux d'expatriation globaux dans toutes les régions, reflétant ainsi la sélectivité de la migration. Les analyses économétriques des déterminants bilatéraux de la migration des personnes hautement qualifiées distinguent la migration sud-nord des migrations sud-sud. En ce qui concerne la migration vers les pays de l'OCDE, la relation entre le taux d'expatriation des personnes hautement qualifiées et le niveau de revenus des pays d'origine suit une courbe en U inversée. Cela n'est pas le cas pour la migration vers les pays non-OCDE. Les taux d'expatriation globaux ainsi que ceux des personnes hautement qualifiées vers les pays non-OCDE augmentent lorsque le niveau de revenu des pays d'origine diminue.

Mots clés: migration internationale, base de données, DIOC-E, DIOC, stock de migrants, taux d'expatriation, qualification, éducation, immigrés, émigrés, développement

INTERNATIONAL MIGRANTS IN DEVELOPED, EMERGING AND DEVELOPING COUNTRIES: AN EXTENDED PROFILE

Introduction

1. Since the late 1990s, in part due to increasing international movements, policy-makers have devoted growing attention to migration-related issues, and expectations that migration may support the economic development of origin countries has mounted. However, the quality and comparability of international data on migration have barely kept pace. In recent years, significant efforts were made to fill this gap, notably by compiling new data on migrant stocks from a wide array of origin countries. For example, the Database on Immigrants in OECD Countries (DIOC)[1], released in 2008 by the OECD, incorporates detailed information on level of education, age, gender and labour market outcomes for the population aged 15+ around the year 2000 for 28 OECD destination countries[2] and more than 200 countries or regions of birth.

2. With these data, it has been possible to describe immigrant populations in the OECD area and to capture the cumulative effect of the many movements of the past decades (OECD, 2008). Taking advantage of the information available on the educational attainment of migrants, the migration flows of the highly skilled could be depicted, confronting the conventional wisdom on the brain drain with actual data.

3. The data recently compiled on migrant stocks rely mainly on population censuses of OECD countries as their main sources. Yet, a significant share of international migration occurs outside the OECD area[3] and migrants in non-OECD countries may differ significantly from those settled in OECD countries. Focusing solely on OECD countries may therefore distort the profile of immigrants world-wide and bias the estimated impact of emigration.

4. In order to assess these differences and to provide a global and more accurate picture of migrant populations around 2000, the OECD, with support from the Agence Française de Développement (AFD) and in collaboration with the World Bank, has expanded the Database on Immigrants in OECD Countries (DIOC) to cover non-OECD receiving countries as well[4]. This extended version of DIOC is called DIOC-E, and is freely accessible on the OECD[5] and World Bank websites.

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1 http://www.oecd.org/els/migration/DIOC. See also the World Bank Website for comparable datasets : http://go.worldbank.org/RFRQAN6BO1

2 Korea and Iceland are not included.

3 Although the majority of international migrants still live in developed countries, the number of countries hosting international migrants has increased in recent years. Between 1960 and 2005, the number of countries hosting at least 500 thousand migrants more than doubled to reach 64. In 2005, it is estimated that about 75 million immigrants lived in developing countries, including 53 million in Asia, 17 million in Africa, and 7 million in Latin America and the Caribbean (United Nations, 2009).

4 See also Parsons et al. (2005) and United Nations (2008) for databases attempting to include all bilateral migrants' stocks, although without the education dimension.

5 http://www.oecd.org/els/migration/DIOC/Extended. The extended database also includes the OECD countries.

5. The extended database offers the opportunity to investigate various aspects of South-South migration and to make comparisons with South-North migration. In particular, it allows computation of emigration rates by skill level including many key destination countries outside the OECD area and is based on more accurate data on education in origin countries.

6. This paper provides a first look at DIOC-E, with the view to highlighting its potential for further research at both regional and global level. The first section presents in more detail the database and data collection process. The following section describes migrant populations by receiving and origin country. Special attention is paid to various aspects such as gender, age, educational attainment and labour force status. In section 4, new emigration rates by educational attainment levels are computed and section 5 presents an econometric analysis of the bilateral determinants of migration of the high-skilled, distinguishing for the first time South-North and South-South migration. The last section concludes.

Main findings

- DIOC-E (release 2.0) covers 89 destination countries, of which 61 are outside the OECD area. It includes information on 110 million migrants aged 15 and over by skill level, age, gender and labour market outcomes, which represents around 72% of the estimated number of international migrants worldwide. 68% of all migrants in the database live in OECD countries, whereas the remaining 32% live in the non-OECD countries included in the extended version so far.

- The data enable calculation of emigration rates of tertiary educated persons for 161 countries, which represents the largest-ever collection of estimates based on actual data (as opposed to extrapolations). Focusing on OECD destination countries only, the improvement of the underlying education data reveals that, for many countries, previous estimates significantly overestimated or underestimated emigration rates for the highly skilled. The extension of the database to non-OECD destination countries also significantly affects emigration rate estimates, notably for former USSR countries, as well as for some African countries. DIOC-E therefore makes a major contribution to improving, quantitatively and qualitatively, available estimates for emigration rates by skill level.

- The global emigration rate is 2.4%, which masks significant regional differences: Europe, Latin America and Oceania have the highest emigration rates, more than twice that of Africa, Asia and North America. Emigration rates are particularly high for small islands and less populated countries.

- In total there are 46.8 million low-skilled migrants (43.6%), 37.5 million migrants with intermediate skill level (35%) and 23 million highly skilled migrants (21.5%). Low-skilled migration still dominates in absolute terms both to the OECD and to non-OECD countries. However, the emigration rate for highly skilled persons exceeds the total emigration rate in all regions, which reflects the selective nature of migration. A striking fact is the magnitude of the global emigration rate of highly skilled persons from Africa, estimated at 10.6% (9.7% for migration to OECD countries), compared to other regions of origin and the world average of 5.4% (4.3% to OECD countries).

- Most destination countries receive mainly migrants born in the same region (about 85% in Africa, 75% in Asia, 62% in Latin America and 60% in Europe), except for countries with historical bonds to other countries out of the region and OECD settlement countries which have received, through various historical migration waves, immigrants from diverse source countries.

- In non-OECD countries on average 51% of international migrants are women, 18% are aged between 15 to 24 years and 15% are tertiary educated. Corresponding figures for OECD destination countries are 51%, 13%, 24%.

- Migrants differ widely in their socio-demographic characteristics, by region of origin and/or country of origin. Migrants from Africa are mainly low-skilled, whereas Asian migration is quite mixed (e.g. Bangladeshi-born are very low-skilled, Indian-born and Chinese-born are mostly highly skilled). On average migrants from Latin America have the lowest share of highly skilled persons (13.5%, compared to 19% for African migrants and 25.1% for Asian migrants). In nearly all countries of residence the share of tertiary educated among migrants is higher than among the native-born.

- Labour market outcomes vary significantly across countries of residence, with no systematic regional pattern. In general, differences in employment rates between native-born and foreign-born persons are much more pronounced for highly skilled persons and for women.

- The relationship between the total emigration rate and the income level of origin countries follows an inverted U-shape relationship. Highly skilled emigration rates to the OECD follow more or less the same pattern but this is not the case for migration to non-OECD countries. Indeed, both total and highly skilled emigration rates to non OECD countries steadily increase as the level of income of the origin countries decreases. In other words, for low-income origin countries, the low emigration propensity of highly skilled persons towards OECD countries is offset by a relatively high emigration rate to non-OECD countries.

- Econometric analysis confirms that the income level of origin and destination countries does not play the same role in both contexts. The impact of both the origin country's and destination country's income is more pronounced in the case of migration towards OECD countries. Second, distance more strongly affects migration between South-South pairs of countries, but also has a larger positive effect on selection in this case. Third, after controlling for origin and destination specificities, dyad-specific variables, such as a common language or a past colonial relationship, retain a strong explanatory power.

1. An extended bilateral database of international migrants: DIOC-E

7. The data collection consists in compiling information on migrants by destination country based on population censuses or population registers circa 2000. The data can be subsequently re-aggregated by country of origin, to analyse the characteristics of specific migrant groups and to estimate emigration rates by country of origin and skill level. This means that information has to be collected on two key dimensions: country of birth and educational attainment. Collecting this information in OECD countries was thus the purpose of the development of the Database on Immigrants in OECD Countries (DIOC), which includes the following seven tables (see Table 1). Because of data limitations, the extension of the data collection to non-OECD receiving countries focuses on Tables A, C and D only.

Table 1. DIOC tables by country of residence, country of birth and education

Table A	Table B	Table C	Table D	Table E	Table F	Table G
- Age - Gender - Citizenship	- Duration of stay	- Labour force status - Gender	- Occupation 2-digit level - Gender	- Detailed occupation 3-digit level	- Sector of activity - Gender	- Labour force status - Field of study

8. Between 1995 and 2004 most non-OECD countries conducted a population census, which theoretically allows collection of the information needed for this project.[6] However, collecting information on country of birth and skill level from censuses or equivalent data sources for non-OECD countries is quite demanding since most countries do not publish this information in standard tables. The data is therefore obtained through special requests to national statistical offices or direct exploitation of publicly available micro datasets such as IPUMS[7] or Redatam[8]. IPUMS provides samples of population censuses and Redatam is a software to extract specific tables from selected Latin American population censuses. Overall, the two databases provide census data for 32 different non-OECD countries with information on place of birth or nationality and education (see Box 1 for more information on definition and possible limitation of the data).

Box 1: Definitions and possible limitations applying to DIOC-E

DIOC-E (release 2.0) contains data on 89 countries of residence and covers all individuals aged 15 and over living in these countries. For most countries the place of birth is used to identify migrants, although in some cases it was necessary to rely on criteria based on nationality. The database identifies 232 countries of origin. The share of persons with unknown place of birth is less than 1% for the whole database.

Census data was used for 81 countries, population register data for four countries (Denmark, Finland, Norway and Sweden) and national labour force survey data (LFS) for Germany, the Netherlands and Israel. For India the National Sample Survey calibrated on Census data 2001 was used.

One of the major challenges in compiling these data has been to harmonize the classification of variables which are not systematically collected based on international classifications. This is particularly the case for educational attainment in non-OECD countries of residence. Education mappings for the transformation of national education categories were built in order to be in line with the International Standard Classification of Education (ISCED). Educational attainment level is interpreted according to the International Standard Classification of Education (ISCED) and aggregated in three groups: primary level (ISCED 0/1/2); secondary level (ISCED 3/4) and tertiary level (ISCED5/6). Such a harmonization was unfortunately more problematic for occupation, as many countries have specific national categorizations or semi-aggregated groupings of occupations.

Census and population register data is one of the best data sources for small population groups, such as foreign-born by origin. Nevertheless, the data may be subject to some limitations.

Firstly, persons born abroad as nationals of their country of residence may be included in the immigrant population. This would be only an issue for some countries or regions with large repatriate communities (e.g. France or the former USSR) or with large expatriate communities (e.g. United Kingdom). Another issue regarding the country-of-birth variable arises regarding the non-exhaustive list of countries surveyed. In some cases, particularly for non-OECD countries of residence, only the main countries of origin or regional groupings were available (see Table A.2 for more information). In cases where labour force survey data was used, the list of countries of origin was limited due to the application of publication thresholds.

Secondly, there is a certain degree of uncertainty on the completeness and cross-country variation in coverage for some specific groups such as undocumented migrants, short-term migrants or asylum seekers, in particular in countries where refugees do not live in fixed accommodation but in refugee camps. According to UNHCR statistics from 2009, around 2.5 million refugees (including people in a refugee-like situation) live in camps. For the countries included in DIOC-E this accounts for 760,000 refugees in 2009, of which all are in non-OECD countries, mainly in Africa, such as Kenya, Rwanda and Uganda. These persons are, *a priori*, not covered in the database.

Thirdly, it is important to emphasize that DIOC-E only contains information on migrant stocks. Consequently, the information on international migration in the database represents historical patterns of migration and not actual

6 http://unstats.un.org/unsd/demographic/sources/census/censusdates.htm

7 https://international.ipums.org/international/release_dates.shtml

8 http://www.eclac.org/cgibin/getProd.asp?xml=/redatam/noticias/paginas/7/13277/P13277.xml&xsl=/redatam/tpl/ p18f.xsl&base=/redatam/tpl/top-bottom.xsl

migration flows. Information on duration of stay, included in DIOC, was only available for a limited number of non-OECD destination countries, and therefore could not be included in DIOC-E.

Finally, education data do not allow us to control for the geographic location where the education or training was received. For that reason, one should be cautious when using the place of birth to infer the impact of international migration on countries of origin. Other authors have tried to use age at entry to infer where the diploma was obtained, although this information is only available for a limited number of non-OECD countries and the results are quite sensitive to the cut-off age retained to identify where the last diploma was obtained.

9. The first release of DIOC-E (release 1.0), which was made available in January 2010[9], covered 55 destination countries. The second release, on which this paper is based, includes 89 countries. A third and final release is scheduled by the end of 2010 which could add 10 to 20 new destination countries.

10. DIOC-E (release 2.0) allows a comparison of the size and characteristics of migrant populations in 28 OECD countries[10] and 61 non-OECD countries around 2000[11] (see Table 2 and Table A2 for more information on metadata). Compared to the OECD-only database, DIOC-E adds major destination countries such as Russia, India, Israel, Argentina and Malaysia[12]. All continents are covered, although to varying extent. Europe, North America and South and Central America are covered almost completely and Caribbean countries are also well represented. For Oceania, only Australia and New Zealand are included, but the number of immigrants in the other countries is virtually negligible.

11. One third of all Asian countries[13] are present in the database, with many of the key destination countries of the region. China, however, is not included because foreigners are not covered by the Chinese census and other potential sources of data on the foreign-born could not be obtained from Chinese statistical sources. The main Middle Eastern destination countries are not yet included but the OECD is currently working with UN ESCWA[14] to launch a new data collection for Western Asian countries. The results of this additional data collection exercise will be included in DIOC-E (release 3.0).

12. Regarding Africa, only one quarter of all African countries are included in the database so far, mainly because of the absence of reliable census data on immigrants for the period considered. The data collection process, however, is not yet finished. At least six additional African countries (Nigeria, Ivory Coast, Ghana, Mauritania, Sierra Leone, and Malawi) could be included in the third release. Thanks to cooperation with Afristat, data for some additional African countries are also expected to be compiled. It

9 www.oecd.org/els/migration/DIOC/Extended

10 In the context of this paper, the terms "OECD member countries" and "OECD area" refer to all member countries of the OECD except Chile, Israel and Slovenia, i.e. Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Japan, Luxembourg, Mexico, the Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Spain, Sweden, Switzerland, Turkey, the United Kingdom and the United States. Two other OECD member countries, Iceland and Korea, are not included in the database since data was not available. They are included in OECD member countries as origin countries, but not as destination countries.

11 It is expected that additional countries will be added in a subsequent release of DIOC-E, including several major receiving countries: Ukraine (5 million migrants), Kazakhstan (3 million migrants), Ivory Coast (2.5 million migrants), Hong Kong (2.5 million), Nigeria (about 1.1 million migrants) and the Arab States (about 30 million migrants).

12 All new OECD member countries (Chile, Israel and Slovenia) and accession countries (Estonia and Russia) are included. All countries with which the OECD has developed enhanced engagement, except China (i.e. Brazil, India, Indonesia and South Africa) are also included.

13 Middle East countries are included in the regional category Asia, but very few of them are covered so far.

14 United Nations Economic and Social Commission for Western Asia (UN ESCWA)

should, however, be noted that DIOC-E is, at present, the only source of data on the characteristics of more than 3 million international migrants living in Africa.

13. While the extension was the main goal of the new data collection, DIOC-E not only provides estimates of the size of the foreign-born populations but includes several demographic and social dimensions, such as gender, age, educational attainment, and, for a more limited set of countries, labour force status and occupation. The need to compile figures with fully comparable categories across countries led to a lower level of detail for certain variables, compared to the OECD-only database. However, the new database provides unparalleled information on the foreign-born (and native-born) populations of a wide range of countries. In particular, great effort was made to obtain comparable classifications of educational attainment across destination countries[15], in order to obtain meaningful measures of high-skilled migration.

14. The total number of immigrants in the database is 110 million (population aged 15 and over), with about 75 million living in OECD countries and 35 million in non-OECD countries. Extending the coverage to these latter countries has therefore increased the total stock of migrants in the database by almost 50%. Overall, the 89 countries included in the database represent about 55% of the world population 15 and over (China is not included), but host about 72% of the world's migrants[16].

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15 IPUMS contains the core variables for this project in their original format, and in some cases in a harmonized format. These harmonized variables are one of the strongest advantages of IPUMS, since they reduce the technical constraints of using national data for the purpose of international comparisons.

For the harmonized education variable, IPUMS use a predefined criterion of years of education, required to equal the corresponding completed level or degree. For example, a person is considered to have completed primary education if he/she has at least six years of primary schooling. Three years are necessary for lower secondary education; another three years for upper-secondary education; and at least four years for tertiary education. The main advantage of this approach is that each category of the classification has the same meaning for all countries. However, it ignores the specificities of national educational systems, notably at the tertiary level. For example, the IPUMS definition classified all persons with non-university degrees as having only secondary education.

In order to improve international comparability, a special effort has been made to link the international classification ISCED and the unharmonised education variable in IPUMS and Redatam. UNESCO mappings were available only for a limited number of countries and in most cases it was necessary to use information from other sources (Sistemas Educativos Nacionales project – OEI, World Data on Education database, IBE/UNESCO or national ministries of education).

16 The UN estimates that there were 175 million migrants in the world in 2000 (United Nations, 2009). According to these data, countries covered by DIOC-E hosted about 125 million migrants, leading to a coverage of 72% (against 47% for the OECD-only database). DIOC-E accounts for only 110 million migrants living in those countries because it covers the 15+ population (vs. total population in the UN estimates).

Table 2. Foreign-born population aged 15 and over by country of residence and region of origin, in thousands, circa 2000

Country of residence		Total population	Region of origin: Africa	Asia	Europe	North America	Oceania	South, Central America and the Carribean	Unspecified	Total	of which: OECD countries	Population with unknown place of birth	Proportion of foreign-born in the population (%)
Africa													
Gambia	GMB	775.6	83.6	..	..	..	..	..	2.8	86.4	..	..	11.1
Seychelles	SYC	60.7	1.4	2.7	0.4	-	-	-	0.9	5.5	0.4	-	9.0
Burkina Faso	BFA	7,518.1	364.0	ns	ns	ns	ns	ns	83.7	447.8	..	..	6.0
Benin	BEN	3,599.1	194.2	1.3	1.6	0.2	-	-	0.1	197.4	1.6	23.3	5.5
Guinea	GIN	3,993.1	206.7	0.8	1.9	0.2	..	..	0.2	210.1	1.3	1.5	5.3
Rwanda	RWA	4,739.7	228.2	0.5	1.3	..	0.2	..	0.1	230.3	0.6	185.1	5.1
South Africa	ZAF	30,437.0	676.2	38.0	223.1	7.9	4.1	12.2	-	961.5	226.2	..	3.2
Uganda	UGA	12,912.1	302.9	4.9	2.5	0.9	..	..	2.1	313.2	1.8	0.3	2.4
Kenya	KEN	15,910.1	311.1	ns	ns	ns	ns	ns	ns	311.1	..	..	2.0
Mali	MLI	5,292.2	93.0	0.1	1.4	0.2	..	..	4.4	99.1	1.5	..	1.9
Mozambique	MUS	881.6	0.9	12.0	1.7	0.1	-	-	0.1	14.7	1.7	..	1.7
Tanzania	TZA	18,542.3	185.3	8.0	3.2	0.7	..	..	46.5	243.7	2.4	0.1	1.3
Senegal	SEN	5,637.1	45.3	2.9	4.3	0.4	-	0.2	2.0	55.1	4.5	9.8	1.0
Asia													
Israel	ISR	4,452.2	305.9	327.3	1,040.7	44.6	2.5	50.1	..	1,771.0	264.4	1.6	39.8
Singapore	SGP	2,277.4	..	505.9	3.5	1.2	..	..	2.2	512.7	..	..	22.5
Kyrgyz Republic	USSR-KGZ	3,050.0	..	174.7	177.4	..	..	..	2.6	354.7	1.9	-	11.6
Armenia	USSR-ARM	2,433.0	0.4	167.8	99.5	0.2	..	..	0.5	268.4	7.2	..	11.0
Jordan	JOR	3,194.1	95.1	54.9	6.2	..	..	..	135.3	291.4	..	1.0	9.1
Malaysia	MYS	14,365.5	0.8	982.2	7.2	2.1	2.6	0.3	312.1	1,307.1	14.7	..	9.1
Nepal	NPL	14,072.3	..	517.9	1.1	0.2	..	..	0.4	519.5	0.6	..	3.7
Philippines	PHL	48,025.3	15.6	198.4	97.7	60.5	22.3	20.2	409.7	824.5	173.7	1,658.1	1.8
Japan	JPN	108,224.8	5.1	868.6	27.1	40.0	8.1	193.5	..	1,142.4	66.7	15.0	1.1
India	IND	662,376.9	64.6	5,778.0	16.0	3.7	5.8	..	8.8	5,876.9	12.1	..	0.9
Iraq	IRQ	10,882.5	17.5	55.8	1.9	0.2	..	..	2.3	77.6	1.7	64.8	0.7
Thailand	THA	45,982.4	..	200.5	16.9	5.3	3.0	..	2.5	228.2	30.4	108.8	0.5
Mongolia	MNG	1,577.6	..	2.1	2.7	0.3	..	..	1.3	6.4	0.3	..	0.4
Laos	LAO	2,495.0	-	7.0	0.1	0.2	-	..	-	7.3	0.2	2.9	0.3
Sri Lanka	LKA	11,713.2	0.3	15.0	1.7	0.3	0.2	..	1.2	18.6	2.9	20.5	0.2
Indonesia	IDN	139,970.8	..	5.3	0.9	..	0.5	..	11.5	18.2	3.3	38.4	0.0
Europe													
Luxembourg	LUX	356.3	5.3	3.6	117.3	1.1	0.1	1.4	0.9	129.8	110.3	1.6	36.6
Switzerland	CHE	6,043.4	61.6	93.5	1,131.2	24.5	4.2	50.1	89.0	1,454.2	910.7	250.8	25.1
Estonia	USSR-EST	1,121.6	-	8.4	234.3	0.2	-	0.1	..	243.0	3.2	8.8	21.8
Latvia	USSR-LVA	1,761.4	0.1	15.3	353.1	0.2	0.1	0.2	..	369.0	4.8	0.1	20.9
Croatia	FYUG-HRV	3,682.8	0.4	0.7	554.7	1.1	0.7	0.5	..	558.1	16.8	20.4	15.2
Sweden	SWE	6,463.9	56.5	224.7	579.7	13.7	3.1	56.1	..	933.8	446.0	0.5	14.4
Austria	AUT	6,679.4	22.4	59.0	823.1	7.6	1.8	9.7	..	923.7	461.6	0.8	13.8
Serbia	FYUG-YUG	6,321.2	0.4	1.0	858.9	0.1	0.3	0.2	..	861.0	18.4	9.3	13.6
Germany	DEU	68,113.6	177.6	965.9	5,370.2	39.1	..	52.8	1,226.5	7,832.0	3,276.0	5,272.3	12.5
Belgium	BEL	8,491.5	232.4	62.3	689.2	14.1	1.3	20.0	-	1,019.3	674.2	0.5	12.0
France	FRA	48,068.4	2,745.3	432.8	2,282.8	48.5	5.6	85.1	..	5,600.2	2,222.4	..	11.7
Belarus	USSR-BLR	9,152.4	0.4	111.6	952.0	0.2	-	0.5	..	1,064.6	30.8	4.4	11.6
Netherlands	NLD	12,733.4	213.9	323.4	529.5	14.1	8.7	291.4	39.0	1,419.9	410.6	40.3	11.2
Ireland	IRL	3,034.6	21.5	25.0	258.9	18.0	6.4	2.9	0.3	333.0	267.3	..	11.0
Greece	GRC	9,273.2	51.0	83.8	807.9	31.0	20.0	6.2	..	999.9	282.4	1.1	10.8
Slovenia	FYUG-SVN	1,663.9	0.3	0.5	162.7	0.5	0.2	0.3	..	164.4	14.3	..	9.9
United Kingdom	GBR	47,684.5	762.6	1,475.4	1,552.0	193.3	156.8	324.1	39.3	4,503.5	1,738.1	..	9.4

Note: "-" no observations; ".." below 1,000 observations; "ns" only countries of birth in Africa were surveyed;
Source: DIOC-E 2000 (release 2.0)

Table 2. Foreign-born population aged 15 and over by country of residence and region of origin, in thousands, circa 2000 *(cont.)*

Country of residence		Total population	Region of origin: Africa	Asia	Europe	North America	Oceania	South, Central America and the Carribean	Unspecified	Total	of which: OECD countries	Population with unknown place of birth	Proportion of foreign-born in the population (%)
Europe													
Russia	USSR-RUS	119,893.1	13.2	5,167.6	5,504.2	2.1	4.2	7.8	9.5	10,708.5	220.5	..	8.9
Norway	NOR	3,666.9	28.9	93.2	153.1	15.1	1.4	13.8	0.4	305.9	139.0	..	8.3
Denmark	DNK	4,358.6	26.0	96.5	177.7	9.7	1.9	7.5	..	319.3	160.0	23.1	7.4
Lithuania	USSR-LTU	2,804.0	-	11.8	185.2	0.9	0.0	0.2	..	198.2	6.7	21.9	7.1
Portugal	PRT	8,699.5	332.4	15.7	159.7	10.4	0.9	66.9	..	585.9	151.0	..	6.7
Spain	ESP	34,848.1	372.1	79.3	715.0	19.9	3.7	724.9	..	1,914.9	616.7	3.2	5.5
Czech Republic	CSFR-CZE	8,571.7	1.8	20.7	405.8	2.0	0.3	1.4	4.9	437.0	337.6	171.6	5.2
Italy	ITA	48,892.6	407.5	188.8	1,119.2	68.0	18.0	219.5	..	2,020.9	790.6	..	4.1
Hungary	HUN	8,503.4	1.8	10.3	259.7	2.5	0.2	1.0	..	275.5	65.1	-	3.2
Slovak Republic	CSFR-SVK	4,316.4	0.3	1.4	110.4	0.9	-	0.2	..	113.2	96.2	405.5	2.9
Finland	FIN	4,244.6	8.1	15.1	83.5	3.6	0.6	1.6	..	112.4	45.7	4.5	2.7
Poland	POL	31,288.4	2.0	9.6	703.4	5.8	0.3	1.1	15.5	737.7	148.4	516.5	2.4
Turkey	TUR	47,583.8	4.3	71.9	1,033.4	10.8	1.9	..	8.3	1,130.6	390.7	12.3	2.4
Georgia	USSR-GEO	3,455.6	-	20.5	46.1	-	-	0.1	-	66.8	1.2	2.5	1.9
Romania	ROU	17,581.4	..	13.3	94.6	1.0	..	..	8.5	117.4	18.6	0.8	0.7
Bulgaria	BGR	6,712.1	0.4	5.2	23.7	0.3	-	0.2	..	29.7	6.8	0.1	0.4
North America													
Canada	CAN	23,900.8	277.5	1,886.9	2,306.7	246.4	50.0	587.5	0.3	5,355.2	2,371.9	..	22.4
United States	USA	217,165.2	838.2	7,831.8	5,429.6	868.8	255.6	16,165.3	0.6	31,389.9	14,732.0	..	14.5
Oceania													
Australia	AUS	14,856.8	166.1	1,043.1	2,098.1	70.4	407.0	74.3	1.2	3,860.2	2,242.6	745.2	27.4
New Zealand	NZL	2,889.6	30.0	153.2	270.2	17.9	148.6	4.1	..	624.1	341.4	119.9	22.5
South and Central America and the Carribean													
Belize	BLZ	137.3	0.1	1.8	0.4	1.5	-	25.4	0.1	29.3	4.0	0.1	21.3
Puerto Rico	PRI	2,905.0	0.1	3.2	8.7	184.0	0.1	99.9	..	296.0	195.5	..	10.2
Costa Rica	CRI	2,593.4	0.1	4.3	7.6	7.8	-	225.5	..	245.3	17.1	..	9.5
Venezuela	VEN	15,426.7	2.2	33.8	194.2	7.8	..	907.0	..	1,145.1	201.7	12.8	7.4
Argentina	ARG	26,012.4	1.8	27.9	426.2	8.9	0.6	969.2	23.0	1,457.5	420.1	..	5.6
Paraguay	PRY	3,247.9	0.2	7.2	5.4	2.1	-	129.8	..	144.7	13.2	36.7	4.5
Trinidad Tobago	TTO	830.5	..	0.6	1.7	1.0	..	28.0	5.3	36.6	2.6	1.3	4.4
Panama	PAN	1,930.1	0.3	15.6	5.6	3.9	0.1	48.4	..	73.7	11.1	1.7	3.8
Uruguay	URY	2,364.9	0.2	1.8	40.4	1.1	0.2	35.1	0.1	78.9	39.9	..	3.3
Dominican Republic	DOM	5,657.7	0.2	2.3	8.1	2.3	-	69.5	..	82.3	11.0	356.0	1.6
Chile	CHL	11,226.3	1.2	7.3	30.5	7.8	1.2	112.2	2.4	162.6	40.3	217.0	1.5
Bolivia	BOL	5,076.7	..	2.6	6.0	3.7	0.2	50.3	2.9	65.7	19.6	..	1.3
Ecuador	ECU	8,116.6	0.3	3.5	10.5	7.1	0.2	64.6	0.9	86.9	18.1	12.5	1.1
Jamaica	JAM	1,754.1	..	1.6	3.2	2.4	..	..	7.8	15.0	5.6	3.3	0.9
El Salvador	SLV	3,797.1	-	0.5	1.3	2.3	-	25.9	0.0	30.1	5.0	..	0.8
Nicaragua	NIC	3,213.9	-	0.4	1.5	1.9	-	17.5	1.2	22.5	3.9	..	0.7
Honduras	HND	3,524.4	-	1.0	1.2	2.3	-	17.6	0.3	22.5	4.3	..	0.6
Guatemala	GTM	6,487.2	0.1	1.8	2.2	2.7	-	28.8	..	35.5	9.9	-	0.5
Brazil	BRA	119,548.9	14.8	115.3	380.0	10.0	0.4	129.7	1.0	651.2	444.2	..	0.5
Mexico	MEX	62,842.6	0.8	9.9	44.7	112.2	0.6	73.1	0.2	241.5	157.4	174.3	0.4
Peru	PER	19,054.6	0.3	6.8	16.3	6.8	0.6	29.4	..	60.3	25.3	..	0.3
Columbia	COL	28,720.2	0.5	3.7	12.5	6.3	0.6	50.0	2.0	75.6	20.1	553.7	0.3
Cuba	CUB	8,885.0	..	0.4	7.1	0.6	0.4	1.6	4.5	14.6	5.8	..	0.2
Total OECD		851,796.1	6,853.1	16,145.6	29,239.2	1,909.2	1,107.1	19,035.5	1,426.3	75,715.9	33,652.6	8,918.2	8.9
Total non-OECD		1,531,827.3	3,230.8	14,663.0	11,784.2	410.0	51.5	3,158.7	1,102.7	34,400.8	2,615.7	4,786.1	2.3
Total		**2,383,623.4**	**10,083.9**	**30,808.5**	**41,023.4**	**2,319.1**	**1,158.6**	**22,194.1**	**2,529.0**	**110,116.7**	**36,268.3**	**13,704.3**	**4.6**

Note: "-" no observations; ".." below 1,000 observations; "ns" only countries of birth in Africa were surveyed;
Source: DIOC-E 2000 (release 2.0)

2. An overview of worldwide migration circa 2000 based on DIOC-E

15. This section offers a descriptive picture of worldwide migration circa 2000 as drawn from DIOC-E (release 2.0). It first looks at the main characteristics of migrant stocks in destination countries and subsequently analyses migrant groups by country and region of origin.

2.1 Immigrant populations by countries of residence: size and characteristics

16. The extension of the database provides important insights on the geographical distribution of migrants worldwide, both in absolute and relative terms. As shown in Table 2, while a couple of OECD countries host a significant share of world migrants (USA: 31.4 million; Germany: 7.8 million; France: 5.6 million; Canada: 5.3 million), several non-OECD countries now included in the database also have very large foreign-born populations (Russia: 11 million; India: 6 million; Israel: 1.8 million). In relative terms, high shares of immigrants are recorded in several OECD countries (Luxembourg: 37%; Australia: 27%; Switzerland: 25%; New Zealand: 23%), but also among non-OECD countries: Singapore (23%), Estonia (22%), Belize (21%) and Latvia (21%). Israel, which joint the OECD in 2010, reports the highest share of immigrants among the receiving countries included in the database (40%). Some countries, however, have a very low share of foreign-born in their population (below 1%), such as Indonesia, Sri Lanka, Cuba, Colombia, Laos, Peru, Mongolia, Bulgaria and Thailand. Among OECD countries, the lowest shares of immigrants are observed in Mexico (0.4%) and Japan (1.1%).

17. A closer look at countries of origin and destination shows that a large share of migrants comes from relatively nearby countries. In the African countries currently included in the database almost 85% of migrants come from other African countries, while this percentage reaches 75% in Asia and 62% in Latin America. Europe also receives a significant share of migrants from within the region (59%). Table 3 shows the main origin countries of migrants in a selection of key destination countries and further illustrates this pattern. It also documents important exceptions that stem in particular from historical ties. DIOC-E clearly opens new possibilities to analyse regional migration systems outside the OECD-area. Box 2 provides some insights on migration within Latin America, while Box 3 discusses the case of migration in countries of the former USSR.

Table 3. Foreign-born population aged 15 and over by main countries of residence, main countries of origin and share of highly skilled, in thousands, circa 2000

Region of residence	Country of residence	Total foreign-born	of which country of birth		% of tertiary-educated
Africa	South Africa	961.5	Mozambique	254.1	0.4
			Zimbabwe	126.6	10.0
			United Kingdom	125.5	17.9
	Burkina Faso	447.8	Ivory Coast	271.6	5.8
			Mali	33.9	2.5
			Ghana	23.3	1.4
	Uganda	313.2	Sudan	114.9	0.3
			Congo, Dem. Rep. of	61.4	1.4
			Rwanda	54.9	0.3
	Kenya	311.1	Uganda	174.7	0.8
			Tanzania	46.6	1.8
			Sudan	33.9	21.9
	Tanzania	243.7	Burundi	63.4	0.3
			Mozambique	38.5	0.2
			Kenya	22.7	2.6
Asia	India	5,876.9	Bangladesh	3,509.1	1.9
			Pakistan	1,303.5	4.8
			Nepal	621.8	0.0
	Israel	1,771.0	Russia	264.1	60.1
			Ukraine	249.7	62.5
			Morocco	169.8	14.4
	Malaysia	1,307.1	Indonesia	599.2	1.4
			Philippines	112.5	3.5
			Bangladesh	55.0	6.5
	Japan	1,142.4	North and South Korea	467.4	23.1
			China	227.4	38.5
			Brazil	157.9	17.8
	Philippines	824.5	Bahrain	73.5	13.0
			United Kingdom	73.1	10.2
			United States	57.9	16.9
North America	United States	31,389.9	Mexico	8,250.9	5.4
			Philippines	1,356.7	48.6
			Puerto Rico	1,297.3	14.8
	Canada	5,355.2	United Kingdom	612.3	40.5
			China	318.1	40.0
			Italy	317.5	11.8
Europe	Russia	10,824.6	Ukraine	3,348.4	23.5
			Kazakhstan	2,265.8	18.3
			Belarus	894.1	22.0
	Germany	7,832.0	Turkey	1,188.0	3.6
			Poland	1,027.5	16.5
			Russia	929.8	17.1
	France	5,600.2	Algeria	1,210.6	15.2
			Morocco	686.3	17.0
			Portugal	567.7	4.1
	United Kingdom	4,503.5	Ireland	525.2	22.7
			India	454.5	33.3
			Pakistan	301.9	18.5
	Italy	2,020.9	Switzerland	180.2	8.2
			Germany	167.9	9.8
			Morocco	137.7	5.3
South America and the Carribean	Argentina	1,457.5	Paraguay	305.6	2.1
			Italy	215.3	5.0
			Bolivia	214.3	2.9
	Venezuela	1,145.1	Columbia	581.1	4.4
			Spain	76.1	15.8
			Portugal	53.1	3.6
	Brazil	651.2	Portugal	211.9	9.3
			Japan	66.7	9.6
			Italy	54.6	18.8
	Puerto Rico	296.0	United States	183.7	21.0
			Dominican Rep.	59.1	10.7
			Cuba	19.8	37.8
	Costa Rica	245.3	Nicaragua	184.9	2.8
			Panama	8.4	12.6
			United States	8.3	14.6
Oceania	Australia	3,860.2	United Kingdom	1,007.7	24.2
			New Zealand	316.0	21.3
			Italy	217.7	6.4
	New Zealand	624.1	United Kingdom	207.7	33.1
			Samoa	42.8	8.9
			Australia	42.0	30.7

Note: *In the Kenyan Census only African countries of birth were suveyed.
Source: DIOC-E 2000 (release 2.0)

Box 2: Regional migration in Latin America

The number of migrants originating from Latin America (including South and Central America and the Caribbean) is about 22 million, which represents 20% of all foreign-born persons included in DIOC-E. Overall, 5 million immigrants were living in Latin America in 2000, of which around 3 million were born in another country within the region. The main countries of residence within Latin America for persons born in the region are Argentina (969 thousand) and Venezuela (907 thousand). Most migrants living in another country within the region originate from Colombia (679 thousand), Paraguay (333 thousand), Chile (263 thousand) and Bolivia (254 thousand). Latin American migrants living in Latin America are mostly low-skilled - only 11% hold a tertiary degree - whereas migrants from Latin America living in other regions of the world tend to be better educated. The major migration corridors within Latin America are Colombian-born in Venezuela, Nicaraguans in Costa Rica and migrants from neighbouring countries in Argentina (Chart 1).

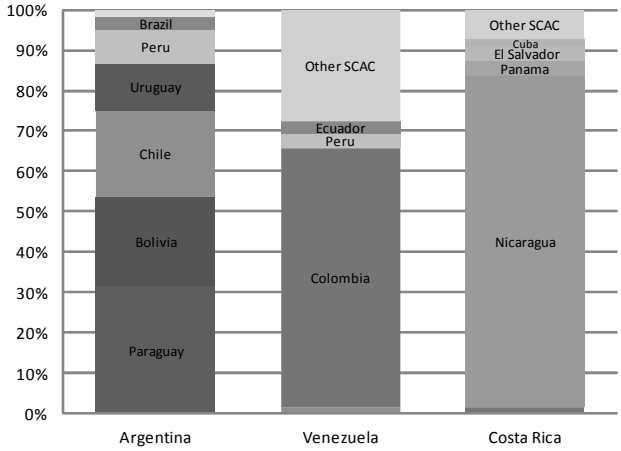
Colombian migration to Venezuela began on a large scale in the 1970s because of the oil boom, and began to decline as the boom ended in the 1980s. Migration flows during the 1990s are primarily explained by the severe economic crisis and escalating internal violence in Colombia. Migrants from Colombia are mainly in the working age population (82% are between 25 and 65 years old), hold primary education (74%) and are mostly employed in unskilled jobs (30% in elementary occupations and 20% in craft and trade works).

Migration to Costa Rica is mainly from Nicaragua. Most persons migrated in the 1990s, when Nicaragua experienced an economic downturn. Over the past decades, these flows established a core permanent population. The Nicaraguan-born population in Costa Rica is gender balanced (51% of women), low-skilled (88% have primary degrees and only 3% completed university) and work mainly in elementary occupations (51%). Migration to Costa Rica is also seasonal, for harvesting coffee and other crops. Bilateral agreements regulate legal permission to work for Nicaraguans. Most of the trans-border migration is based on work permits or 30-day visitor's visa. Therefore, many migrants cross back every 30 days to renew authorization. Nevertheless, in this part of Latin America, much of the intra-regional migration is irregular, since many persons overstay the visa period and border control is relatively difficult in the region notably due to large temporary, family, and commercial flows.

Argentina is the major destination for migrants from bordering countries such as Paraguay, Bolivia and Chile. Before its 2001 economic crisis, Argentina offered more job opportunities and higher wages than neighbouring countries, from which it attracted a large number of migrants. In addition, political instability generated by military dictatorships in Paraguay (1954-1989), Chile (1973-1990), and Uruguay (1973-1985) and the escalating violence in Peru during the 1980s, also contributed to the increase of the number of migrants from bordering countries. The foreign-born persons living in Argentina are mostly of working age (74% are between 25

and 65 years old), women (53%) and low educated (81% have only primary education). Migrants from the region are essentially employed in domestic services, tourism and construction, with the exception of the Bolivian-born, who are for the most part agricultural workers in the sugar harvests.

Chart 1: Share of Latin American migrants of all intraregional migrants in Argentina, Venezuela and Costa Rica, by country of origin, population aged 15 and over, circa 2000



Source: DIOC-E 2000 (release 2.0)

Box 3: Regional migration in the former USSR

Intraregional mobility dominates international migration for countries of the former USSR. Around 94% of all migrants in the region originate from other countries of the former USSR. The main receiving countries are Russia with around 10 million migrants and Belarus with 1 million migrants (Table 4). In the Russian Federation, most of the foreign-born persons originate from Ukraine and Kazakhstan. In all other receiving countries, Russian-born persons account for the major share of foreign-born persons. Overall, the largest emigrant populations in the region of the former USSR are represented by persons born in Ukraine (3.7 million), Kazakhstan (2.4 million), Russia (1.3 million) and Belarus (1 million).

Due to historical reasons, determining migration patterns within this region is not easy and interpretations have to be made with caution, since the country of birth does not necessarily reflect the country of nationality and origin of migrants in the former USSR. Before 1991, persons moved within the USSR to a large extent for family reasons or for employment. After 1991, intraregional migration was mainly dominated by so-called “repatriates”, i.e. many persons moved back to their “country of origin”. After 1995, migration of persons of Russian origin to Russia decreased significantly, whereas flows of “repatriates” to other countries persisted, although at a relatively low level. In the Russian Federation in 2002 for instance, 63% of foreign-born persons migrated before 1992, 28% from 1992 to 2002 and only 9% of all foreign-born persons were recent immigrants, i.e. foreign-born persons who arrived between 1997 and 2002.

In general, the distribution by country of origin of the immigrant population has not changed significantly over time, but the relative importance of the different countries has changed. In the Russian Federation, for instance, around 50% of all recent immigrants, i.e. foreign-born persons who arrived between 1997 and 2002, originated mainly from Kazakhstan (27%) and Ukraine (23%), whereas the share of persons born in Ukraine who arrived before 1992 was around 39% and the share of persons from Kazakhstan only 18%. Further, migration from countries outside the former USSR is still minimal. Only 4% of all foreign-born persons living in Russia originate from countries outside the region. These persons mainly come from Germany (131 700 immigrants), China (58 900 immigrants) and Poland (30 200 immigrants).

Migration within the region is quite specific as most migrants are women of working age. On average, around 20% of migrants hold a tertiary degree, but this percentage reaches 30% for migrants coming from Estonia, Latvia and Turkmenistan. Inversely, 28% of migrants from Belarus and Lithuania are low-skilled.

International migration out of the region is important for some migrant groups. This is the case notably for Russian-born migrants and Lithuanian-born migrants, of which 58% and 55% respectively live outside the region. Out of the nearly 1.8 million Russian-born in this situation, around 50% live in Germany, 15% in the United States and 15% in Israel. Ukrainian-born persons living outside the region (1 million, but only 22% of all Ukrainian emigrants) tend to go to different countries, and notably to Poland for about a third of them. Israel and the United States are also important destinations with 23% of Ukrainian migrants each.

Table 4: Foreign-born population aged 15 and over by country of origin and country of residence in the former USSR region, circa 2000

	Countries of residence									
Countries of origin	Armenia	Belarus	Estonia	Georgia	Kyrgyz Republic	Lithuania	Latvia	Russian Federation	**Total**	**Total in DIOC-E**
Former USSR	22.8	-	-	-	-	-	-	-	22.8	114.0
Armenia	-	4.7	0.6	11.8	0.6	0.6	0.8	370.9	389.9	474.5
Azerbaijan	139.8	12.6	1.4	5.5	1.9	1.3	2.4	728.1	893.0	951.7
Belarus	0.5	-	14.8	1.0	2.5	55.7	68.8	894.1	1,037.2	1,242.2
Estonia	-	3.7	-	0.1	-	1.0	3.1	60.1	68.1	105.4
Georgia	64.4	7.6	1.5	-	3.6	0.9	1.5	547.5	627.0	758.2
Kazakhstan	1.1	63.3	3.8	1.5	75.7	6.4	6.9	2,265.8	2,424.5	2,857.2
Kyrgyz Republic	0.1	4.8	0.6	0.2	-	0.6	1.0	404.2	411.5	449.6
Lithuania	0.1	15.8	2.1	0.2	-	-	24.6	79.7	122.4	271.3
Latvia	0.1	13.2	4.2	0.2	-	7.9	-	90.5	116.1	179.7
Macedonia	0.3	6.9	0.9	0.4	0.7	0.8	1.8	248.4	260.2	374.7
Russian Federation	-	656.0	183.0	33.6	155.7	93.5	204.7	-	1,326.4	3,158.3
Tajikistan	0.3	4.9	0.4	0.1	21.8	0.5	0.6	324.7	353.3	370.9
Turkmenistan	1.2	4.9	0.4	0.2	2.0	0.4	0.7	152.6	162.2	169.7
Ukraine	3.5	217.2	24.9	9.1	13.5	19.6	44.1	3,348.4	3,680.1	4,730.8
Uzbekistan	1.6	13.3	1.1	0.7	60.3	1.6	2.2	774.5	855.2	955.9
Total	235.9	1,028.9	239.3	64.6	338.1	190.6	363.1	10,289.4	12,749.8	17,050.0
Other countries of birth	32.5	35.7	3.7	2.2	16.6	7.6	5.9	419.2	523.4	92,952.7
Total foreign-born population	268.4	1,064.6	243.0	66.8	354.7	198.2	369.0	10,708.5	13,273.2	110,116.7

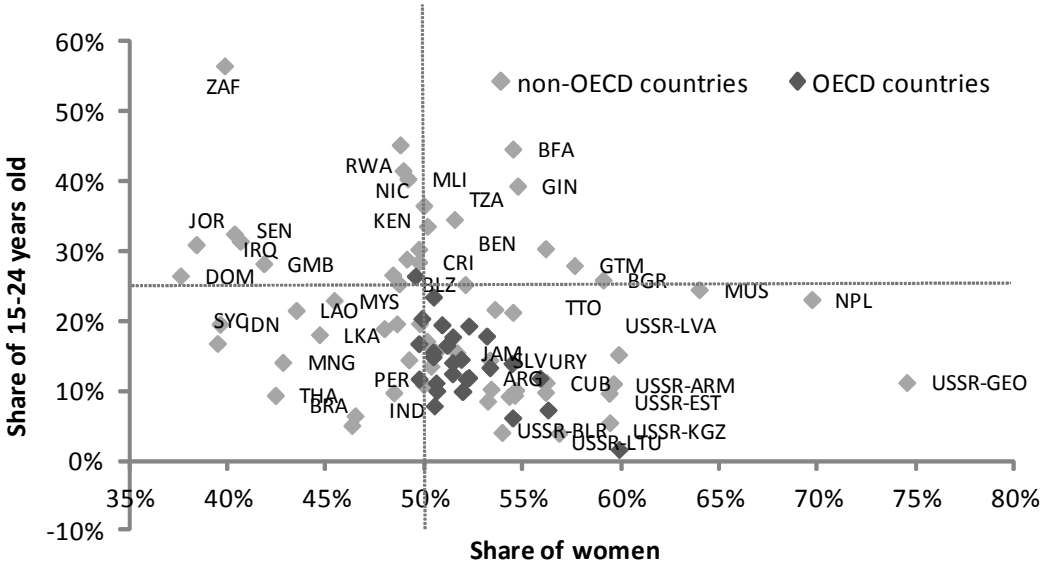
Source: DIOC-E 2000 (release 2.0)
Note: "-" no observations

18. In most receiving countries, the age structure of immigrants differs significantly from the age structure of the native-born. In general, the foreign-born are overrepresented in the working age group (25-64) and underrepresented in the age groups 15-24 and 65+ (Chart 2). This can be explained by the

relative importance of labour migration, by the average age of immigrants entering through family reunification programmes, as well as by the age selection associated with return migration occurring in relation to retirement. In general, migrants tend to be younger in non-OECD countries. There are, however, significant differences in the age structure of the foreign-born across receiving countries: in Eastern and Central European countries, for example, the share of older immigrants (aged 65 and over) is in general much higher than the share of young immigrants (aged 15-24), whereas in most African countries young foreign-born persons make up the largest group.

19. Chart 2 also presents the gender distribution of migration by country of residence. On average 51% of migrants are women, slightly less in non-OECD countries (49%) and significantly more in selected countries, notably in the former USSR and Nepal. In contrast, women represent a particularly low share of migration to South Africa, Indonesia, Jordan and the Dominican Republic. There are indeed large variations in the share of migrant women across non-OECD countries, with no clear relationship with the age distribution of migrants, which would be interesting to further investigate.

Chart 2: Share of 15-24 year old persons and women of foreign-born population aged 15 and over by country of residence, circa 2000

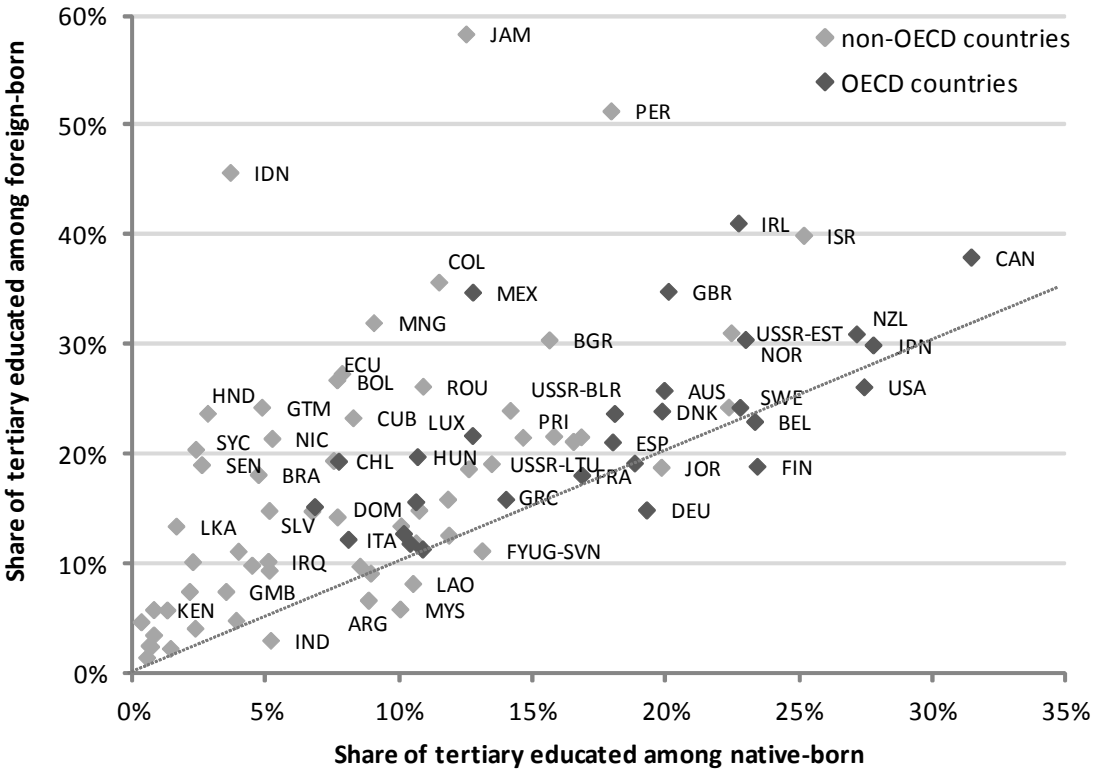


Note: On average, for the 89 countries included in DIOC-E, 25% of the native-born is aged 15 to 24
Source: DIOC-E 2000 (release 2.0)

20. With regard to the educational attainment of migrants, Chart 3 reveals that in virtually all destination countries the share of migrants having tertiary education is higher than that of the native-born. This was already well documented for OECD countries (see OECD, 2008), but the extended database shows that it is also true for non-OECD countries. There are however some exceptions, such as Germany and Finland, as well as Malaysia, Laos, Argentina and India. The higher skill levels of migrants in most receiving countries reflect the selective nature of migration, either due to self-selection or to selective immigration policies. This feature tends to be more pronounced in OECD countries, where 24% of migrants are tertiary educated, compared to about 15% in non-OECD countries.

21. In almost all destination countries, however, the absolute number of migrants that have at most a primary education level is higher than that of those who hold a university diploma. Notable exceptions include Canada, Israel, Ireland, Japan, Norway, New Zealand and countries of the former USSR. In total there are 46.8 million low-skilled migrants (43.6%), 37.5 million migrants with intermediate skill level (35%) and 23 million highly skilled migrants (21.5%).

Chart 3: Share of tertiary educated among native-born and foreign-born persons aged 15 and over by country of residence, circa 2000



Source: DIOC-E 2000 (release 2.0)

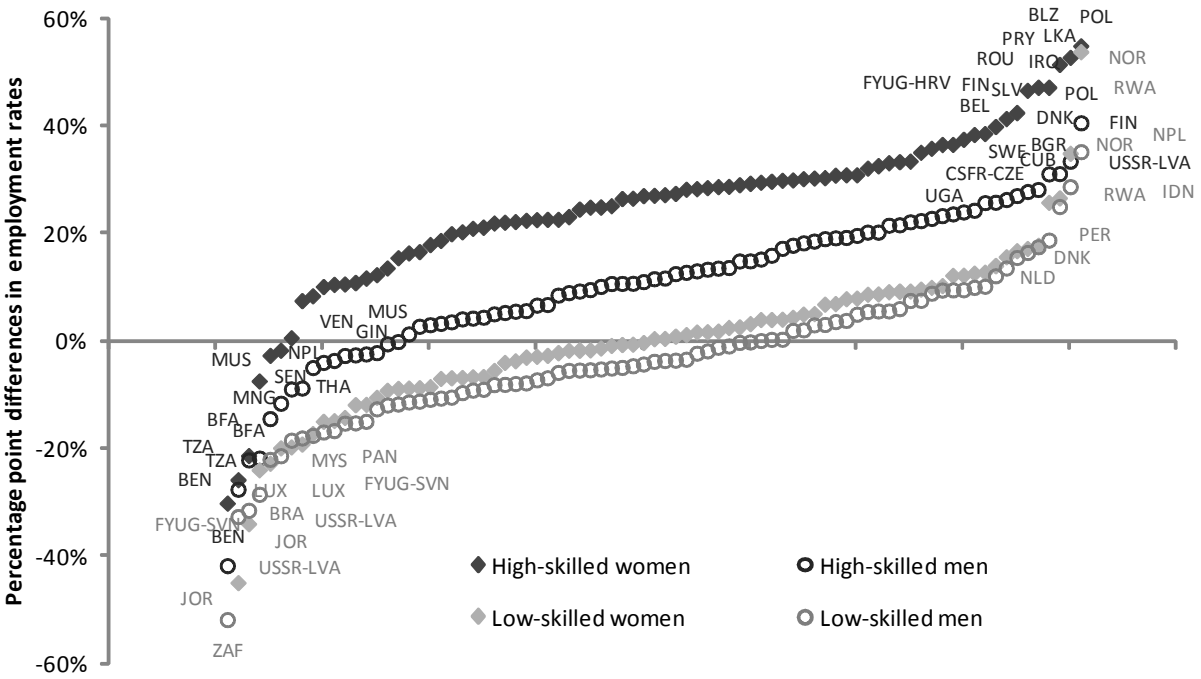
22. Comparing the labour market status of foreign-born and native-born in different destination countries provides a unique perspective on the integration outcomes of migrants in different contexts. The labour market outcomes of foreign-born and native-born persons differ significantly across countries of residence, but there is no systematic regional pattern. Among OECD countries, for example, native-born tend to have higher employment rates than foreign-born notably in Northern European countries**,** whereas in Luxembourg and Southern European countries, foreign-born fare better than native-born. In non-OECD countries immigrants face specific difficulties to integrate into the labour market compared to natives, notably in Africa (excluding South Africa), where the average employment rate of migrants is 66%, 7 percentage points below the figure recorded for the native-born. This finding would need to be further investigated, but one explanation may be, for example, the importance of humanitarian migration, as well as the concentration of migrants in urban areas where the public sector still comprises a big part of formal employment. The situation is different in Latin America, where the gap between migrant and native-born employment rates is reversed (the average employment rates for non-migrants and migrants are respectively 56.2% and 61%).

23. Disaggregating the immigrant populations by gender and educational attainment shows that differences between native-born and foreign-born in employment rates are much more pronounced for women than for men, as well as for the high-skilled (Chart 4). In almost all receiving countries included in DIOC-E, highly skilled native-born persons have higher employment rates than foreign-born persons with the same educational attainment level. This is partly due to the fact that foreign qualifications are often not recognised or not transferable to the labour market of the destination country. In addition, language proficiency is more important for high-skilled jobs, and can hinder successful careers in highly skilled occupations. Since DIOC-E includes information on occupations by country of birth and skill level, this issue could be further investigated[17].

[17] See Dumont and Monso (2007) for a first cross-country analysis of this question, partly based on DIOC data and therefore applied to OECD destination countries only.

24. On the other hand, with regard to low-skilled persons, the overall differences between native-born and foreign-born seem to be smaller both between migrants and non-migrants but also between genders. For around half of the countries of residence, low-skilled foreign-born persons have higher employment rates than their native-born counterparts.

Chart 4: Differences in employment rates between native-born and foreign-born persons aged 15 and over, by gender, educational attainment and country of residence, circa 2000



Source: DIOC-E 2000 (release 2.0)

2.2 The perspective of origin countries: emigrants and their characteristics

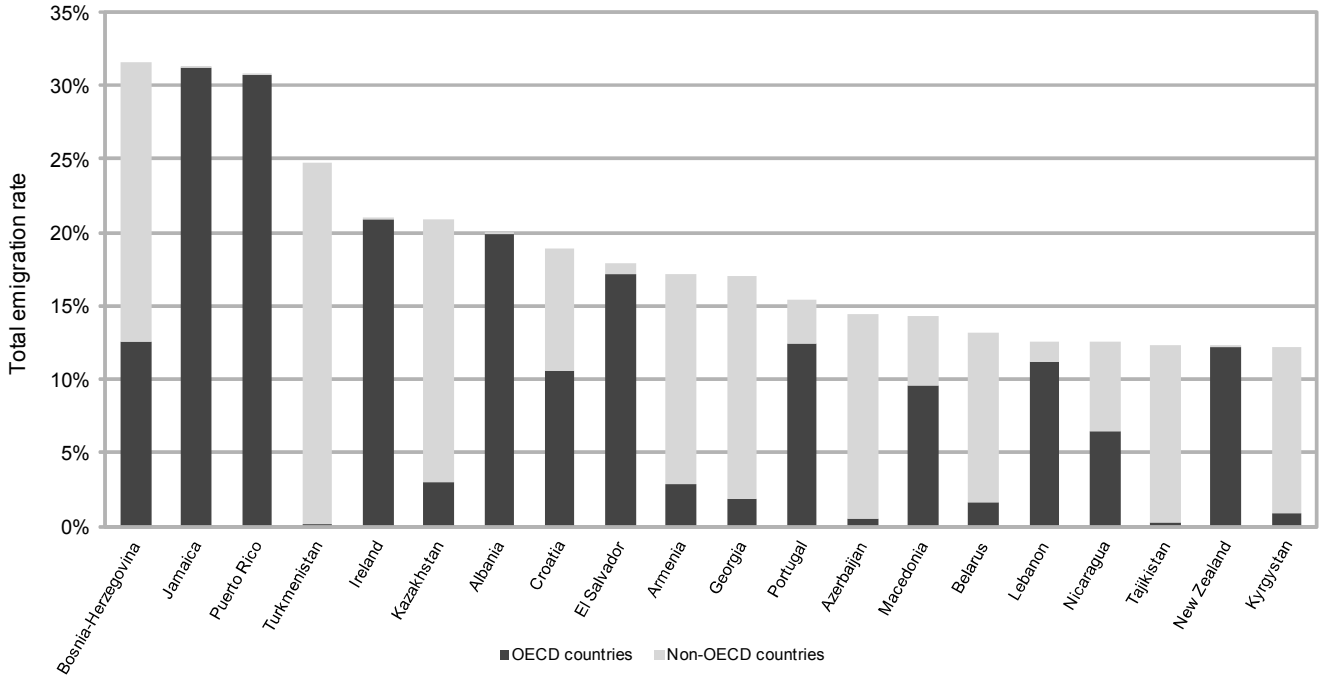
25. A key feature of DIOC-E is the possibility to aggregate emigrants by country of origin and to examine their characteristics. First of all, as shown in Table 5, most migrants in the database come from Europe (37%), Asia (28%) or Latin America (20%). African migrants account for only 9% of the overall migrant stock, while North America and Oceania together account for a mere 3%. Compared to the OECD-only version, the number of Asian migrants has almost doubled. This is especially due to better coverage of the Bangladesh-born and Pakistan-born populations with the inclusion of India. A large part of these movements occurred in the context of the partition of British India in 1947 but persisting migration from Bangladesh to India has also contributed to increase the migrants stock since.

26. Despite the fact that virtually all Latin American countries are now included as destination countries, the coverage of Latin American migrants has only increased modestly (by 3 million, or 17%), which reflects their concentration in the United States. This is particularly striking for Mexican migrants, whose number is virtually unchanged after the extension of DIOC to non-OECD countries. As shown in Table 6, the largest emigrant population in absolute numbers remains Mexico with over 8 million migrants living mainly in the United States. Ukraine comes second, with 4.7 million migrants, followed by Bangladesh (3.8 million), the United Kingdom (3.4 million), Germany (3.4 million) and Russia (3.1 million).

27. The 20 countries with the highest emigration rates are shown in Chart 5, distinguishing OECD and non-OECD destinations. The pattern of destinations differs largely across countries of origin. In some countries, such as Jamaica, Puerto Rico or Ireland, migrants go almost exclusively to OECD countries, while in others, such as Turkmenistan or Azerbaijan, migrants move only to non-OECD countries. Looking at the distribution of emigration rates for countries with more than one

million inhabitants, there is a non-negligible number of countries for which the numbers of emigrants to OECD and non-OECD countries are relatively similar. For most origin countries, however, the pattern of destinations is much more unbalanced: in 86 countries, emigrants to OECD countries are more than twice as numerous as emigrants to non-OECD countries, while the reverse is true in 35 countries. While the attractiveness of OECD countries stands as a key feature of the global migration system, it appears that, for many migrants, non-OECD countries constitute very common destinations. Is migration to low and middle income destination countries a second best choice or an independent strategy based on geographical, cultural proximity and historical ties? Are there any differences in terms of the development impact according to the destination of migration? The availability of this new extended bilateral migration database clearly opens up new opportunities to further investigate the determinants of destination choices of migrants.

Chart 5: Origin countries with the highest emigration rates by OECD and non-OECD destinations, population aged 15 and over, circa 2000



Source: DIOC-E 2000 (release 2.0)

Table 5: Characteristics of foreign-born persons aged 15 and over by regions and main countries of origin, circa 2000

Region of origin	Population (thousands)			Women (%)	Young (15-24) (%)			Primary-educated (%)			Tertiary-educated (%)		
	Men	Women	Total		Men	Women	Total	Men	Women	Total	Men	Women	Total
Africa[1]	5,378	4,706	10,084	46.7	16.2	18.2	17.1	52.8	58.3	55.3	21.1	16.6	19.0
North Africa	2,123	1,781	3,904	45.6	7.8	8.1	7.9	52.3	57.7	54.8	20.0	16.0	18.2
Sub-Saharan Africa	2,958	2,738	5,696	48.1	22.7	25.2	23.9	54.5	59.6	57.0	21.6	17.0	19.4
Asia	15,178	15,756	30,935	50.9	15.1	14.5	14.8	37.0	44.0	40.5	26.5	23.7	25.1
Bangladesh	2,064	1,790	3,855	46.4	10.0	8.5	9.3	65.7	84.7	74.6	5.6	2.0	3.9
China	1,205	1,308	2,513	52.1	12.1	11.5	11.8	35.2	39.4	37.4	38.9	33.9	36.3
India	1,263	1,359	2,621	51.8	12.3	14.0	13.2	29.9	47.2	38.9	49.4	34.3	41.5
South America and the Carribean	11,159	11,036	22,195	49.7	19.5	16.1	17.8	57.3	53.5	55.4	12.6	14.5	13.5
Mexico	4,652	3,716	8,368	44.4	23.7	19.7	21.9	70.6	68.2	69.5	5.3	6.5	5.8
North America	1,077	1,242	2,319	53.5	16.1	14.1	15.0	19.7	20.2	20.0	43.4	40.3	41.7
Oceania	563	595	1,159	51.4	15.9	16.1	16.0	27.6	30.7	29.2	28.9	29.8	29.3
Europe[2]	19,395	21,628	41,022	52.7	10.0	9.1	9.5	35.2	40.5	38.0	23.9	21.1	22.5
EU 27	10,833	12,217	23,050	53.0	8.5	8.0	8.2	36.3	41.5	39.1	25.7	22.2	23.8
Other Europe	8,384	9,225	17,609	52.4	11.8	10.4	11.1	33.8	39.1	36.6	21.5	19.7	20.6
Unspecified	1,276	1,244	2,520	49.4									
Total	54,026	56,207	110,233	51.0	14.6	13.3	13.9	42.0	45.2	43.6	22.3	20.6	21.4

Note:

1. North Africa and Sub-Saharan Africa do not add up to total Africa due to the existence of individuals of unspecified African origin.

2. Similarly, for Europe, EU27 and Other Europe do not exactly add up to total Europe due to people of unspecified European origin.

"Unspecified" corresponds to individuals not classified in any of the top-level regions of origin.

Source: DIOC-E 2000 (release 2.0)

Table 6: Characteristics of the foreign-born population aged 15 and over from the 30 main countries of origin, circa 2000

	Number of emigrants (thousands)	Women (%)	Young (15-24) (%)	Tertiary-educated (%)	Tertiary-educated of native-born population in origin country (%)
Mexico	8,368.4	44.4%	21.9%	5.8%	12.8%
Ukraine	4,730.1	53.2%	9.4%	26.2%	..
Bangladesh	3,854.5	46.4%	9.3%	3.9%	..
United Kingdom	3,488.6	51.8%	6.2%	33.8%	20.1%
Germany	3,401.1	56.6%	14.1%	28.8%	19.3%
Russia	3,158.3	57.2%	12.4%	27.4%	15.8%
Kazakhstan	2,856.9	53.1%	18.2%	18.2%	..
Italy	2,723.9	47.3%	1.9%	11.9%	8.1%
India	2,621.4	51.8%	13.2%	41.5%	5.2%
China	2,512.9	52.1%	11.8%	36.3%	..
Poland	2,264.4	55.5%	10.8%	21.9%	10.4%
Turkey	2,134.8	47.5%	10.0%	7.1%	6.8%
Phillipines	2,054.0	61.0%	11.7%	44.3%	10.6%
Pakistan	1,992.6	46.3%	5.9%	13.7%	..
Morocco	1,679.6	44.8%	12.3%	14.2%	..
Portugal	1,556.7	49.0%	5.5%	6.7%	7.7%
Vietnam	1,549.4	50.3%	12.4%	23.0%	..
Bosnia-Herzegovina	1,431.7	51.4%	11.9%	11.2%	..
Columbia	1,367.2	54.6%	13.0%	16.1%	11.5%
Algeria	1,330.2	47.7%	4.3%	16.5%	..
Puerto Rico	1,304.1	52.9%	12.2%	14.9%	14.6%
Belarus	1,242.0	56.1%	6.1%	23.2%	14.2%
United States	1,221.4	52.1%	19.9%	43.2%	27.4%
France	1,204.7	55.9%	11.4%	34.4%	16.9%
Serbia Montenegro	1,157.4	49.3%	12.2%	12.1%	..
Romania	1,144.1	53.2%	10.9%	24.1%	10.9%
Canada	1,089.6	55.4%	9.5%	40.1%	31.5%
Spain	1,074.4	53.6%	4.5%	17.2%	18.0%
Indonesia	996.6	47.8%	22.0%	14.1%	3.7%
South Korea	985.8	57.9%	16.3%	43.8%	..

Note: ".." no data available
Source: DIOC-E 2000 (release 2.0)

28. As already noted, the overall stock of migrants is gender balanced: the share of women among migrants is 51% overall, which is close to the world population average of 50%. There are however significant differences across continents, and even wider ones when looking at specific regions or countries. Women are particularly overrepresented among North American and European migrants, while they are much underrepresented among African migrants, especially North-Africans (Table 5).

29. There are also large differences in the age structure of the migrant populations across regions of origin. Overall, younger migrants (aged 15-24) make up about 14% of the total 15+ migrant population. The share of youth is by far highest among Sub-Saharan African and Mexican migrants (more than 20%), while it is lowest among North African or European migrants (less than 10%). These large differences reflect both differences in the demographic structure of flows and changes in the relative weight of the different origin countries in global migration. For example, the large share of youth among Sub-Saharan African migrants illustrates the recent dynamic of intra-regional migration. In contrast migration from Southern European countries peaked several decades ago, which implies a much smaller share of young migrants. Massive migration in the context of specific historical events may also have contributed to shape the age structure of migrants, as is the case for example for people born in Algeria (most of whom are living in France) or people born in Pakistan and Bangladesh (most of whom are living in India).

30. The age structure of migration can also be affected by the nature of the migration movements. For instance temporary or circular migration will generate a very different age structure of the migrant population compared to settlement migration. In this regard it would be interesting to further investigate

and compare migration from Indonesia (mainly to Malaysia), from Mexico (mainly to the United States) and from Kazakhstan (mainly to the Russian Federation), which all indicate large shares of young migrants in very different contexts.

31. Regarding the educational attainment of migrants, there are significant differences across origins. Overall, about 44% of migrants only have only a primary education level and 21% are tertiary educated, but the regional figures range from 20% primary and 42% tertiary for North American migrants to 55% primary and 14% tertiary for Latin American migrants. There is also a large heterogeneity within regions, even for neighbouring origin countries. Indian and Bangladeshi migrants, for example, are strikingly different in terms of education. While more than 40% of Indian migrants have a tertiary education, this is only the case for about 4% of the Bangladesh-born. In this example, several factors are at play, which are also valid more generally. First, there is obviously an age effect: more recent (or younger) migrants tend to be better educated because they belong to generations which generally have had better schooling opportunities. Second, the main countries of destination of migrants also matter, as some countries have very selective migration policies while others do not. In the above case, the share of Bangladeshi migrants that are tertiary educated is overall very low, but varies widely: less than 2% in India, more than 45% in the United States. In general, the emigrant populations with the highest share of tertiary educated live mostly in the United States, Canada and the United Kingdom.

32. These examples illustrate the benefits of extending the coverage of this database to non-OECD countries. Broader coverage reveals the often overlooked historical and country-specific nature of the formation of migrant populations in developing and emerging countries. It also highlights the selectivity of migration from the poorest areas to the richest countries. This issue is further elaborated in the following sections.

3. New emigration rates and "brain drain" estimates

33. DIOC and DIOC-E provide information on persons by country of birth for more than 200 countries of origin, which allows calculation of emigration rates by gender, age and educational attainment for a large number of countries. This section presents new estimates of global emigration rates and "brain drain" (the emigration rate of persons holding tertiary degrees) to OECD and non-OECD countries. The emigration rate of a given origin country *i* in a given year is defined as the share of the native population of country *i* residing abroad at this time:

$$m_i = M_i/(M_i+N_i)$$

where M_i is the emigrant population from country *i* living abroad, and N_i is the native non-migrant population of country *i*. Similarly, the emigration rate of the tertiary educated is the share of high-skilled natives living abroad:

$$m_{i3} = M_{i3}/(M_{i3}+N_{i3})$$

where M_{i3} and N_{i3} are respectively the number of tertiary educated emigrants and native non-migrants.

34. In order to compute emigration rates for highly skilled people, two types of information are therefore necessary: (i) the number of emigrants by skill level and country of origin, (ii) the native population by education level in the countries of origin. Most of the time, however, due to the lack of appropriate data, emigration rates are calculated without separating the native-born and foreign-born populations in origin countries, approximating the native non-migrant population by the total resident population of origin countries P_i, i.e. including immigrants (P_{i3} for tertiary educated).

35. The extension of the database on immigrants provides a unique opportunity to improve emigration rate estimates. The new emigration rates for the highly skilled presented in this paper differ from previous calculations due to three improvements. First, DIOC-E includes non-OECD receiving countries, which triples the number of destination countries from 28 to 89, leading to a much more diverse set of countries and a much larger number of immigrants than the OECD-only dataset. Since virtually no country holds reliable (and comparable) information on its population living abroad, estimates of M_i are derived from data on immigrants living in a more or less narrow set of countries, usually OECD countries, which host about 50% of world migrants. Previous estimates based on DIOC or

the Docquier-Marfouk database were based on this restriction (e.g. Dumont and Lemaitre, 2005; Docquier et al., 2006, OECD, 2008). With DIOC-E, we considerably extend the coverage of destination countries, and are therefore able to greatly improve the estimation of M_i.

36. Second, previous calculations of "brain drain" used the education dataset of Barro and Lee (2001) to determine the number of tertiary educated persons in the countries of origin. In this paper, the underlying education data of origin countries is mainly derived from DIOC-E itself, since it provides direct estimates of the educational structure of the population for 89 countries. The education data in DIOC-E seems to be more reliable than previous efforts to gather information on the skill level in many different countries, since extensive adjustments to international classifications were made in order to obtain internationally comparable education data. Nevertheless, for the other countries, we rely on two additional sources of data. The first is the revision of the Barro and Lee database (2010), which is considerably improved in both coverage (146 instead of 107 countries) and reliability compared to the previous version. This dataset is used for 62 countries. The second one is the Lutz et al. (2007) database covering 120 countries, which is applied to 10 additional countries covered neither by DIOC-E nor the new Barro-Lee data. In total, we are able to calculate emigration rates for tertiary educated persons for 161 countries, which represents the largest collection of "brain drain" estimates based on actual data (and not extrapolations) until now.

37. The third improvement of DIOC-E is the possibility to distinguish foreign-born and native-born persons for many origin countries (those included as destination countries in DIOC-E). Our final set of estimates comprises two versions of the total emigration rates and two versions of the emigration rates for the highly skilled: one that includes immigrants in the native-born population of the countries of origin, i.e. uses the approximation with the total resident population ($m'_i = M_i/(M_i+P_i)$, labelled version 1), and one that makes the distinction between native residents and immigrants ($m_i = M_i/(M_i+N_i)$, labelled version 2), which is more accurate but only available for a subset of countries.

Table 7: Emigration rates by income groups and regions of the countries of origin, population aged 15 and over, circa 2000

	Global emigration rates		Emigration rates to OECD countries		Emigration rates to non OECD countries	
	Total (%)	Tertiary-educated (%)	Total (%)	Tertiary-educated (%)	Total (%)	Tertiary-educated (%)
World	2.38	5.44	1.65	4.29	0.76	1.26
High income	3.05	3.80	2.73	3.50	0.33	0.32
Upper-middle income	4.41	6.91	3.98	6.20	0.46	0.82
Lower-middle income	2.02	6.67	1.38	5.05	0.66	1.80
Low income	1.73	6.28	0.61	3.79	1.13	2.11
Africa	2.00	10.56	1.37	9.67	0.64	1.09
Asia	1.16	4.32	0.60	3.45	0.57	0.94
Europe	5.80	7.81	4.18	5.55	1.76	2.54
Latin America	5.70	8.79	4.95	7.88	0.83	1.07
North America	0.92	1.38	0.76	1.20	0.16	0.19
Oceania	4.52	7.21	4.37	7.00	0.17	0.24

Note: Income groups according to the World Bank classification of 2000.
Source: DIOC-E 2000 (release 2.0)

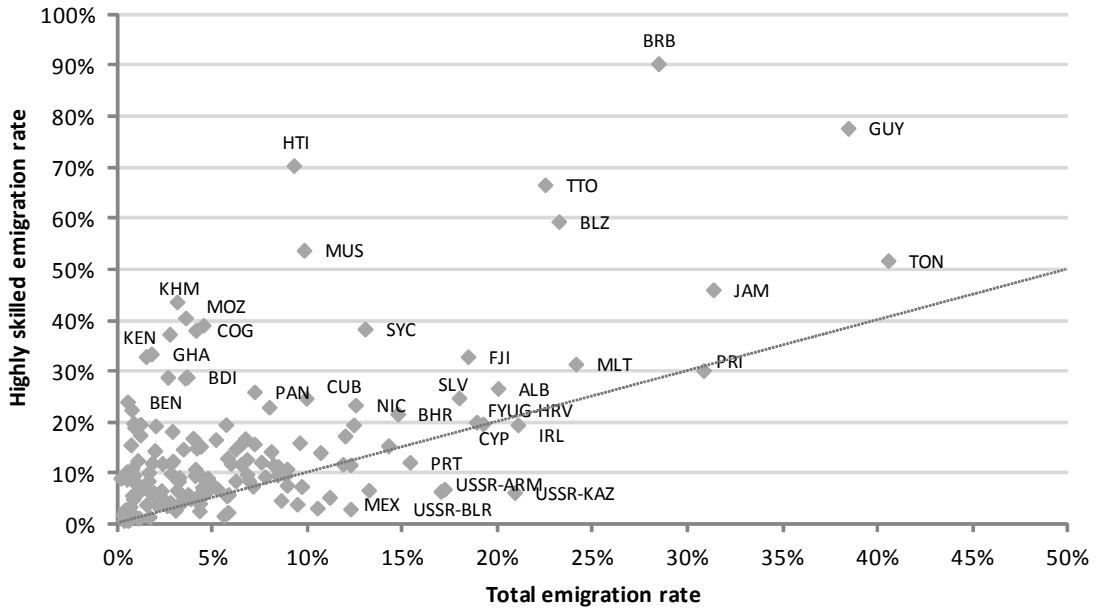
38. Table 7 gives an overview of emigration rates by regions and income groups in 2000. The global emigration rate of 2.4% (all skill levels) masks significant regional differences: Europe, Latin America and Oceania have the highest emigration rates, while Africa, Asia and North America have migration rates less than half that of the former regions. As shown in Table A1, however, total emigration rates vary largely across countries even within the same region.

39. In all regions, the emigration rate for the tertiary educated is significantly higher than the total emigration rate. As shown in Chart 6, this is also true for a large majority of individual countries. The difference between the highly skilled emigration rate and the total emigration rate is especially high for African and Asian countries. A noteworthy fact is the high emigration rate of highly skilled persons born in Africa (10.6%) compared to other regions of origin of the world (5.4% on world average). Relatively high emigration of highly skilled persons born in Latin America is also observed at 8.8%. Corresponding figures for migration to the OECD are respectively 9.7% and 7.8% for persons born in Africa and Latin America compared to 4.3% for total migration.

40. In general, the highest rates of highly skilled migration are observed for the smallest and/or poorest countries. A couple of countries have emigration rates for the highly skilled above 50% – Barbados, Guyana, Haiti, Trinidad and Tobago, Belize, Mauritius and Tonga – meaning that more tertiary educated people born in those countries live abroad than in the country itself. On the other hand, several countries have very low highly skilled emigration rates, most of them being very populated and/or high income countries, like the United States, Japan, Saudi Arabia and China.

41. Emigration rates can also be calculated by gender. Global migrant stocks are more or less gender-balanced, including among the high-skilled. However, since women still face an unequal access to tertiary education in many less developed countries, it appears that tertiary educated women have higher emigration rates (see Table A.1). This result confirms findings of previous studies (see Dumont et al., 2007) showing that the difference in emigration rate between high-skilled women and men is particularly high for the poorest countries of origin.

Chart 6: Total emigration rates and emigration rates for highly skilled persons aged 15 and over by country of origin, circa 2000

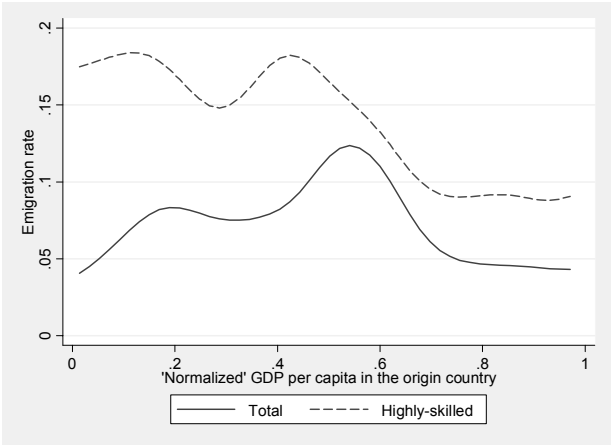


Source: DIOC-E 2000 (release 2.0)

42. When looking at the differences in emigration rates by income groups, two facts stand out. First, the relationship between the total emigration rate and the income level of origin countries follows an inverted U-shape relationship: total emigration rates are very low for low income countries, higher for lower-middle and upper-middle income countries, and decrease again for high income countries (although they remain higher than for low and lower-middle income countries). Second, this pattern is different for the migration rates of the tertiary educated, where no large differences in emigration rates for the three groups of developing and emerging countries is observed, while high income countries have noticeably lower emigration rates. This pattern of the relationship between the level of development of the country of origin and the total emigration rate, as well as the emigration rate of highly skilled is illustrated for all

destination countries in Chart 7. This chart presents kernel regression estimates for emigration rates with GDP per capita of the origin countries "normalized" to the US GDP.

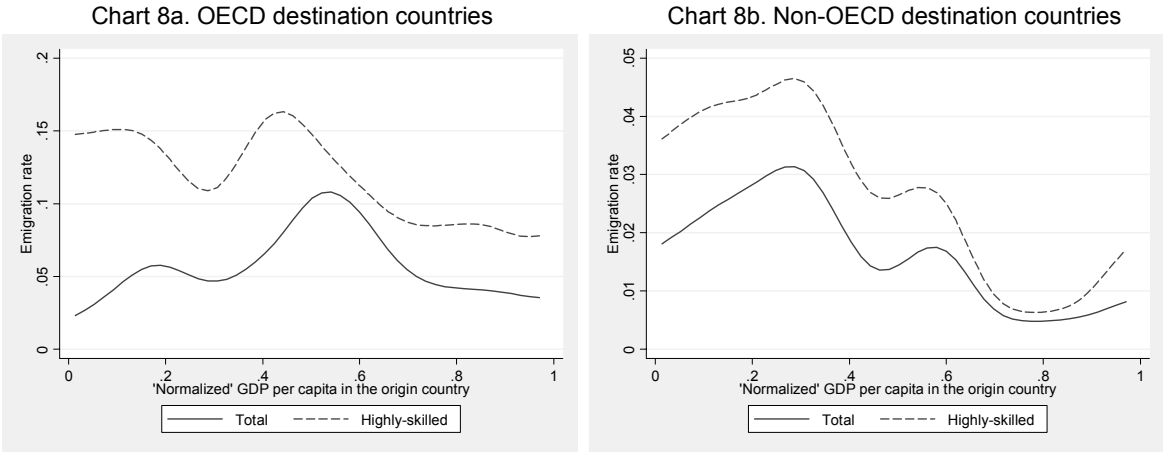
Chart 7: Total emigration rate and emigration rates of highly skilled by "normalized" GDP per capita of the origin country[(a)], circa 2000



Note: Gaussian kernel with a bandwidth of 0.07.
[(a)] GDP per capita (1985-2000) divided by the US GDP per capita.
Source: DIOC-E 2000 (release 2.0), authors' calculations

43. These results can be further refined by disaggregating destinations into OECD vs. non-OECD countries. The kernel regression estimates in Chart 8 clearly portray the differences between the destination countries regarding the relationship between emigration rates and the income level of the origin countries. The estimates for OECD destinations show similar results as for all destinations, whereas in particular it appears that both total and highly skilled emigration rates to non-OECD countries steadily decrease with the level of income of the origin countries, with a much steeper gradient for the highly skilled emigration rate. In other words, for low income countries, the low emigration propensity of high-skilled persons towards OECD countries is offset by a relatively high emigration rate to non-OECD countries for the highly skilled. Chart 8b also enables to identify the emigration of highly skilled persons from rich countries of origin to less developed ones, with the increase of the right end side of the dotted line.

Chart 8: Total emigration rate and emigration rates of highly skilled by "normalized" GDP per capita of the origin country[(a)] by OECD and non-OECD destination countries, circa 2000

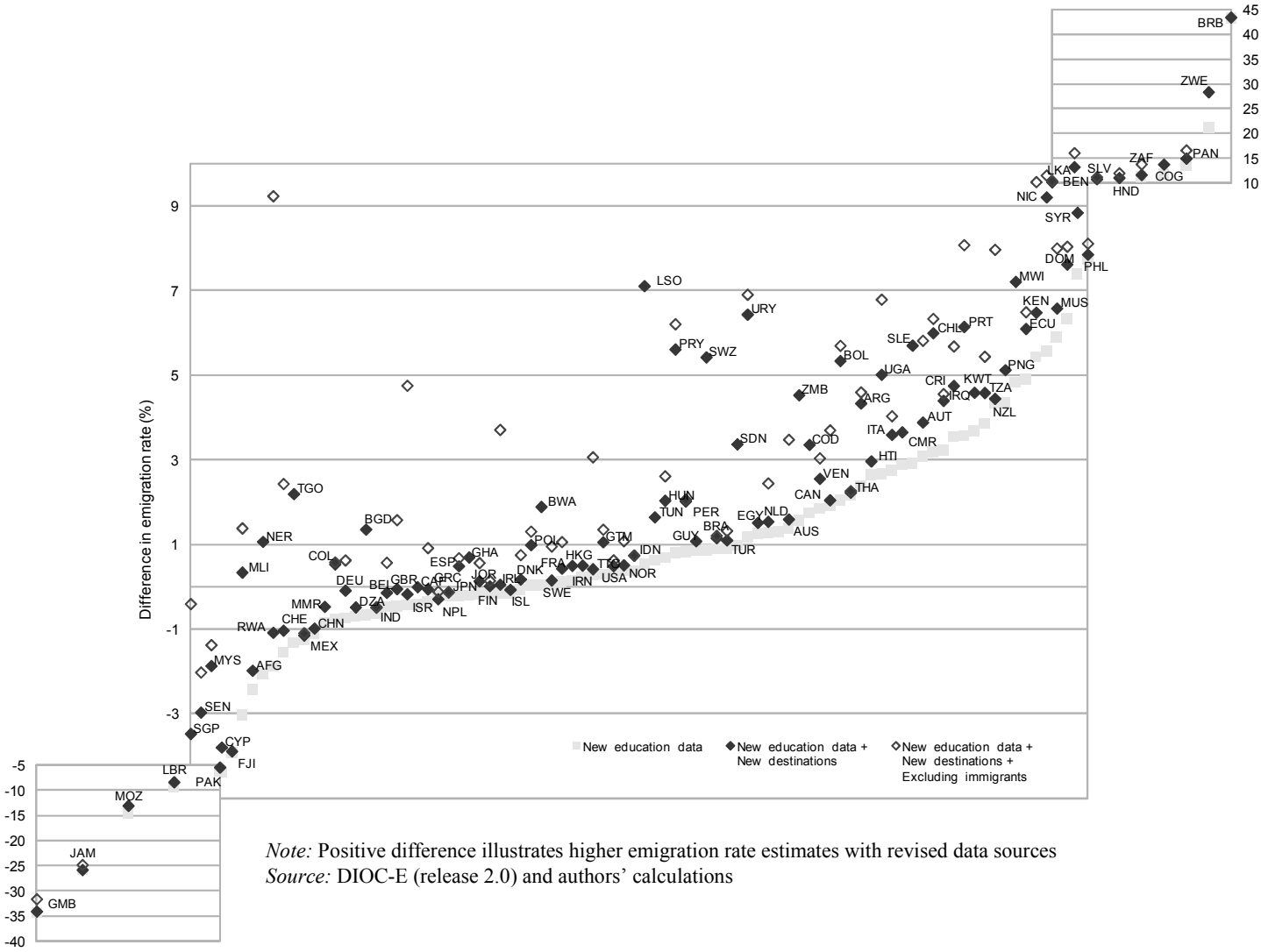


Note: Gaussian kernel with a bandwidth of 0.07.
[(a)] GDP per capita (1985-2000) divided by the US GDP per capita.
Source: DIOC-E 2000 (release 2.0), authors' calculations

44. Focusing on OECD destination countries only, the improvement of the underlying education data reveals that previous estimates vastly overestimated the highly skilled emigration rate of some

countries (e.g. Gambia, Jamaica, Mozambique, Liberia), while it was underestimated for others (e.g. Barbados, Zimbabwe, Panama, Congo, South Africa). The extension to non-OECD destination countries has a significant impact on the highly skilled emigration rates of former USSR countries, as well as some African countries (especially those with large migrant populations living in South Africa). Finally, subtracting immigrants from the resident population for the calculation of emigration rates only makes a significant difference in a couple of countries, which happen to have both large enough immigrant populations and a sufficient number of emigrants. This is for example the case of Rwanda, Israel, Australia or Switzerland. Chart 7 compares the new "brain drain" estimates to the previously published figures based on the OECD-only DIOC (see OECD, 2008). Overall, the improvement of education data represents the main source of change. Overall, emigration rates for the highly skilled are increased by more than 20% in 52 countries and decreased by more than 20% in 9 countries (see Annex Table A.3 for more details by individual countries).

Chart 9: Comparison of emigration rates for highly skilled persons aged 15 and over based on different data sources and ways of calculation by country of origin circa 2000



Note: Positive difference illustrates higher emigration rate estimates with revised data sources
Source: DIOC-E (release 2.0) and authors' calculations

4. Determinants of highly skilled migration: unilateral and bilateral estimates

45. This section examines more systematically the determinants of highly skilled emigration rates in order to shed more light on the differences between North-South and South-South migration patterns. We first look at the determinants of unilateral emigration rates, and then turn to the estimation of the covariates of bilateral rates.

4.1 Unilateral estimates

46. For the analysis of unilateral migration propensity, we slightly deviate from the definitions given above and work with a logistic transformation of the highly skilled emigration rate defined previously, $\log[m'_{i3}/(1-m'_{i3})]$. This transformation allows expansion of the range of the variable from (0, 1) to (- inf, + inf) and simplifies into the log of a simple ratio of the number of skilled emigrants to the skilled resident population.[18] Following Docquier et al. (2007), highly skilled emigration rates can be decomposed into two components: the total emigration rate and the ratio of the proportion of skilled emigrants by the proportion of skilled non-migrant residents:

$$\log[m'_{i3}/(1-m'_{i3})] = \log(M_{i3}/P_{i3}) = \log(M_{iT}/P_{iT}) + \log[(M_{i3}/M_{iT})/(P_{i3}/P_{iT})]$$

For a given country i, the first component gives an indication of the global emigration propensity for this country, while the second component indicates the education gap between emigrants and residents, which represents the level of selection of migration from that particular country.

47. As we have seen above, emigration rates for the highly skilled vary a lot across countries, in particular due to income differences and to the destinations considered. Both the total emigration rate and the selection ratio can explain a high level of the emigration of skilled persons. These two variables exhibit a strong negative correlation when only OECD destinations are considered. The correlation is however much weaker for non-OECD destination countries, and emigration rates for the highly skilled are in this case more correlated with the total emigration rates. It is therefore particularly helpful to use this decomposition and to investigate separately the empirical covariates of each component.

48. Drawing on the existing empirical literature, we consider five groups of variables as potential determinants of emigration rates for the highly skilled (see Annex Table A.4 for more information on sources and basic descriptive statistics for these variables). The first determinant is the level of development of the origin country, which is expected to affect negatively the highly skilled emigration rate, at least for the case of South-North migration. The variable used here is the log of the GDP per capita (PPP) averaged over the period 1985-2000. Another option would be the share of tertiary educated natives, but the two variables are highly correlated (75%).

49. The second set of variables includes the total population and land area of the origin country (both in logs). The size of the country is expected to affect emigration rates negatively. Population is averaged over 1985-2000. Reverse causality from emigration to population could be a concern, which would dictate using total native population (i.e. including emigrants) as an explanatory variable instead of the resident population. In practice, however, both variables are highly correlated and choosing one or the other would hardly change a digit to the estimated coefficients.

50. Geographic characteristics are captured by two variables: whether the country is landlocked and whether it is an island. The first one is expected to have a negative sign, because landlocked countries tend to have poor access to international transportation networks, while the second one should be positive since islands might suffer more rapidly from limited resources and rising population pressure.

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18 In what follows, in order to maximise the number of observations, we focus on the more broadly available measure of the emigration rate, which does not subtract immigrants from the resident population of the origin countries.

51. Language variables (English, French and Spanish as the official language) are included as a proxy for the potential ease of finding employment opportunities in the labour markets of destination countries, as these three languages are spoken by a large share of the world population. This is expected to have a stronger effect for tertiary educated migrants, since they potentially work in occupations where language proficiency is crucial.

52. Political stability is measured by the number of years of war the country has suffered between 1950 and 2000 and a variable of religious fractionalisation. Those two variables should measure two dimensions of an essential push factor. Finally, the variable "restrictions to the mobility of women" measures both social inequality and migration costs in the country of origin. It should affect differently the total and highly skilled emigration rates, since incentives and resources to escape those restrictions are probably higher for skilled people.

53. Two different sets of results are presented in Table 8. The first set considers migration from non-OECD countries to the OECD area, while the second focuses on South-South migration, i.e. migration from non-OECD countries to other OECD countries. For each set of results, three estimations are presented. The first column directly estimates the covariates of the emigration rate for the highly skilled, while in the next two columns the independent variables are respectively the total emigration rate and the selection ratio.

Table 8: Unilateral OLS regression of the determinant on emigration rates for the highly skilled, total emigration rates and the selection ratio, population aged 15 and over, circa 2000

	Non OECD → OECD countries			Non OECD → Non OECD countries		
	Highly skilled emigration rate (1)	Total emigration rate (2)	Selection (3)	Highly skilled emigration rate (4)	Total emigration rate (5)	Selection (6)
GDP per cap. 1985-2000 (log)	-0.306***	0.315**	-0.622***	-0.045	0.051	-0.097
	(0.107)	(0.121)	(0.094)	(0.152)	(0.171)	(0.119)
Population 1985-2000 (log)	-0.176*	-0.239**	0.063	-0.330**	-0.218	-0.105
	(0.090)	(0.108)	(0.070)	(0.138)	(0.142)	(0.088)
Area (log)	-0.111*	-0.084	-0.027	0.072	-0.025	0.095
	(0.060)	(0.082)	(0.052)	(0.138)	(0.144)	(0.059)
Island	0.613**	0.626*	-0.014	-0.467	-0.742	0.275
	(0.245)	(0.320)	(0.270)	(0.531)	(0.537)	(0.260)
Landlocked	-0.884***	-1.066***	0.182	0.716*	1.014***	-0.315
	(0.225)	(0.291)	(0.221)	(0.380)	(0.349)	(0.303)
Official lang. English	0.741***	0.085	0.657***	-0.860**	-1.141***	0.290
	(0.215)	(0.262)	(0.207)	(0.355)	(0.377)	(0.229)
Official lang. French	0.615***	-0.211	0.827***	-0.143	-1.025***	0.881***
	(0.228)	(0.300)	(0.204)	(0.333)	(0.391)	(0.275)
Official lang. Spanish	0.790***	0.893***	-0.103	0.382	0.214	0.179
	(0.167)	(0.248)	(0.199)	(0.247)	(0.302)	(0.188)
Years of war 1950-2000 (log)	0.188**	0.210*	-0.022	-0.156	-0.244	0.085
	(0.084)	(0.109)	(0.085)	(0.162)	(0.161)	(0.126)
Religious fractionalisation	1.310***	0.112	1.198***	1.918***	1.216*	0.683
	(0.390)	(0.490)	(0.366)	(0.598)	(0.693)	(0.433)
Restrictions to women mobility	-0.219	-0.981***	0.763***	-0.872*	-0.882*	0.027
	(0.254)	(0.358)	(0.235)	(0.519)	(0.464)	(0.252)
Constant	3.302**	-1.952	5.254***	0.111	-1.437	1.476
	(1.501)	(1.926)	(1.552)	(2.060)	(2.526)	(1.824)
Observations	133	133	133	133	133	133
Adjusted R-squared	0.54	0.49	0.53	0.19	0.22	0.13

Note: Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1
Tukey and Mexico are included in the non-OECD category
Source: DIOC-E 2000 (release 2.0)

54. In general, for the South-North regressions (Model 1 to 3), the coefficients have the expected signs and the overall fit is relatively good, while significant coefficients are rare for the South-South model and the fit is much poorer (Model 4 to 6). Several results from the South-North model are worth commenting. First, the level of development of the origin country negatively affects the propensity of tertiary educated individuals to emigrate, but this is due to the strong selection effect. Indeed, the total emigration rate is higher for richer countries, but the richer the origin country, the lower the share of highly skilled people among the emigrants. This can be interpreted in two (non mutually exclusive) ways: (i) OECD destination countries apply much more selective policies to migrants from the poorest countries; (ii) the costs of emigrating from a poor country are so prohibitive that only the better educated manage to leave. The coefficients for the size of the origin country (population and area) have the expected signs, with no significant selection effect operating through these variables. The same is true for the "island" and "landlocked" variables, for which the effect on highly skilled emigration rate is similar to that on the total emigration rate.

55. On the contrary, most of the impact of the French and English language variables on highly skilled emigration rates operates through the selection ratio. This indicates that emigrants from English- and French-speaking countries are strongly selected. This is however not the case for the Spanish language variable: Spanish-speaking countries have more highly skilled emigration, because of the importance of total emigration, but not because their emigrants are particularly selected. This difference between the different language effects could be explained by the fact that French and English are official languages in many countries (especially in Africa) with relatively few native speakers apart from the educated elite, while Spanish is broadly spoken in countries where it is the official language. Another possible explanation could be related to the fact that French and English speaking destination countries receive proportionally more foreign students who are likely to stay after completion of their study. Finally, when looking at migration from Spanish speaking countries it is necessary to recall the importance of the Latin American migration to the United States, notably from Mexico, which is mainly low-skilled. A more systematic analysis of the differences in the selectivity of migration according to the main official language of the countries of origin would be necessary to disentangle and evaluate these different types of arguments.

56. The conflict variable has a moderate effect, and is not associated with emigrant selection. Religious fractionalisation is more significant, but all of its impact on highly skilled emigration is mediated by the selection effect. Finally, the restrictions to women's mobility seem to have no effect on the highly skilled migration, because of two countervailing effects: one significantly negative on the total emigration rate and one significantly positive on the selection ratio. Briefly speaking, in countries where the mobility of women is restricted, emigrants are much less numerous but they are strongly selected, which conforms to the intuition.

57. Focusing now on the differences between the South-North and South-South results for the emigration rate for the highly skilled, we find that only the country size and religious fractionalisation variables have similar impacts. Differences of development levels across countries do not lead to different emigration rates or selection ratios. While insular countries do not retain their specificity, the landlocked variable changes the direction of influence: migrants from these countries tend to migrate more than others to non-OECD countries, although this effect is less strong for skilled migrants.

58. Important differences occur for the language variables. The emigration rate for the highly skilled is now lower for migrants from English-speaking countries, because of a negative effect on the total emigration rate. There is no significant effect on the emigration rate of the highly skilled for French-speaking countries, due to significant effects of opposite signs on the total emigration rate and the selection ratio. Finally, there is no effect of the Spanish language[19].

[19] Even when language has no impact on the emigration rate, it has surely a significant influence on the choice of the destination country.

59. Overall, while the different variables together explain almost 60% of the inter-country variance in highly skilled emigration rates from non-OECD countries to the OECD area, they explain only 25% of the variance of emigration rates towards non-OECD countries.

4.2 Bilateral estimates

60. In order to refine the previous results, we explore the potential role of the specific characteristics of destination countries and go beyond the OECD vs. non-OECD distinction. An analysis of bilateral emigration rates and selection ratios is introduced in the following, exploiting the full information in DIOC-E.

61. The methods and variables considered are mostly similar to those of the unilateral analysis, but several adjustments are needed. The dependent variable is defined for each origin-destination couple as the log of the ratio of the emigrant population from country i living in j to the resident population of country i, so that the sum of the bilateral ratios for each origin country is the unilateral measure used above. The selection ratio is defined as above, and the three dependent variables satisfy the following equation:

$$\log(M_{ij3}/P_{i3}) = \log(M_{ijT}/P_{iT}) + \log[(M_{ij3}/M_{ijT})/(P_{i3}/P_{iT})]$$

Both the global emigration rate and the selection ratio are now specific to each origin-destination couple.

62. An important issue in the bilateral approach is that most of the observations in the database are zeros, i.e. there exists no migration between the two countries considered. When all origins and all destinations are taken into account, 52% of the observations are zero (24% for all origins and OECD destinations only). This is of course normal and reflects the fact that most countries in the world only host immigrants from a limited number of origins. The use of a log specification drops the zero observations from the sample, which is likely to result in biased estimates of the variables of interest. In order to avoid this, we use the slightly transformed figures $M'_{ij}=M_{ij}+1$ in the OLS estimations.

63. Another possibility to deal with this issue is to explicitly model the potential selection using a Heckman regression, but this requires finding a valid instrument, i.e. a bilateral variable that influences the probability of observing emigrants from i to j but not the number of emigrants itself. In a somewhat similar set-up, Beine et al. (2009) have suggested using the presence of a diplomatic representation of country j in country i as an instrument. This variable would be appropriate to explain the real "zeros", i.e. cases where there are actually no migrants from country i in country j. For some countries, however, the data comes from (large) samples where small cells have a lower probability of inclusion or from data sets where not all origin countries are detailed and where origin countries are aggregated in origin regions. In order to account for these cases, we use the share of migrants from unidentified origin countries (i.e. the "other" category and the broad regional groups) in the foreign-born population as an additional instrument. In addition to the variables used in the unilateral model, the bilateral formulation allows to use destination-specific variables, such as the level of development and size of the destination country, as well as bilateral variables, such as the distance between each pair of countries, or whether they have had a colonial relationship. We also estimate a model including only the bilateral variables, along with a full set of origin and destination country dummies. In this latter case, when estimating the Heckman model, we only use the diplomatic representation instrument due to the colinearity between the destination dummies and the share of migrants of unidentified origins.

64. Similarly to what has been done in the unilateral estimations, we estimate two different models: one with only non-OECD origin countries and OECD destinations, and one restricted to non-OECD origin and destinations countries.

65. Results are presented in Table 9 (models without origin and destination dummies) and Table 10 (models with origin and destination dummies). Starting with the model with both unilateral and bilateral variables (i.e. without country dummies), the OLS and Heckman regressions provide a relatively similar picture, although there are significant differences for several variables. Since the OLS estimates are biased in the presence of selection, we discuss mainly the results from the Heckman model. For both South-North and South-South migration, the level of development of the origin countries has a significant

impact on the emigration of the high-skilled: the poorer the origin country, the higher the emigration rate for the highly skilled. This effect is however stronger in the case of migration to OECD countries than for South-South migration, mainly because total migration is more sensitive to income level[20].

66. Other things being equal, richer and larger destination countries host more migrants in general but also more highly skilled migrants. Distance between the origin and destination countries has a negative impact on the bilateral tertiary emigration rates, despite a significant positive effect on selection. As expected, distance has more impact in the case of South-South migration. On the other hand, a common language or the existence of a colonial relationship in the past has a positive impact on global and skilled emigration, with little effect on the selection ratio.

67. Compared to the unilateral model, language variables lose their impact on the emigration rate for the highly skilled in the South-North model, although the positive selection effect remains for French and English. In the South-South case, the highly skilled emigration rate is negatively affected by the English variable, because its negative impact on the total emigration is not fully offset by the positive effect on selection, as is the case for the French and Spanish variables.

68. Religious fractionalisation has a similar impact in both models as was already the case in the unilateral regressions: it increases skilled emigration through a positive effect on selection, but also through more emigration in the case of South-South pairs of countries. Finally, restrictions to women's mobility have zero net effect on the highly skilled emigration rate for both South-North and South-South migration, although they positively affect the skill content of migration.

69. Controlling for a full set of origin and destination country dummies (Table 10), a key difference appears between South-North and South-South migration. While the income differential has a negative impact on emigration (skilled and total) in the former case, there is no such relationship for South-South migration. This means that once migration policies of destination countries and other national idiosyncrasies are controlled for, the income differential between origin and destination countries does not affect emigration propensity in the South-South case. On the other hand, for migration to OECD countries, country pairs with higher income differences have on average smaller bilateral stocks of migrants. Finally, the colonial variable has a positive impact on both total and skilled emigration, comparable to the one observed in the previous models.

70. To sum up, several robust differences between the determinants of South-North and South-South skilled emigration can be noted. First, the income level of origin and destination countries does not play the same role in both contexts. The impact of both the origin country's and destination country's income is indeed much more pronounced in the case of migration towards OECD countries. Second, distance affects more strongly migration between South-South pairs of countries, but has also a larger positive effect on selection in this case. Third, after controlling for origin and destination specificities, dyad-specific variables, such as a common language or a past colonial relationship, retain a strong explanatory power.

[20] The impact of the origin country's income on selection is similar for South-North and South-South flows.

Table 9: Bilateral OLS and Heckman regressions of the determinants on emigration rates for the highly skilled, total emigration rates, and the selection ratio (without origin and destination dummies), population aged 15 and over, circa 2000

	Non OECD → OECD countries			Non OECD → Non OECD countries			Non OECD → OECD countries			Non OECD → Non OECD countries		
	Highly skilled emigration rate	Total emigration rate	Selection	Highly skilled emigration rate	Total emigration rate	Selection	Highly skilled emigration rate	Total emigration rate	Selection	Highly skilled emigration rate	Total emigration rate	Selection
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
GDP per cap. 1985-2000 (log) – Origin	-0.352***	0.286***	-0.637***	-0.472***	0.214***	-0.687***	-0.311***	0.282***	-0.593***	-0.150***	0.498***	-0.648***
	(0.058)	(0.074)	(0.022)	(0.039)	(0.049)	(0.014)	(0.038)	(0.040)	(0.022)	(0.046)	(0.056)	(0.029)
GDP per cap. 1985-2000 (log) – Destination	1.379**	1.585**	-0.206	0.724***	0.874***	-0.150***	2.440***	2.729***	-0.290***	0.883***	0.812***	0.071
	(0.509)	(0.598)	(0.134)	(0.087)	(0.108)	(0.030)	(0.082)	(0.085)	(0.048)	(0.088)	(0.106)	(0.054)
Population 1985-2000 (log) – Origin	-0.265***	-0.165***	-0.100***	-0.679***	-0.587***	-0.092***	-0.275***	-0.203***	-0.072***	-0.408***	-0.249***	-0.159***
	(0.051)	(0.054)	(0.021)	(0.031)	(0.039)	(0.011)	(0.034)	(0.035)	(0.020)	(0.043)	(0.052)	(0.027)
Population 1985-2000 (log) – Destination	0.024	-0.045	0.069	-0.060	-0.105	0.045	0.630***	0.637***	-0.007	0.540***	0.443***	0.097***
	(0.325)	(0.376)	(0.067)	(0.073)	(0.097)	(0.030)	(0.034)	(0.035)	(0.020)	(0.049)	(0.059)	(0.030)
Area (log) – Origin	-0.026	-0.015	-0.011	0.003	0.034*	-0.031***	-0.052**	-0.082***	0.030**	0.089***	0.054	0.035**
	(0.024)	(0.030)	(0.008)	(0.012)	(0.017)	(0.006)	(0.024)	(0.025)	(0.014)	(0.028)	(0.034)	(0.017)
Area (log) – Destination	0.650***	0.754***	-0.104**	0.336***	0.436***	-0.100***	0.359***	0.400***	-0.041***	0.197***	0.358***	-0.161***
	(0.203)	(0.233)	(0.043)	(0.059)	(0.079)	(0.024)	(0.025)	(0.026)	(0.015)	(0.047)	(0.057)	(0.029)
Distance (log)	-0.946***	-1.501***	0.555***	-1.094***	-1.530***	0.436***	-0.677***	-1.143***	0.466***	-1.525***	-2.053***	0.528***
	(0.181)	(0.203)	(0.044)	(0.071)	(0.092)	(0.034)	(0.057)	(0.059)	(0.033)	(0.067)	(0.082)	(0.042)
1 for common official or primary language	2.339***	2.396***	-0.057	1.375***	1.617***	-0.241***	1.721***	1.500***	0.221***	2.331***	2.492***	-0.161**
	(0.366)	(0.454)	(0.101)	(0.166)	(0.199)	(0.047)	(0.122)	(0.125)	(0.071)	(0.118)	(0.143)	(0.073)
1 for pairs ever in colonial relationship	2.759***	2.928***	-0.169	3.670***	4.148***	-0.478***	2.051***	2.128***	-0.077	2.118***	2.264***	-0.146
	(0.548)	(0.598)	(0.128)	(0.774)	(0.838)	(0.154)	(0.165)	(0.171)	(0.096)	(0.286)	(0.353)	(0.176)
Island	0.190	0.214	-0.023	0.247***	0.184***	0.062**	0.041	0.071	-0.031	0.098	-0.036	0.134*
	(0.123)	(0.148)	(0.046)	(0.045)	(0.063)	(0.025)	(0.107)	(0.111)	(0.062)	(0.118)	(0.142)	(0.073)
Landlocked	-0.481***	-0.639***	0.158***	0.085	-0.058	0.143***	-0.376***	-0.508***	0.132***	0.297***	0.216*	0.081
	(0.118)	(0.151)	(0.039)	(0.054)	(0.072)	(0.023)	(0.086)	(0.088)	(0.050)	(0.099)	(0.120)	(0.062)
Official lang. English	0.098	-0.233	0.331***	0.131**	-0.329***	0.461***	0.041	-0.269***	0.310***	-0.317***	-0.719***	0.402***
	(0.187)	(0.224)	(0.051)	(0.059)	(0.076)	(0.023)	(0.087)	(0.089)	(0.050)	(0.094)	(0.114)	(0.058)
Official lang. French	-0.127	-1.017***	0.890***	0.467***	-0.394***	0.862***	0.159	-0.657***	0.816***	0.168	-0.763***	0.932***
	(0.163)	(0.202)	(0.047)	(0.069)	(0.089)	(0.026)	(0.097)	(0.100)	(0.056)	(0.109)	(0.132)	(0.068)
Official lang. Spanish	0.069	0.165	-0.096	0.468***	0.319**	0.149***	0.106	0.156	-0.050	-0.189	-0.551***	0.362***
	(0.248)	(0.315)	(0.083)	(0.125)	(0.155)	(0.046)	(0.102)	(0.105)	(0.059)	(0.116)	(0.140)	(0.072)
Years of war 1950-2000 (log)	0.147***	0.173***	-0.026	0.004	-0.001	0.005	0.154***	0.164***	-0.010	-0.010	-0.031	0.021
	(0.041)	(0.054)	(0.017)	(0.016)	(0.022)	(0.008)	(0.033)	(0.034)	(0.019)	(0.036)	(0.044)	(0.022)
Religious fractionalisation	0.769***	0.072	0.698***	0.738***	0.151	0.587***	1.058***	0.216	0.841***	1.390***	0.739***	0.650***
	(0.173)	(0.226)	(0.074)	(0.071)	(0.094)	(0.032)	(0.148)	(0.153)	(0.086)	(0.165)	(0.200)	(0.102)
Restrictions to women mobility	0.058	-0.392**	0.450***	0.165*	-0.244**	0.409***	0.087	-0.375***	0.462***	-0.057	-0.294*	0.237***
	(0.112)	(0.143)	(0.044)	(0.085)	(0.107)	(0.033)	(0.115)	(0.119)	(0.067)	(0.127)	(0.154)	(0.079)
Constant	-15.738*	-21.649**	5.911***	2.983*	-4.456**	7.439***	-34.100***	-40.451***	6.350***	-10.582***	-14.848***	4.267***
	(8.349)	(9.469)	(1.658)	(1.684)	(2.196)	(0.671)	(1.117)	(1.153)	(0.649)	(1.247)	(1.508)	(0.771)
Origin dummies	No	No	No	No	No	No	No	No	No	No	No	No
Destination dummies	No	No	No	No	No	No	No	No	No	No	No	No
Method	OLS	OLS	OLS	OLS	OLS	OLS	Heckman	Heckman	Heckman	Heckman	Heckman	Heckman
Mills							0.226	0.535***	-0.309***	0.782***	1.209***	-0.427***
							(0.178)	(0.181)	(0.102)	(0.161)	(0.194)	(0.100)
Observations	3458	3458	3458	8184	8184	8184	3458	3458	3458	8184	8184	8184
Adjusted R-squared	0.42	0.41	0.52	0.56	0.52	0.53						

Note: Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Tukey and Mexico are included in the non-OECD category.

For the Heckman model, the excluded instruments in the second-stage regressions are a dummy for diplomatic representation of country i in country j (or the contrary) and the share of foreign-born with unidentified origin country in the destination country. Both variables are siginificant at 1% in the first-stage probit estimations.

Source: DIOC-E 2000 (release 2.0)

Table 10: Bilateral OLS and Heckman regressions of the determinants on emigration rates for the highly skilled, total emigration rates, and the selection ratio (with origin and destination dummies), population aged 15 and over, circa 2000

	Non OECD → OECD countries			Non OECD → Non OECD countries			Non OECD → OECD countries			Non OECD → Non OECD countries		
	Highly skilled emigration rate	Total emigration rate	Selection	Highly skilled emigration rate	Total emigration rate	Selection	Highly skilled emigration rate	Total emigration rate	Selection	Highly skilled emigration rate	Total emigration rate	Selection
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Difference Destination-Origin GDP per cap. 1985-2000	0.141	0.008	0.133**	-0.364***	-0.496***	0.132***	-0.382***	-0.342**	-0.040	0.194	0.051	0.143
	(0.134)	(0.170)	(0.053)	(0.070)	(0.096)	(0.031)	(0.140)	(0.157)	(0.063)	(0.295)	(0.349)	(0.160)
Distance (log)	-1.233***	-1.531***	0.298***	-1.250***	-1.706***	0.456***	-1.195***	-1.379***	0.184***	-1.495***	-1.852***	0.357***
	(0.088)	(0.106)	(0.028)	(0.034)	(0.046)	(0.018)	(0.057)	(0.063)	(0.025)	(0.046)	(0.054)	(0.024)
1 for common official of primary language	1.273***	1.355***	-0.082**	1.144***	1.299***	-0.155***	1.202***	1.056***	0.146***	1.704***	1.344***	0.360***
	(0.114)	(0.135)	(0.037)	(0.067)	(0.087)	(0.030)	(0.092)	(0.102)	(0.041)	(0.101)	(0.119)	(0.054)
1 for pairs ever in colonial relationship	2.526***	2.767***	-0.240***	3.328***	3.593***	-0.266*	2.282***	2.376***	-0.094	2.189***	2.378***	-0.189
	(0.208)	(0.239)	(0.055)	(0.402)	(0.457)	(0.147)	(0.139)	(0.153)	(0.061)	(0.231)	(0.269)	(0.121)
Constant	1.224	2.410**	-1.186***	1.482***	4.272***	-2.790***	4.275***	5.329***	-1.055***	2.962***	5.295***	-2.333***
	(0.869)	(1.055)	(0.287)	(0.347)	(0.471)	(0.178)	(0.632)	(0.706)	(0.281)	(0.680)	(0.801)	(0.366)
Origin dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Destination dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Method	OLS	OLS	OLS	OLS	OLS	OLS	Heckman	Heckman	Heckman	Heckman	Heckman	Heckman
Mills							0.690***	0.526***	0.163***	0.656***	0.551***	0.105***
							(0.115)	(0.130)	(0.0521)	(0.0907)	(0.107)	(0.0491)
Observations	3458	3458	3458	8184	8184	8184	3458	3458	3458	8184	8184	8184
Adjusted R-squared	0.71	0.67	0.83	0.69	0.61	0.81						

Note: Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Tukey and Mexico are included in the non-OECD category

For the Heckman model, the excluded instruments in the second-stage regressions are a dummy for diplomatic representation of country i in country j (or the contrary) and the share of foreign-born with unidentified origin country in the destination country. Both variables are siginificant at 1% in the first-stage probit estimations.

Source: DIOC-E 2000 (release 2.0)

71. One of the striking results presented in the descriptive analysis of the DIOC-E in previous sections relates to the fact that African countries, and to a lesser extent Latin American countries, face a relatively high emigration rate of the highly skilled. To what extent could this result be explained by structural factors specific to these regions? To address this question, regional dummies for countries of origin were introduced in the OLS and Heckman regressions from non-OECD origin to OECD destination countries. In order to control for possible destination effects, regional dummies for destination countries were also added. Furthermore, to capture the non-linear relationship between emigration rates and the GDP of the origin country, GDP variables in quintiles were included.

72. An inverted U relationship between total emigration rates and the GDP per capita of the origin country appears (see Model 4 to 6 in Table 11), which is consistent with previous findings (see Chart 8a). Total emigration rate is significantly lower only for the poorest countries of origin. The relationship with the selection ratio on the other hand is clearly linear and negative, and the selection of migrants decreases gradually from low to high income origin countries.

73. Regional dummies for countries of destination show that European countries attract significantly fewer immigrants from non-OECD countries than other OECD destination countries. Furthermore, the emigration rate of the highly skilled to European OECD countries is also lower and the immigrants are less selected compared to other destinations, notably OECD settlement countries (Australia, Canada, and New Zealand). These results are due to differences in migration policies as well as historical migration patterns in destination countries.

74. Everything being equal, a specific effect associated with African and Latin American origins seems to persist. This is not the case however for Asian migration. Overall, emigration rates for the highly skilled are higher in African countries and migration is more selected compared to all other regions of origin. This result is puzzling as the estimated models already include a wide range of explanatory variables. Therefore, at this stage, interpretation should be made with caution.

75. The persistence of regional effects could be due to historical migration patterns which are imperfectly depicted by other factors controlled for in the model (i.e. colonial status, official language, distance to the destination country, etc.). If the education data for African and Latin American countries of origin were systematically underestimating the number of tertiary educated that could also lead to the results mentioned above. This is, however, unlikely, notably for Latin American countries where only census data are used.

76. In any case, the remaining regional effects, after having controlled for the main determinants of emigration rates of highly skilled and of the selection ratios between non-OECD origin and OECD destination countries, are puzzling and need further investigation, either to resolve remaining limitations and rule out the possibility of a statistical artefact, or to reach a thorough explanation for this result.

Table 11: Bilateral OLS and Heckman regressions of the determinants on emigration rates for the highly skilled, total emigration rates, and the selection ratio (without origin and destination dummies), population aged 15 and over, circa 2000

	Non OECD → OECD countries			Non OECD → OECD countries		
	Highly skilled emigration rate	Total emigration rate	Selection	Highly skilled emigration rate	Total emigration rate	Selection
	(1)	(2)	(3)	(4)	(5)	(6)
GDP per cap. 1985-2000 (log) – Destination	1.107**	1.318*	-0.211	2.339***	2.694***	-0.354***
	(0.531)	(0.660)	(0.160)	(0.086)	(0.089)	(0.049)
Population 1985-2000 (log) – Origin	-0.205***	-0.159**	-0.046**	-0.203***	-0.202***	-0.001
	(0.057)	(0.064)	(0.020)	(0.036)	(0.037)	(0.020)
Population 1985-2000 (log) – Destination	-0.132	-0.211	0.078	0.738***	0.753***	-0.015
	(0.315)	(0.372)	(0.071)	(0.039)	(0.041)	(0.022)
Area (log) – Origin	-0.106***	-0.057	-0.049***	-0.129***	-0.106***	-0.023
	(0.030)	(0.039)	(0.011)	(0.026)	(0.027)	(0.015)
Area (log) – Destination	0.675***	0.799***	-0.123***	0.181***	0.252***	-0.071***
	(0.240)	(0.272)	(0.043)	(0.035)	(0.036)	(0.020)
Distance (log)	-0.813***	-1.321***	0.508***	-0.749***	-1.160***	0.411***
	(0.148)	(0.182)	(0.076)	(0.061)	(0.063)	(0.035)
1 for common official or primary language	2.289***	2.400***	-0.111	1.522***	1.352***	0.169**
	(0.347)	(0.418)	(0.084)	(0.125)	(0.129)	(0.071)
1 for pairs ever in colonial relationship	2.980***	3.126***	-0.146	2.289***	2.286***	0.004
	(0.493)	(0.576)	(0.140)	(0.166)	(0.173)	(0.095)
Island	0.231**	0.017	0.214***	0.166	-0.001	0.166***
	(0.095)	(0.115)	(0.052)	(0.113)	(0.117)	(0.064)
Landlocked	-0.372***	-0.642***	0.269***	-0.229***	-0.485***	0.255***
	(0.105)	(0.138)	(0.042)	(0.086)	(0.089)	(0.049)
Official lang. English	-0.215	-0.133	-0.082*	-0.211**	-0.092	-0.120**
	(0.129)	(0.146)	(0.044)	(0.101)	(0.105)	(0.057)
Official lang. French	-0.563***	-0.740***	0.176***	-0.299**	-0.427***	0.128*
	(0.123)	(0.138)	(0.032)	(0.126)	(0.131)	(0.072)
Official lang. Spanish	-0.704***	-0.078	-0.627***	-0.465***	0.083	-0.548***
	(0.150)	(0.217)	(0.091)	(0.178)	(0.184)	(0.101)
Years of war 1950-2000 (log)	0.224***	0.202***	0.022	0.224***	0.187***	0.037**
	(0.043)	(0.061)	(0.021)	(0.033)	(0.034)	(0.019)
Religious fractionalisation	0.495**	0.190	0.305***	0.795***	0.345**	0.450***
	(0.184)	(0.251)	(0.095)	(0.154)	(0.160)	(0.088)
Restrictions to women mobility	0.075	-0.100	0.176***	0.083	-0.115	0.198***
	(0.122)	(0.147)	(0.053)	(0.120)	(0.124)	(0.068)
Destination: Europe	0.608	0.793	-0.184	-1.049***	-0.824***	-0.225***
	(0.799)	(0.919)	(0.157)	(0.150)	(0.154)	(0.085)
Destination: USA	2.919***	3.064***	-0.145	-0.301	-0.484**	0.183*
	(0.859)	(0.979)	(0.197)	(0.190)	(0.197)	(0.108)
Origin: Africa	0.687***	-0.291	0.977***	0.774***	-0.184	0.959***
	(0.215)	(0.307)	(0.116)	(0.145)	(0.150)	(0.082)
Origin: Asia	-0.216	-0.256	0.040	-0.145	-0.193	0.048
	(0.181)	(0.242)	(0.134)	(0.122)	(0.126)	(0.069)
Origin: Latin America and Caribbean	0.557**	-0.117	0.674***	0.606***	-0.012	0.618***
	(0.237)	(0.293)	(0.100)	(0.173)	(0.179)	(0.098)
Second quintile GDP per cap at origin	0.184**	0.776***	-0.593***	0.117	0.651***	-0.534***
	(0.081)	(0.094)	(0.026)	(0.106)	(0.109)	(0.060)
Third quintile GDP per cap at origin	-0.049	0.992***	-1.041***	-0.194*	0.762***	-0.956***
	(0.125)	(0.141)	(0.035)	(0.113)	(0.117)	(0.064)
Fourth quintile GDP per cap at origin	0.044	1.245***	-1.201***	-0.081	1.005***	-1.086***
	(0.123)	(0.145)	(0.046)	(0.117)	(0.121)	(0.066)
Fifth quintile GDP per cap at origin	-0.715***	0.852***	-1.568***	-0.622***	0.781***	-1.404***
	(0.166)	(0.205)	(0.064)	(0.127)	(0.131)	(0.072)
Constant	-15.314*	-17.111	1.797	-33.927***	-37.451***	3.524***
	(8.902)	(10.846)	(2.378)	(1.240)	(1.285)	(0.705)
Origin dummies	No	No	No	No	No	No
Destination dummies	No	No	No	No	No	No
Method	OLS	OLS	OLS	Heckman	Heckman	Heckman
Mills				0.306*	0.578***	-0.272***
				(0.169)	(0.173)	(0.096)
Observations	3458	3458	3458	3458	3458	3458
Adjusted R-squared	0.456	0.436	0.555			

Note: Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1
Turkey and Mexico are included in the non-OECD category.

For the Heckman model, the excluded instruments in the second-stage regressions are a dummy for diplomatic representation of country i in country j (or the contrary) and the share of foreign-born with unidentified origin country in the destination country. Both variables are siginificant at 1% in the first-stage probit estimations.

The reference category for the origin regional dummies comprises European and Oceanian countries; the reference category for the destination regional dummies comprises Japan, Canada, Australia and New Zealand and the reference category for the origin country income groups is the first quintile.

Source: DIOC-E 2000 (release 2.0)

Conclusion

77. Collecting more accurate and internationally comparable data is a first, albeit crucial, step towards better understanding of the nature and the scope of migration movements and towards evidence-based policy making. DIOC-E (release 2.0) makes a major contribution by supplying new multidimensional information on bilateral migration for 89 countries of destination and more than 230 countries of origin. DIOC-E also improves, both quantitatively and qualitatively, available estimates on emigration rates for the highly skilled, allowing for a reappraisal of the so-called “brain drain” issue. The extension of the Database on Immigrants in OECD Countries to non-OECD countries opens up a wide range of new possibilities to investigate international migration patterns not only with regard to South-North migration, but also with regard to South-South migration.

78. This paper gave a short overview of the potential of DIOC-E to shed light on characteristics of immigrants in different receiving countries, characteristics of emigrants by sending countries, regional aspects of international migration, new emigration rates by skill level and the factors determining these figures on a unilateral and bilateral dimension. According to DIOC-E (release 2.0) almost 35 million migrants aged 15 and over live outside the OECD, out of a total of 110 million. On average the total emigration rate reaches 2.4%. The Database reveals important variations between regions and countries of birth. In general, the emigration rate for highly skilled persons is higher than the total emigration rate in all regions, which reflects the selective nature of migration. Econometric analysis reveals that the impact of both the origin country's and destination country's income is more pronounced in the case of migration towards OECD countries. It also appears that distance more strongly affects migration between "South-South" pairs of countries and that even after controlling for origin and destination specificities, dyad-specific variables, such as a common language or a past colonial relationship, retain a strong explanatory power.

79. An update of DIOC for 2005/06 and a further extension of DIOC-E, especially to extend the coverage to more African and Western Asian countries, are underway. The 2010 round of the population census however offers a unique opportunity to update this information and to implement a continuous monitoring of the impact of international migration, both highly skilled and low-skilled, on countries of origin.

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Table A.1: Emigration rates by country of origin, population 15 and over, circa 2000

				Emigration rates in %							
				Total				Women			
				Version 1		Version 2		Version 1		Version 2	
Country of origin		Emigrant population (in thousands)	Tertiary-educated (%)	Total	Tertiary-educated	Total	Tertiary-educated	Total	Tertiary-educated	Total	Tertiary-educated
ABW	Aruba	6.7	41.7	8.81	..	..	..	9.30	..	..	..
AFG	Afghanistan[BL]	168.2	19.6	1.51	4.15	..	..	1.25	8.21	..	..
AGO	Angola	222.5	18.9	2.92	..	..	..	2.91	..	..	..
AIA	Anguilla	1.8	34.0	13.78	..	..	..	13.79	..	..	..
ALB	Albania[BL]	528.0	9.0	20.01	26.82	..	..	16.91	29.16	..	..
AND	Andorra	4.2	26.0	5.96	..	..	..	6.83	..	..	..
ANT	Netherlands Antilles	15.2	28.3	10.06	..	..	..	9.78	..	..	..
ARE	United Arab Emirates[BL]	27.7	16.5	1.11	1.28	..	..	1.67	2.27	..	..
ARG	Argentina	517.9	30.4	1.91	6.29	2.02	6.55	1.89	5.20	2.01	5.39
ASM	American Samoa	31.0	10.8	35.10	..	..	..	26.18	..	..	..
ATG	Antigua and Barbuda	28.5	24.1	28.24	..	..	..	29.31	..	..	..
AUS	Australia	316.8	43.3	2.04	3.86	2.79	5.66	2.18	3.71	2.97	5.29
AUT	Austria	414.5	28.3	5.78	13.21	6.64	15.09	6.14	14.15	7.06	16.43
BDI	Burundi[BL]	132.1	4.9	3.67	29.07	..	..	3.43	31.08	..	..
BEL	Belgium	368.4	32.0	4.20	5.55	4.74	6.25	4.59	5.46	5.19	6.09
BEN	Benin	20.4	37.2	0.52	24.35	0.55	27.16	0.45	33.23	0.47	37.57
BFA	Burkina Faso	34.4	9.8	0.55	3.17	0.58	4.03	0.48	3.48	0.51	4.26
BGD	Bangladesh[BL]	3854.5	3.9	4.22	4.51	..	..	4.03	2.67	..	..
BGR	Bulgaria	659.8	14.4	8.91	7.88	8.94	7.94	9.13	7.09	9.17	7.15
BHR	Bahrain[BL]	80.9	15.6	14.73	21.70	..	..	17.93	26.52	..	..
BHS	Bahamas[L]	30.3	29.5	12.41	19.60	..	..	13.24	20.20	..	..
BLZ	Belize	44.4	20.0	23.21	59.46	27.75	66.20	26.06	63.36	30.80	68.81
BMU	Bermuda	19.4	35.2	23.49	..	..	..	..	..	..	..
BOL	Bolivia	332.4	11.6	6.21	8.59	6.28	8.95	6.10	8.31	6.17	8.66
BRA	Brazil	702.4	23.3	0.57	2.60	0.57	2.66	0.60	2.77	0.60	2.80
BRB	Barbados[BL]	90.1	27.0	28.45	90.42	..	..	29.21	90.92	..	..
BRN	Brunei Darussalam[BL]	13.8	32.5	5.69	19.69	..	..	5.77	19.71	..	..
BTN	Bhutan	10.1	8.6	2.93	..	..	..	2.91	..	..	..
BWA	Botswana[BL]	20.9	11.2	1.92	6.01	..	..	1.42	6.66	..	..
CAF	Central African Republic[BL]	10.5	32.4	0.47	8.93	..	..	0.46	12.48	..	..
CAN	Canada	1089.6	40.1	4.20	5.00	5.35	6.63	4.56	4.74	5.82	6.13
CCK	Cocos (Keeling) Islands	0.0	35.7	..	..	..	..	..	..	..	..
CHE	Switzerland	443.7	25.0	6.90	8.69	9.00	12.12	7.23	13.29	9.47	20.82
CHL	Chile	471.0	19.7	4.06	9.66	4.12	9.99	4.08	10.09	4.13	10.41
CHN	China[BL]	2513.0	36.3	0.26	1.96	..	..	0.28	2.49	..	..
CIV	Côte d'Ivoire[BL]	402.1	8.7	3.98	16.90	..	..	4.29	18.69	..	..
CMR	Cameroon[BL]	62.6	42.5	0.69	15.71	..	..	0.68	22.57	..	..
COD	Congo, Dem. Rep. of[BL]	284.1	15.8	1.05	12.58	..	..	1.03	21.48	..	..
COG	Congo[BL]	79.6	33.9	4.11	38.25	..	..	3.76	43.61	..	..
COK	Cook Islands	17.8	8.2	49.74	..	..	..	51.52	..	..	..
COL	Colombia	1367.2	16.1	4.63	6.29	4.65	6.34	4.90	6.20	4.91	6.24
COM	Comoros[L]	18.2	10.6	4.36	15.38	..	..	4.21	23.18	..	..
CPV	Cape Verde	90.8	6.3	26.07	..	..	..	25.30	..	..	..
CRI	Costa Rica	88.6	24.7	3.20	8.54	3.52	9.47	3.47	8.98	3.81	9.82
CSFR	Former Czecheslovakia	147.9	30.3	..	..	..	..	..	..	..	..
CSFR-CZE	Czech Republic	275.2	24.6	3.12	7.04	3.29	7.49	3.51	7.79	3.70	8.27
CSFR-SVK	Slovakia	364.4	13.1	7.75	9.42	7.97	9.80	8.22	9.35	8.46	9.70
CUB	Cuba	976.0	24.9	9.93	24.82	9.94	24.91	10.09	23.94	10.11	24.04
CYM	Cayman Islands	2.4	18.2	5.73	..	..	..	6.86	..	..	..
CYP	Cyprus[BL]	144.9	25.0	19.22	19.78	..	..	18.92	17.45	..	..
DEU	Germany	3401.1	28.8	4.67	6.82	5.30	7.52	5.09	8.97	5.74	10.02
DJI	Djibouti	5.6	30.2	1.28	..	..	..	1.23	..	..	..
DMA	Dominica	25.9	22.5	11.97	..	..	..	28.47	..	..	..
DNK	Denmark	167.1	36.1	3.70	5.97	3.98	6.51	3.81	5.86	4.10	6.34
DOM	Dominican Republic	776.5	12.1	11.97	17.40	12.13	17.82	13.41	18.25	13.54	18.58
DZA	Algeria[BL]	1330.2	16.5	6.20	14.82	..	..	5.95	15.67	..	..
ECU	Ecuador	559.4	15.3	6.48	11.82	6.55	12.22	6.50	13.00	6.56	13.37

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"BL" underlying education figures in the country of origin base on Barro and Lee (2010);
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Source : DIOC-E 2000 release 2.0, Barro and Lee (2010) and Lutz et al. (2010)

Table A.1: Emigration rates by country of origin, population 15 and over, circa 2000 *(cont.)*

Country of origin		Emigrant population (in thousands)	Tertiary-educated (%)	Emigration rates in %							
				Total				Women			
				Version 1		Version 2		Version 1		Version 2	
				Total	Tertiary-educated	Total	Tertiary-educated	Total	Tertiary-educated	Total	Tertiary-educated
EGY	Egypt[BL]	348.8	45.8	0.81	5.06	..	..	0.67	5.88	..	..
ERI	Eritrea[L]	48.4	21.6	2.34	12.00	..	..	2.35	21.38	..	..
ESH	Western Sahara	0.3	29.4	0.14	..	..	..	0.17	..	..	..
ESP	Spain	1074.4	17.2	3.04	2.80	3.21	2.98	3.16	2.75	3.33	2.94
ETH	Ethiopia	181.5	21.9	0.48	10.44	..	..	0.47	15.74	..	..
FIN	Finland	262.5	24.7	5.83	5.95	5.98	6.08	6.67	7.32	6.83	7.47
FJI	Fiji[BL]	119.5	22.7	18.43	32.93	..	..	19.40	34.76	..	..
FLK	Falkland Islands	2.0	33.9	..	..	..	..	..	..	..	..
FRA	France	1204.7	34.4	2.37	4.46	2.67	5.06	2.55	4.66	2.86	5.22
FSM	Micronesia	12.8	13.8	16.70	..	..	..	17.28	..	..	..
FYUG	Former Yugoslavia	114.8	15.2	..	..	..	..	..	..	..	..
FYUG-BIH	Bosnia and Herzegovina	1431.7	11.2	31.61	..	..	..	31.50	..	..	..
FYUG-HRV	Croatia	870.1	13.2	18.88	20.12	21.54	23.08	19.21	18.72	21.96	21.19
FYUG-MKD	Macedonia[L]	259.9	12.2	14.24	15.48	..	..	13.86	15.46	..	..
FYUG-SVN	Slovenia	101.6	13.0	5.74	5.68	6.33	6.18	6.21	5.43	6.77	5.78
FYUG-YUG	Serbia and Montenegro	1161.1	12.1	11.85	11.94	13.32	13.97	11.50	11.63	13.07	13.45
GAB	Gabon[BL]	17.1	33.8	2.30	6.69	..	..	2.28	4.25	..	..
GBR	United Kingdom	3488.6	33.8	6.80	9.85	7.46	11.42	6.79	9.36	7.47	10.90
GHA	Ghana[BL]	213.8	26.2	1.77	33.49	..	..	1.73	49.95	..	..
GIB	Gibraltar	12.1	25.5	30.93	..	..	..	32.09	..	..	..
GIN	Guinea	54.7	10.4	1.18	7.59	1.24	8.20	0.98	12.93	1.03	14.09
GMB	Gambia	23.1	16.1	2.80	10.07	3.14	12.43	2.03	8.08	2.22	9.59
GNB	Guinea-Bissau	40.9	10.6	5.29	..	..	..	4.22	..	..	..
GNQ	Equatorial Guinea	30.0	11.6	10.79	..	..	..	9.44	..	..	..
GRC	Greece	712.6	15.7	7.11	7.56	7.90	8.51	6.66	6.12	7.39	7.08
GRD	Grenada	57.8	19.8	46.94	..	..	..	50.05	..	..	..
GTM	Guatemala	513.6	8.5	7.56	12.26	7.60	12.55	6.63	13.11	6.67	13.44
GUM	Guam	56.5	26.7	34.38	..	..	..	35.08	..	..	..
GUY	Guyana[BL]	317.6	24.5	38.43	77.79	..	..	39.31	75.36	..	..
HKG	Hong Kong, China[BL]	398.1	39.0	6.71	16.85	..	..	6.56	17.24	..	..
HND	Honduras	308.6	10.2	7.97	23.05	8.02	23.99	8.08	26.10	8.13	26.94
HTI	Haiti[BL]	523.0	18.0	9.27	70.41	..	..	9.21	66.30	..	..
HUN	Hungary	382.5	28.5	4.31	10.24	4.45	10.80	4.24	9.81	4.39	10.31
IDN	Indonesia	996.6	14.1	0.67	2.41	0.67	2.41	0.64	2.66	0.64	2.66
IND	India	2621.4	41.5	0.38	2.91	0.39	2.93	0.41	3.99	0.42	4.00
IOT	British Indian Ocean Territory	0.1	52.5	..	..	..	..	..	..	..	..
IRL	Ireland	795.0	26.3	21.06	19.56	23.06	22.92	22.50	20.40	24.58	23.67
IRN	Iran[BL]	706.2	42.6	1.62	8.59	..	..	1.47	7.92	..	..
IRQ	Iraq	412.6	26.1	2.79	12.03	2.81	12.19	2.28	11.73	2.29	11.85
ISL	Iceland[BL]	22.8	38.2	9.57	16.11	..	..	10.20	16.47	..	..
ISR	Israel	173.8	43.0	3.83	5.13	6.20	9.98	3.31	4.13	5.55	8.20
ITA	Italy	2723.7	11.9	5.22	7.07	5.43	7.50	4.77	5.73	4.98	6.13
JAM	Jamaica	791.8	24.9	31.34	46.06	31.53	47.04	33.30	46.69	33.49	47.48
JOR	Jordan	71.3	39.8	2.43	4.72	2.66	5.15	1.89	3.05	2.04	3.23
JPN	Japan	686.1	45.1	0.63	0.99	0.64	1.00	0.72	1.16	0.73	1.18
KEN	Kenya	264.8	30.3	1.49	32.98	1.52	36.03	1.53	42.99	1.56	47.34
KHM	Cambodia[BL]	239.8	15.5	3.13	43.70	..	..	3.06	55.57	..	..
KIR	Kiribati	1.9	21.5	2.21	..	..	..	2.55	..	..	..
KNA	Saint Kitts and Nevis	20.3	27.8	33.40	..	..	..	35.60	..	..	..
KOREA-NO	North Korea	17.4	26.2	0.10	..	..	..	0.09	..	..	..
KOREA-NS	North and South Korea	481.7	23.8	..	..	..	..	..	..	..	..
KOREA-SO	South Korea[BL]	985.8	43.8	2.59	3.69	..	..	2.97	4.83	..	..
KWT	Kuwait[BL]	70.1	26.3	4.08	10.94	..	..	4.99	10.46	..	..
LAO	Laos	275.4	13.7	8.51	10.76	8.54	10.78	8.44	11.93	8.46	11.95
LBN	Lebanon	378.3	30.2	12.61	..	..	..	10.98	..	..	..
LBR	Liberia[BL]	126.8	11.8	7.19	15.84	..	..	7.84	17.91	..	..
LBY	Libya[BL]	82.9	21.3	2.23	4.53	..	..	2.27	3.27	..	..
LCA	Saint Lucia	25.6	20.7	19.52	..	..	..	20.76	..	..	..

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Table A.1: Emigration rates by country of origin, population 15 and over, circa 2000 *(cont.)*

Country of origin		Emigrant population (in thousands)	Tertiary-educated (%)	Emigration rates in %							
				Total				Women			
				Version 1		Version 2		Version 1		Version 2	
				Total	Tertiary-educated	Total	Tertiary-educated	Total	Tertiary-educated	Total	Tertiary-educated
LIE	Liechtenstein	3.6	20.9	9.94	..	..	..	11.79	..	..	..
LKA	Sri Lanka	503.4	19.1	3.55	28.78	3.55	29.05	3.36	25.08	3.36	25.30
LSO	Lesotho[BL]	107.0	1.1	8.91	10.92	..	..	7.10	8.97	..	..
LUX	Luxembourg	31.7	24.8	8.20	11.67	12.35	20.83	9.03	12.84	13.46	23.67
MAC	Macao[BL]	18.6	36.1	5.16	16.70	..	..	5.40	17.85	..	..
MAR	Morocco[BL]	1679.5	14.2	8.07	14.33	..	..	7.14	16.72	..	..
MCO	Monaco	13.1	22.5	29.07	..	..	..	28.80	..	..	..
MDG	Madagascar[L]	77.9	31.6	0.86	9.68	..	..	0.96	11.16	..	..
MDV	Maldives[BL]	1.3	20.6	0.77	11.90	..	..	0.76	18.35	..	..
MEX	Mexico	8368.4	5.8	11.15	5.35	11.19	5.40	9.79	5.71	9.82	5.77
MHL	Marshall Islands	6.5	13.7	..	..	..	..	..	..	..	..
MLI	Mali	102.8	7.5	1.95	14.57	1.99	15.59	1.61	19.10	1.64	20.62
MLT	Malta[BL]	98.9	14.9	24.11	31.69	..	..	23.76	34.31	..	..
MMR	Myanmar[BL]	219.8	15.2	0.68	1.88	..	..	0.64	2.05	..	..
MNG	Mongolia	27.5	30.8	1.67	5.37	1.68	5.44	1.81	5.94	1.82	6.00
MNP	Northern Mariana Islands	3.8	26.7	5.07	..	..	..	5.35	..	..	..
MOZ	Mozambique[BL]	379.6	6.4	3.57	40.57	..	..	2.39	59.39	..	..
MRT	Mauritania[BL]	24.7	13.2	1.63	10.25	..	..	0.98	13.54	..	..
MSR	Montserrat	11.4	19.2	68.40	..	..	..	72.48	..	..	..
MUS	Mauritius	95.9	25.1	9.81	53.84	9.96	55.26	10.57	60.76	10.77	62.60
MWI	Malawi[BL]	46.0	13.6	0.73	22.50	..	..	0.46	29.08	..	..
MYS	Malaysia	517.7	30.4	3.24	9.27	3.55	9.75	3.67	9.78	3.99	10.26
NAM	Namibia[BL]	44.7	15.7	3.96	16.95	..	..	3.87	15.86	..	..
NER	Niger[BL]	62.3	5.6	1.06	6.26	..	..	0.83	10.27	..	..
NGA	Nigeria[L]	318.6	47.5	0.47	2.73	..	..	0.41	3.30	..	..
NIC	Nicaragua	431.3	11.5	12.51	23.46	12.59	23.98	12.88	22.79	12.96	23.19
NIU	Niue	5.5	11.5	75.51	..	..	..	76.43	..	..	..
NLD	Netherlands	604.5	33.9	4.45	7.32	4.99	8.19	4.42	7.03	4.96	7.91
NOR	Norway	127.5	34.6	3.43	4.57	3.73	5.10	3.73	4.38	4.05	4.91
NPL	Nepal	647.9	1.5	4.30	2.71	4.46	2.88	4.33	4.78	4.55	5.58
NRU	Nauru	0.5	23.3	4.86	..	..	..	5.27	..	..	..
NZL	New Zealand	415.8	28.9	12.25	11.72	15.27	15.03	11.87	12.56	14.80	16.06
OMN	Oman	2.8	37.8	0.18	..	..	..	0.16	..	..	..
PAK	Pakistan[BL]	1992.6	13.7	2.32	4.28	..	..	2.21	3.89	..	..
PAN	Panama	155.9	31.9	7.20	26.05	7.46	27.70	8.42	26.70	8.73	27.98
PCN	Pitcairn	0.2	46.5	..	..	..	..	..	..	..	..
PER	Peru	603.8	26.6	3.47	4.96	3.48	5.00	3.73	5.05	3.74	5.09
PHL	Philippines	2054.0	44.3	4.15	15.01	4.22	15.26	5.01	16.57	5.10	16.83
PLW	Pacific Islands (Palau)	4.3	33.3	..	..	..	..	..	..	..	..
PNG	Papua New Guinea[BL]	28.1	32.4	0.88	19.07	..	..	0.98	33.77	..	..
POL	Poland	2264.4	21.9	6.80	13.02	6.96	13.33	7.21	12.58	7.40	12.84
PRI	Puerto Rico	1304.1	14.9	30.83	30.23	33.17	33.58	30.86	29.23	33.23	32.26
PRT	Portugal	1556.7	6.7	15.38	12.21	16.31	14.10	14.53	10.66	15.40	12.31
PRY	Paraguay	354.3	4.0	9.68	7.50	10.09	8.10	11.07	7.46	11.51	7.95
PSE	Occup. Palestinian Terr.	23.9	36.0	1.40	..	..	..	1.10	..	..	..
QAT	Qatar[BL]	3.4	44.6	0.73	2.04	..	..	0.95	1.96	..	..
ROU	Romania	1144.1	24.1	5.96	12.08	6.00	12.25	6.12	12.63	6.16	12.79
RWA	Rwanda	87.1	6.7	1.99	19.52	2.10	29.76	1.84	28.90	1.92	41.41
SAU	Saudi Arabia[BL]	42.3	31.6	0.33	0.81	..	..	0.32	0.75	..	..
SDN	Sudan[BL]	196.5	13.0	1.01	7.89	..	..	0.93	5.91	..	..
SEN	Senegal	208.2	14.3	3.45	14.81	3.48	15.72	2.62	18.23	2.64	19.60
SGP	Singapore	156.4	37.4	4.74	9.12	6.03	12.10	5.16	10.92	6.75	14.22
SHN	Saint Helena	3.0	11.2	..	..	..	..	..	..	..	..
SLB	Solomon Islands	1.9	38.4	0.80	..	..	..	0.91	..	..	..
SLE	Sierra Leone[BL]	122.3	13.2	4.50	39.14	..	..	4.79	57.85	..	..
SLV	El Salvador	872.5	7.9	17.95	24.85	18.07	25.28	17.12	25.56	17.23	25.95
SMR	San Marino	2.9	12.7	9.69	..	..	..	11.55	..	..	..
SOM	Somalia	152.9	14.2	3.73	..	..	..	3.73	..	..	..

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Table A.1: Emigration rates by country of origin, population 15 and over, circa 2000 *(cont.)*

Country of origin		Emigrant population (in thousands)	Tertiary-educated (%)	Emigration rates in %							
				Total				Women			
				Version 1		Version 2		Version 1		Version 2	
				Total	Tertiary-educated	Total	Tertiary-educated	Total	Tertiary-educated	Total	Tertiary-educated
STP	São Tomé and Príncipe	12.1	11.8	13.03	..	..	..	13.67	..	..	..
SUR	Suriname	7.6	31.1	2.50	..	..	..	2.67	..	..	..
SWE	Sweden	206.1	40.0	2.77	4.38	3.22	5.13	3.09	4.19	3.61	4.87
SWZ	Swaziland[BL]	30.3	5.9	4.78	8.59	..	..	3.86	5.27	..	..
SYC	Seychelles	9.1	19.0	13.01	40.64	14.11	56.76	15.46	53.01	16.44	67.32
SYR	Syria[BL]	180.8	28.5	1.81	12.36	..	..	1.59	14.22	..	..
TCA	Turks and Caicos Islands	1.4	16.9	6.45	..	..	..	7.42	..	..	..
TCD	Chad[L]	7.6	45.9	0.17	9.18	..	..	0.13	22.04	..	..
TGO	Togo[BL]	89.7	10.4	2.90	12.50	..	..	3.49	15.67	..	..
THA	Thailand	305.4	26.3	0.65	3.50	0.66	3.54	0.84	4.04	0.85	4.06
TKL	Tokelau	1.7	13.3	52.41	..	..	..	52.25	..	..	..
TLS	Timor-Leste	12.5	13.2	2.94	..	..	..	3.02	..	..	..
TON	Tonga[BL]	41.3	10.7	40.54	51.88	..	..	40.29	55.16	..	..
TTO	Trinidad and Tobago	277.6	29.7	22.49	66.65	23.29	69.30	24.28	70.09	25.20	72.39
TUN	Tunisia[BL]	462.6	16.0	6.49	15.86	..	..	5.87	16.71	..	..
TUR	Turkey	2134.9	7.1	4.31	4.23	4.41	4.45	4.13	3.85	4.23	4.12
TUV	Tuvalu	1.0	9.6	9.07	..	..	..	9.53	..	..	..
TWN	Chinese Taipei[BL]	452.0	60.0	2.51	6.11	..	..	2.80	7.09	..	..
TZA	United Rep. of Tanzania	159.0	19.5	0.84	19.91	0.85	20.76	0.81	22.53	0.82	23.65
UGA	Uganda	336.3	11.2	2.63	28.92	2.69	30.69	2.61	37.93	2.67	40.23
URY	Uruguay	230.7	16.9	8.44	11.44	8.70	11.90	8.23	10.32	8.50	10.70
USA	United States of America	1221.5	43.2	0.54	0.83	0.64	0.96	0.55	0.86	0.64	0.99
USSR	Former USSR	114.0	43.8	..	..	..	..	..	..	..	..
USSR-ARM	Armenia	474.5	21.3	17.20	20.51	18.93	23.02	14.14	17.45	15.82	19.98
USSR-AZE	Azerbaijan	951.7	20.3	14.48	..	..	..	12.67	..	..	..
USSR-BLR	Belarus	1242.2	23.2	13.20	18.66	14.69	21.90	13.59	17.58	15.11	20.54
USSR-EST	Estonia	105.4	30.0	8.59	10.19	10.73	13.60	8.55	9.18	10.89	12.14
USSR-GEO	Georgia	758.2	24.2	17.00	17.99	17.28	18.31	15.48	16.24	15.84	16.63
USSR-KAZ	Kazakhstan[BL]	2857.2	18.2	20.89	25.05	..	..	20.86	24.59	..	..
USSR-KGZ	Kyrgyzstan	449.6	20.1	12.25	21.14	13.64	23.96	12.28	21.69	13.90	24.84
USSR-LTU	Lithuania	271.3	23.2	8.82	13.70	9.44	14.96	9.04	12.72	9.70	13.84
USSR-LVA	Latvia	179.7	31.8	8.41	16.95	10.41	22.13	8.21	15.40	10.34	19.77
USSR-MDA	Moldova[BL]	374.7	24.1	10.66	22.35	..	..	9.76	19.13	..	..
USSR-RUS	Russian Federation[BL]	3158.3	27.4	2.55	4.35	2.80	4.91	2.69	4.44	2.93	4.94
USSR-TJK	Tajikistan[BL]	370.9	19.5	9.44	25.63	..	..	8.14	32.70	..	..
USSR-TKM	Turkmenistan[L]	169.7	26.9	5.58	12.73	..	..	5.54	16.52	..	..
USSR-UKR	Ukraine[BL]	4730.8	26.2	10.51	8.46	..	..	10.24	7.38	..	..
USSR-UZB	Uzbekistan[L]	955.9	23.1	5.80	9.56	..	..	5.78	12.72	..	..
VAT	Holy See	0.2	37.2	21.61	..	..	..	31.55	..	..	..
VCT	Saint Vincent and Grenadines	43.2	20.8	35.71	..	..	..	38.54	..	..	..
VEN	Venezuela	280.7	34.7	1.71	6.28	1.84	6.76	1.83	6.10	1.97	6.47
VGB	British Virgin Islands	2.0	32.4	8.88	..	..	..	11.30	..	..	..
VIR	United States Virgin Islands	49.3	25.0	37.71	..	..	..	37.11	..	..	..
VNM	Viet Nam[BL]	1549.4	23.0	2.86	18.35	..	..	2.85	19.84	..	..
VUT	Vanuatu	1.9	28.5	1.74	..	..	..	1.85	..	..	..
WSM	Samoa	71.6	10.4	40.55	..	..	..	42.53	..	..	..
YEM	Yemen[BL]	73.4	14.4	0.77	5.88	..	..	0.69	6.37	..	..
ZAF	South Africa	362.9	47.7	1.18	17.58	1.22	19.65	1.19	18.94	1.22	20.69
ZMB	Zambia[BL]	68.7	30.7	1.19	19.70	..	..	1.25	26.00	..	..
ZWE	Zimbabwe[BL]	206.6	22.1	2.73	37.37	..	..	2.50	48.81	..	..

Notes : Version 1 includes foreign-born persons in the population of the country of residence in the calculation of emigration rates.

Version 2 excludes foreign-born persons of the population in the country of residence in the calculation of emigration rates.

"BL" underlying education figures in the country of origin base on Barro and Lee (2010);

"L" underlying education figures in the country of origin base on Lutz (2010).

Source : DIOC-E 2000 release 2.0, Barro and Lee (2010) and Lutz et al. (2010)

Table A.2: Variables included in the DIOC-E and detailed sources by country

File reference	1	2	3				
Main theme	Education, Age a and Gender	Labour force status	Occupation				
Variables included	- County of residence - Country of birth - Education - Gender - Age	- Country of residence - Country of birth - Education - Gender - Labour force status	- Country of residence - Country of birth - Education - Gender - Occupation	**Definition of variables**		**Main source of data**	**Observations**
Reference population	All 15+	All 15+	15+ employed	Foreign Born status	Education		
Argentina	Census, 2001	Census, 2001	Census, 2001	Country of birth	Mapping	REDATAM	The occupations recoded for the National Statistical Institute (INDEC) show a more industrial and skills-based organization and do not map correctly to ISCO-88. The data in File 3 is therefore provided under the national classification (10 categories).
Armenia	Census, 2001	Census, 2001	Census, 2001	Country of birth	ISCED levels	Country	
Australia	Census, 2001	Census, 2001	Census, 2001	Country of birth	ISCED levels	Country	
Austria	Census, 2001	Census, 2001	Census, 2001	Country of birth	ISCED levels	Country	
Belarus	Census, 2002	-	-	Country of birth	Mapping	Country	There is no information to identify whether the levels were completed or not.
Belgium	ESEG, 2001	ESEG, 2001	LFS, 1998-2002	Country of birth	ISCED levels	Country	
Belize	Census, 2000	Census, 2000	-	Country of birth	Mapping	REDATAM	
Benin	Census, 2002	Census, 2002	-	Country of birth	ISCED levels	Country	
Bolivia	Census, 2001	Census, 2001	Census, 2001	Country of birth	Mapping	IPUMS	
Brazil	Census, 2000	Census, 2000	Census, 2000	Country of birth	Mapping	IPUMS	
Bulgaria	Census, 2001	Census, 2001	-	Nationality	ISCED levels	Country	
Burkina Faso	Census, 2006	Census, 2006	-	Country of birth	ISCED levels	Country	
Canada	Census, 2001	Census, 2001	Census, 2001	Country of birth	ISCED levels	Country	
Chile	Census, 2002	Census, 2002	Census, 2002	Country of birth	Mapping	REDATAM	
Colombia	Census, 2005	Census, 2005	-	Country of birth	Mapping	REDATAM	
Costa Rica	Census, 2000	Census, 2000	Census, 2000	Country of birth	Mapping	REDATAM	
Croatia	Census, 2001	Census, 2001	Census, 2001	Country of birth	ISCED levels	Country	
Cuba	Census, 2002	Census, 2002	Census, 2002	Country of birth	Mapping	IPUMS	There is no information to identify whether the levels were completed or not.
Czech Republic	Census, 2001	Census, 2001	Census, 2001	Country of birth	ISCED levels	Country	
Denmark	Register, 2002	Register, 2002	Register, 2002	Country of birth	ISCED levels	Country	
Dominican Republic	Census, 2002	Census, 2002	Census, 2002	Country of birth	Mapping	REDATAM	
Ecuador	Census, 2001	Census, 2001	Census, 2001	Country of birth	Mapping	Public data-INEC	
El Salvador	Census, 2007	Census, 2007	Census, 2007	Country of birth	Mapping	REDATAM	
Estonia	Census, 2000	Census, 2000	Census, 2000	Country of birth	ISCED levels	Country	
Finland	Register, 12/2000	Register, 12/2000	Register, 12/2000	Country of birth	ISCED levels	Country	
France	Census, 1999	Census, 1999	Census, 1999	Country of birth	ISCED levels	Country	Data for France only refer to metropolitan France.
Gambia	Census, 2003	-	-	Nationality	ISCED levels	Country	
Georgia	Census, 2002	-	-	Country of birth	ISCED levels	Country	
Germany	LFS, 1998-2002, 2005	LFS, 1998-2002, 2005	LFS, 1998-2002, 2005	Nationality	ISCED levels	Country	
Greece	Census, 2001	Census, 2001	Census, 2001	Country of birth	ISCED levels	Country	
Guatemala	Census, 2002	Census, 2002	Census, 2002	Country of birth	Mapping	Country	
Guinea	Census, 1996	Census, 1996	Census, 1996	Country of birth	Mapping	IPUMS	
Honduras	Census, 2001	Census, 2001	Census, 2001	Country of birth	Mapping	REDATAM	
Hungary	Census, 2001	Census, 2001	Census, 2001	Country of birth	ISCED levels	Country	
India	NSS/Census, 2000	-	-	Country of birth	ISCED levels	WorldBank	The age groups are 15-25 and 25+.
Indonesia	Census, 2000	Census, 2000	-	Nationality	Mapping	Country	Nationality is only identified for 12 countries. The share of foreigners for whom the country of nationality is unknown is around 63%. There is no information to identify whether the levels were completed or not.
Iraq	Census, 1997	Census, 1997	Census, 1997	Country of birth	Mapping	IPUMS	There is no information to identify whether the levels were completed or not.
Ireland	Census, 2002	Census, 2002	Census, 2002	Country of birth	ISCED levels	Country	
Israel	LFS, 2001	LFS, 2001	LFS, 2001	Country of birth	Mapping	Country	
Italy	Census, 2001	Census, 2001	Census, 2001	Country of birth	ISCED levels	Country	

Note: ESEG: Enquête socio-économique générale; ESPA: Enquête suisse sur la population active; LFS: Labour force survey; IPUMS: Integrated Public Use Microdata Series; REDATAM: Retrieval of DaTa for small Areas by Microcomputer

Table A.2: Variables included in the DIOC-E and detailed sources by country *(cont.)*

File reference	1	2	3	Definition of variables		Main source of data	Observations
Main theme	Education, Age a and Gender	Labour force status	Occupation				
Variables included	- County of residence - Country of birth - Education - Gender - Age	- Country of residence - Country of birth - Education - Gender - Labour force status	- Country of residence - Country of birth - Education - Gender - Occupation				
Reference population	All 15+	All 15+	15+ employed	Foreign Born status	Education		
Jamaica	Census, 2001	-	-	Country of birh	ISCED levels	Country	
Japan	Census, 2000	Census, 2000	Census, 2000	Nationality	ISCED levels	Country	The available Japan Standard Classification of Occupations (JSOC) is too different from ISCO-88 and not detailed enough to allow the construction of a satisfying correspondence table betw een the tw o. In particular, the ISCO-88 major groups 2 (Professionals) and 3 (Technicians and associate professionals) cannot be identified in the Japanese classification, w here they belong to a single category "Professional and technical w orkers". The Japanese classification w as therefore kept as is in the database (File 3).
Jordan	Census, 2004	Census, 2004	Census, 2004	Nationality	Mapping	IPUMS	The variable nationality is only coded at a regional level (i.e. Jordan, Arab Asian countries, non-Arab Asian countries, w estern European countries, eastern European countries, American countries). Therefore, the maximum level of detail is continents of birth. The percentage of foreign-born for w hom the country of birth remains unknow n is high (46%).
Kenya	Census,1999	Census,1999	-	Country of birth	Mapping	IPUMS	The variable country of birth w as only surveyed for selected African countries: Ethiopia, Somalia, Sudan, Tanzania, Uganda and "Other
Kyrgyz Republic	Census,1999	Census,1999	Census,1999	Country of birth	Mapping	IPUMS	The age groups are 16-24, 25-64 and 65+. Persons aged 15 are therefore missing for these three countries. Since individuals betw een 15 and 16 are not included in the original database, in File 2 their labour status is coded as "unknow n" (99).
Laos	Census, 1995	Census, 1995	Census, 1995	Country of birth	ISCED levels	Country	
Latvia	Census, 2001	Census, 2001	Census, 2001	Country of birth	ISCED levels	Country	
Lithuania	Census, 2001	Census, 2001	Census, 2001	Nationality	ISCED levels	Country	
Luxembourg	Census, 2001	Census, 2001	Census, 2001	Country of birth	ISCED levels	Country	
Malaysia	Census, 2000	Census, 2000	Census, 2000	Country of birth	Mapping	IPUMS	The share of foreign-born for w hom the country of birth is unknow n is around 24%. There is no information to identify w hether the levels w ere completed or not.
Mali	Census, 1998	Census, 1998	-	Country of birth	ISCED levels	Country	
Mauritius	Census, 2000	Census, 2000	Census, 2000	Country of birth	ISCED levels	Country	
Mexico	Census, 2000	Census, 2000	Census, 2000	Country of birth	ISCED levels	Country	
Mongolia	Census, 2000	Census, 2000	Census, 2000	Country of birth	Mapping	IPUMS	Only five countries of birth are identified in the census. The share of foreign-born for w hom the country of birth is unknow n is around 21%. For secondary and tertiary education it is not possible to identify w hether people completed the levels or not.
Nepal	Census, 2001	Census, 2001	Census, 2001	Country of birth	Mapping	IPUMS	
Netherlands	LFS, 1998-2002	LFS, 1998-2002	LFS, 1998-2002	Country of birth	ISCED levels	Country	
New Zealand	Census, 2001	Census, 2001	Census, 2001	Country of birth	ISCED levels	Country	
Nicaragua	Census, 2005	Census, 2005	Census, 2005	Country of birth	Mapping	REDATAM	
Norway	Registers, 12/2003	Registers, 12/2003	LFS, 1998-2002	Country of birth	ISCED levels	Country	Illiterate people or people w ith no education are not recorded in the ISCED 0 category, but classified as education "unknow n".
Panama	Census, 2000	Census, 2000	Census, 2000	Country of birth	Mapping	REDATAM	
Paraguay	Census, 2002	Census, 2002	Census, 2002	Country of birth	Mapping	REDATAM	
Peru	Census, 2007	Census, 2007	Census, 2007	Country of birth	Mapping	Public data-INE	There is no information to identify w hether the levels w ere completed or not. The share of persons w ith tertiary education is particularly high (18%) to comparable countries. This may be due to the inclusion of post-secondary non-tertiary programs in this category, but as no information on the number of years is available this issue could not be solved.
Philippines	Census, 2000	-	-	Country of birth	Mapping	IPUMS	The share of foreign-born for w hom the country of birth is unknow n is around 50%.
Poland	Census, 2001	Census, 2001	Census, 2001	Country of birth	ISCED levels	Country	
Portugal	Census, 2001	Census, 2001	Census, 2001	Country of birth	ISCED levels	Country	
Puerto Rico	Census, 2000	Census,2000	Census,2000	Country of birth	Mapping	IPUMS	
Romania	Census, 2002	Census,2002	Census,2002	Country of birth	Mapping	IPUMS	There is no information to identify w hether the levels w ere completed or not.
Russia	Census, 2002	Census, 2002	Census, 2002	Country of birth	ISCED levels	Country	
Rwanda	Census, 2002	Census, 2002	Census, 2002	Country of birth	Mapping	IPUMS	
Senegal	Census, 2002	Census, 2002	Census, 2002	Nationality	ISCED levels	Country	
Serbia	Census, 2001	Census, 2001	Census, 2001	Nationality	ISCED levels	Country	

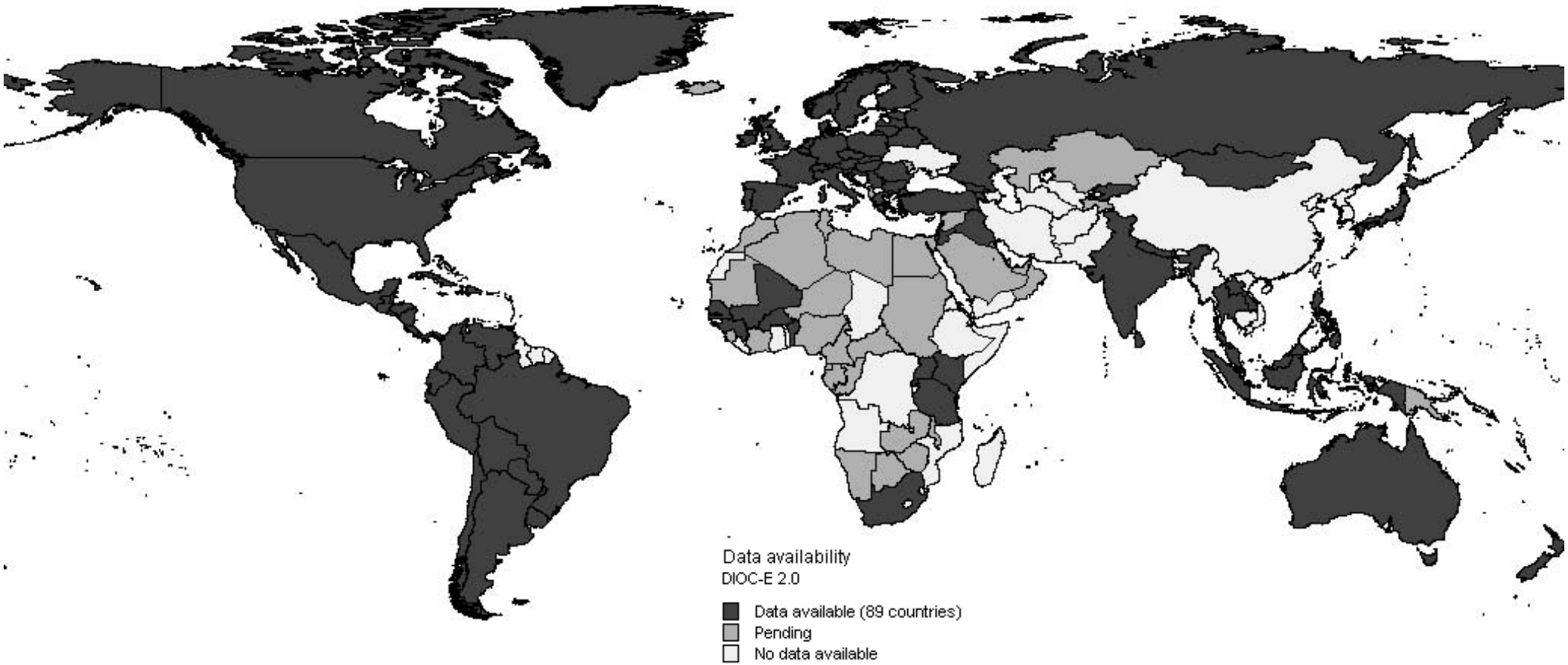
Note: ESEG: Enquête socio-économique générale; ESPA: Enquête suisse sur la population active; LFS: Labour force survey; IPUMS: Integrated Public Use Microdata Series; REDATAM: Retrieval of DaTa for small Areas by Microcomputer

Table A.2: Variables included in the DIOC-E and detailed sources by country *(cont.)*

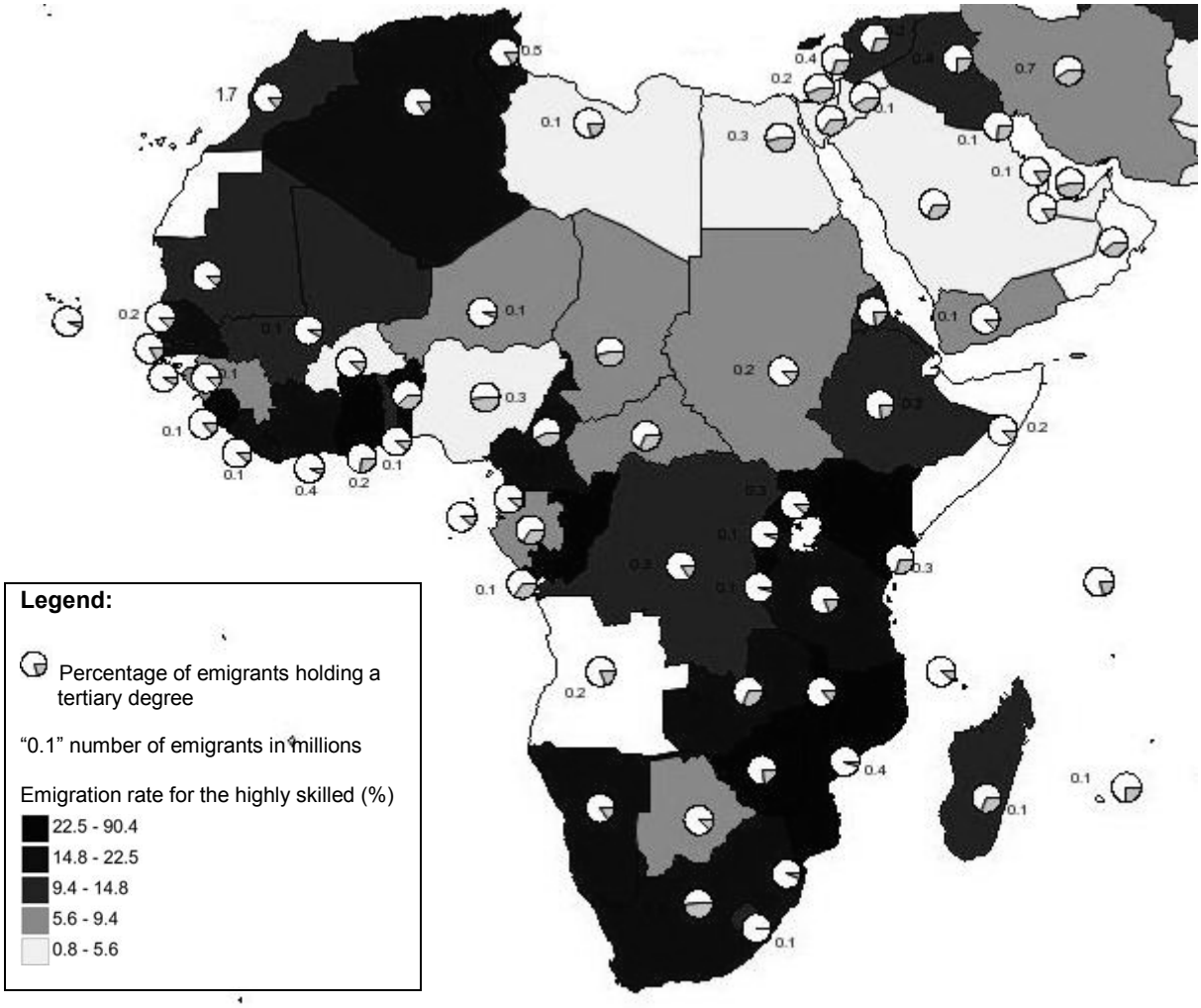
File reference	1	2	3	Definition of variables		Main source of data	Observations
Main theme	Education, Age a and Gender	Labour force status	Occupation				
Variables included	- County of residence - Country of birth - Education - Gender - Age	- Country of residence - Country of birth - Education - Gender - Labour force status	- Country of residence - Country of birth - Education - Gender - Occupation				
Reference population	All 15+	All 15+	15+ employed	Foreign Born status	Education		
Seychelles	Census, 2000	Census, 2000	Census, 2000	Nationality	ISCED levels	Country	
Singapore	Census, 2000	-	-	Nationality	Mapping	Country	The variable age is not available. The original data of country of birth included the following categories: "Malaysia", "Indonesia", "China, Hong Kong and Chinese Taipei", "South Asia" (including India, Pakistan, Bangladesh and Sri Lanka), "Other Asian Countries", "European Countries", "USA and Canada" and "Others". "India" could be identified from the category "South Asia", based on information from the United Nations Global Migration Database version 0.3.6 by applying the number of Indian-born by sex and age, whereas the educational attainment structure remained unchanged. The other countries of the "South Asia" category, Pakistan, Bangladesh and Sri Lanka, were classified with "Other Asian countries" into one category "Asia". The category "China, Hong Kong and Chinese Taipei" is coded as China.
Slovak Republic	Census, 2001	Census, 2001	Census, 2001	Country of birth	ISCED levels	Country	
Slovenia	Census, 2002	Census, 2002	Census, 2002	Country of birth	ISCED levels	Country	There is no information to identify whether the levels were completed or not.
South Africa	Census, 2001	Census, 2001	Census, 2001	Country of birth	Mapping	IPUMS	The age groups are 15-24, 25-64 and 65. Persons aged 66 and over are therefore missing for this country. Since individuals between 15 and 16 are not included in the original database, in File 2 their labour status is coded as "unknown" (99).
Spain	Census, 2000	Census, 2000	Census, 2000	Country of birth	ISCED levels	Country	The age groups are 16-24, 25-64 and 65+. Persons aged 15 are therefore missing for these three countries.
Sri Lanka	Census, 2001	Census, 2001	-	Country of birth	ISCED levels	Country	
Sweden	Registers, 12/2003	Registers, 12/2003	Registers, 12/2003	Country of birth	ISCED levels	Country	Due to the unavailability of information on educational attainment for persons older than 74, the coverage is limited to people aged 16 to 74 years old in File 1, while it includes all people aged 15 and older in File 2 and people aged 16 and older in File 3.
Switzerland	Census, 2000	Census, 2000	Census, 2000	Country of birth	ISCED levels	Country	
Tanzania	Census, 2002	Census, 2002	Census, 2002	Country of birth	Mapping	IPUMS	
Thailand	Census, 2000	Census, 2000	Census, 2000	Country of birth	Mapping	IPUMS	
Trinidad and Tobago	Census, 2000	Census, 2000	-	Country of birth	Mapping	REDATAM	
Turkey	Census, 2000	Census, 2000	Census, 2000	Country of birth	ISCED levels	Country	The occupations were provided according to ISCO-68, which is not compatible with ISCO-88 at the two-digit level. The data in File 3 is therefore provided under ISCO-68 .
Uganda	Census, 2001	Census, 2001	Census, 2001	Country of birth	Mapping	IPUMS	
United Kingdom	Census, 2001	Census, 2001	Census, 2001	Country of birth	ISCED levels	Country	
United States	Census, 2000	Census, 2000	Census, 2000	Country of birth	ISCED levels	Country	The age groups are 16-24, 25-64 and 65+. Persons aged 15 are therefore missing for these three countries. The occupations were provided according to the Census Bureau Occupation codes, which do not map correctly to ISCO-88, even at the one-digit level. The data in File 3 is therefore provided under the Census Bureau classification (23 categories).
Uruguay	Census, 1996	Census, 1996	Census, 1996	Country of birth	ISCED levels	Country	
Venezuela	Census, 2001	Census, 2001	Census, 2001	Country of birth	Mapping	IPUMS	

Note: ESEG: Enquête socio-économique générale; ESPA: Enquête suisse sur la population active; LFS: Labour force survey; IPUMS: Integrated Public Use Microdata Series; REDATAM: Retrieval of DaTa for small Areas by Microcomputer

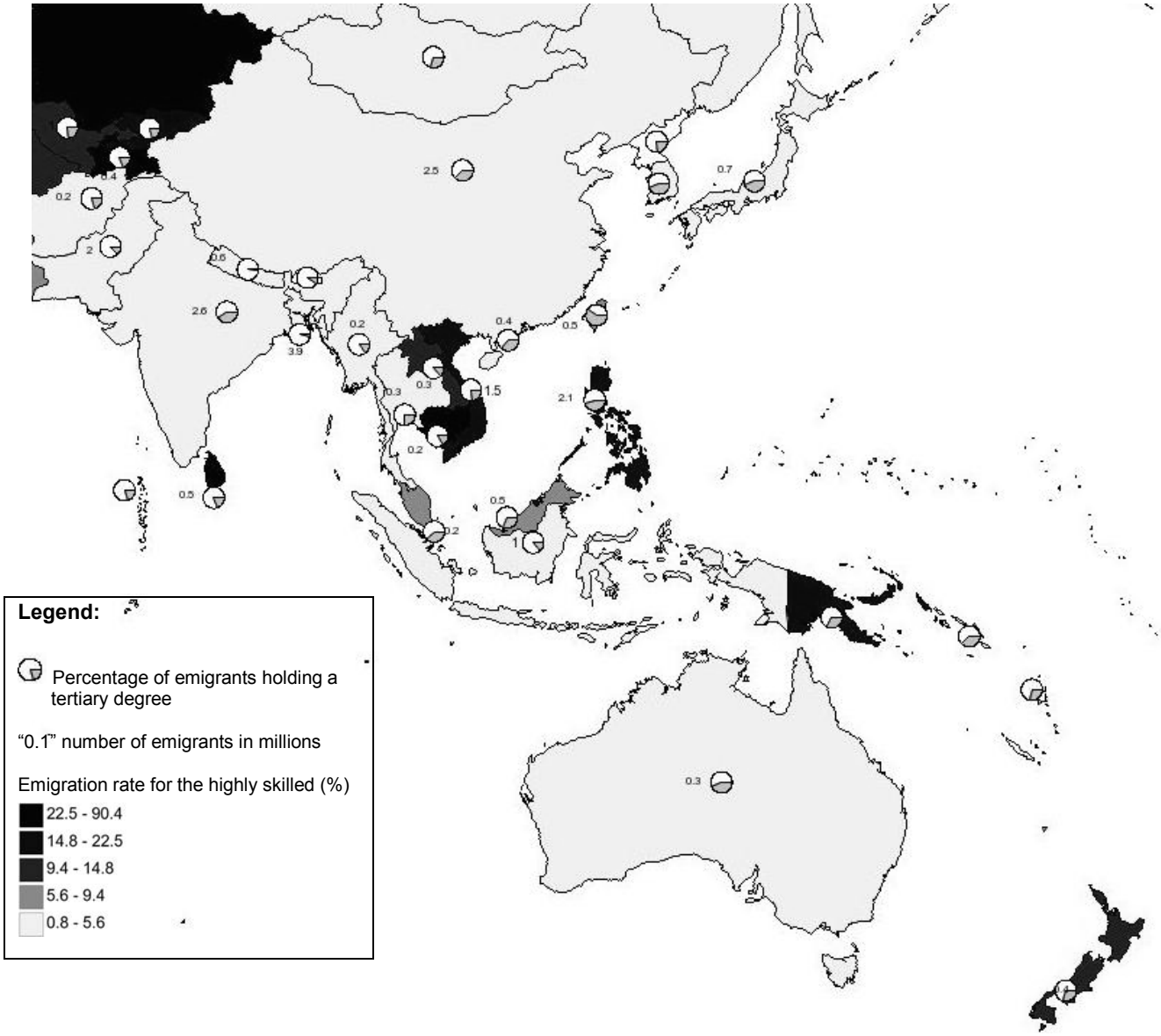
Map A.1: Country coverage in DIOC-E (release 2.0) and forthcoming extension



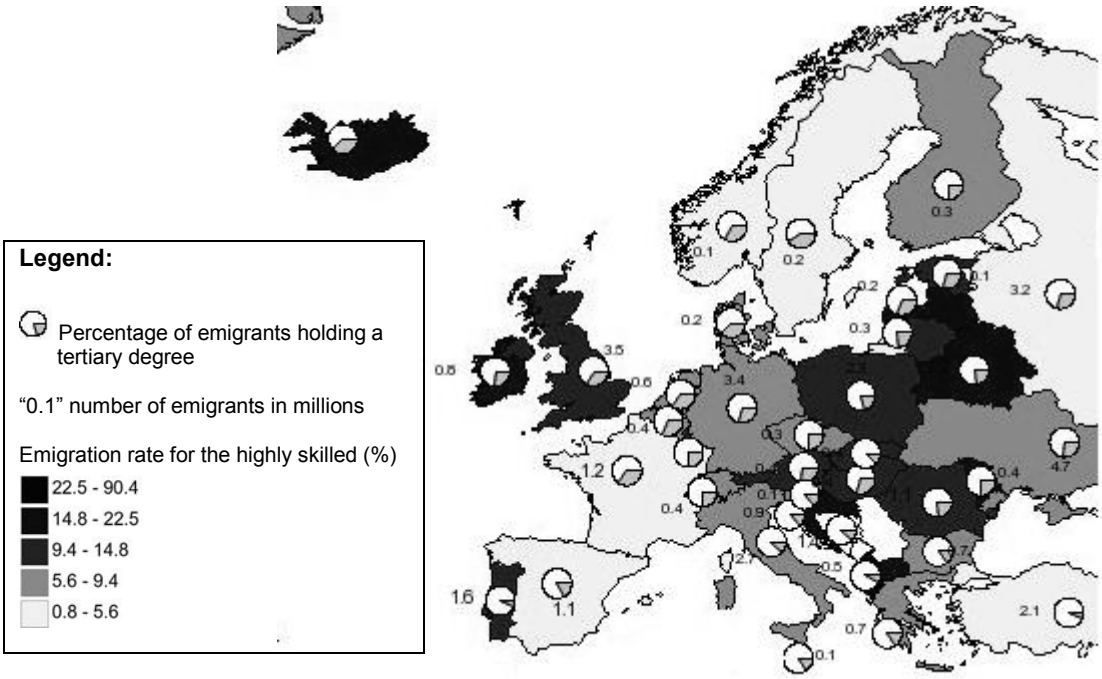
Map A.1 Emigration rates for the highly skilled, number of emigrants by country of birth and by skill level, circa 2000, DIOC-E (release2.0), Africa and Western Asia



Map A.1 (cont.) Emigration rates for the highly skilled, number of emigrants by country of birth and by skill level, circa 2000, DIOC-E (release2.0), Asia and Oceania



Map A.1 (cont.) Emigration rates for the highly skilled, number of emigrants by country of birth and by skill level, circa 2000, DIOC-E (release2.0), Europe



Map A.1 (cont.) Emigration rates for the highly skilled, number of emigrants by country of birth and by skill level, circa 2000, DIOC-E (release2.0), America

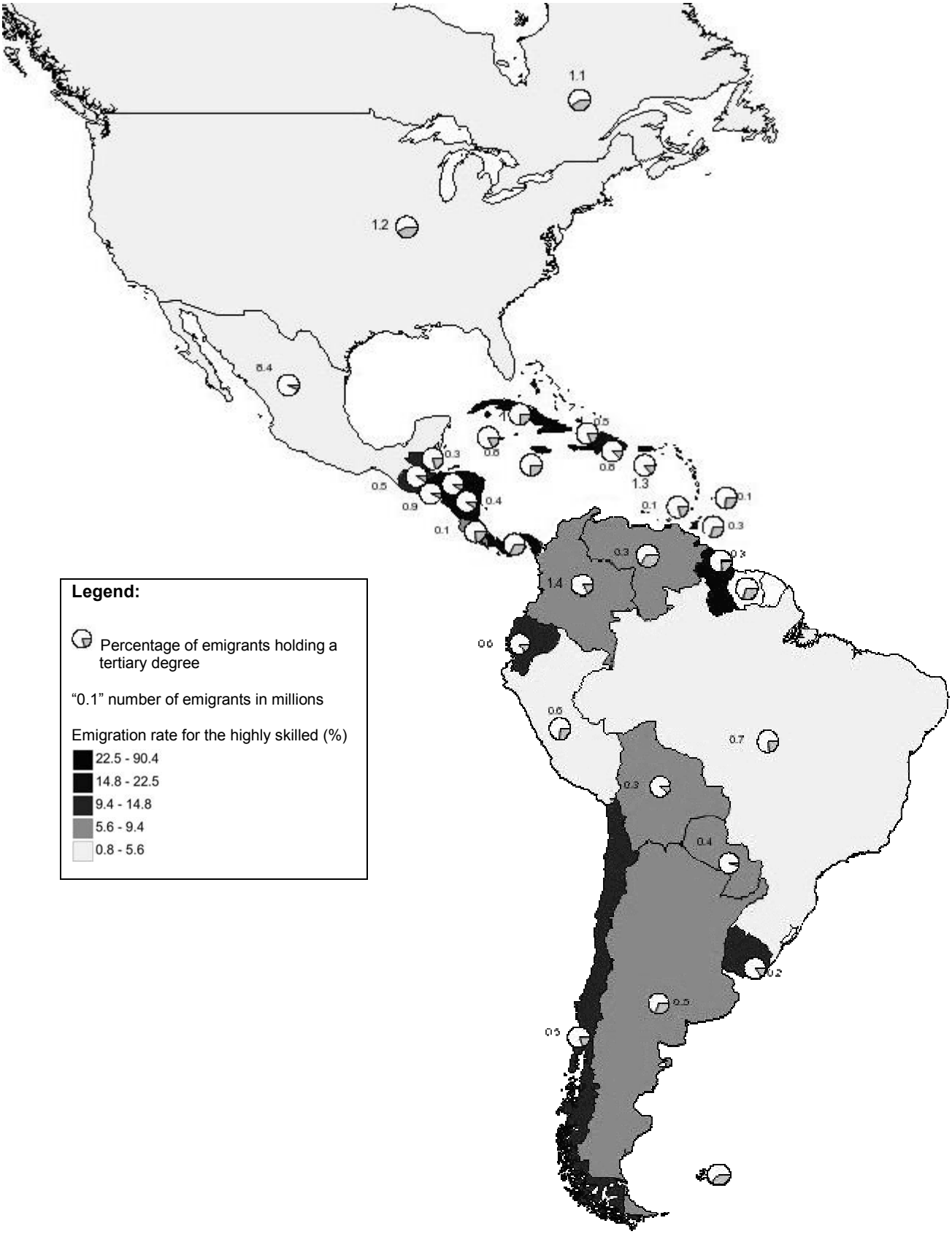


Table A.3 Ratios between emigration rates for the highly skilled based on DIOC and on DIOC-E including new education data

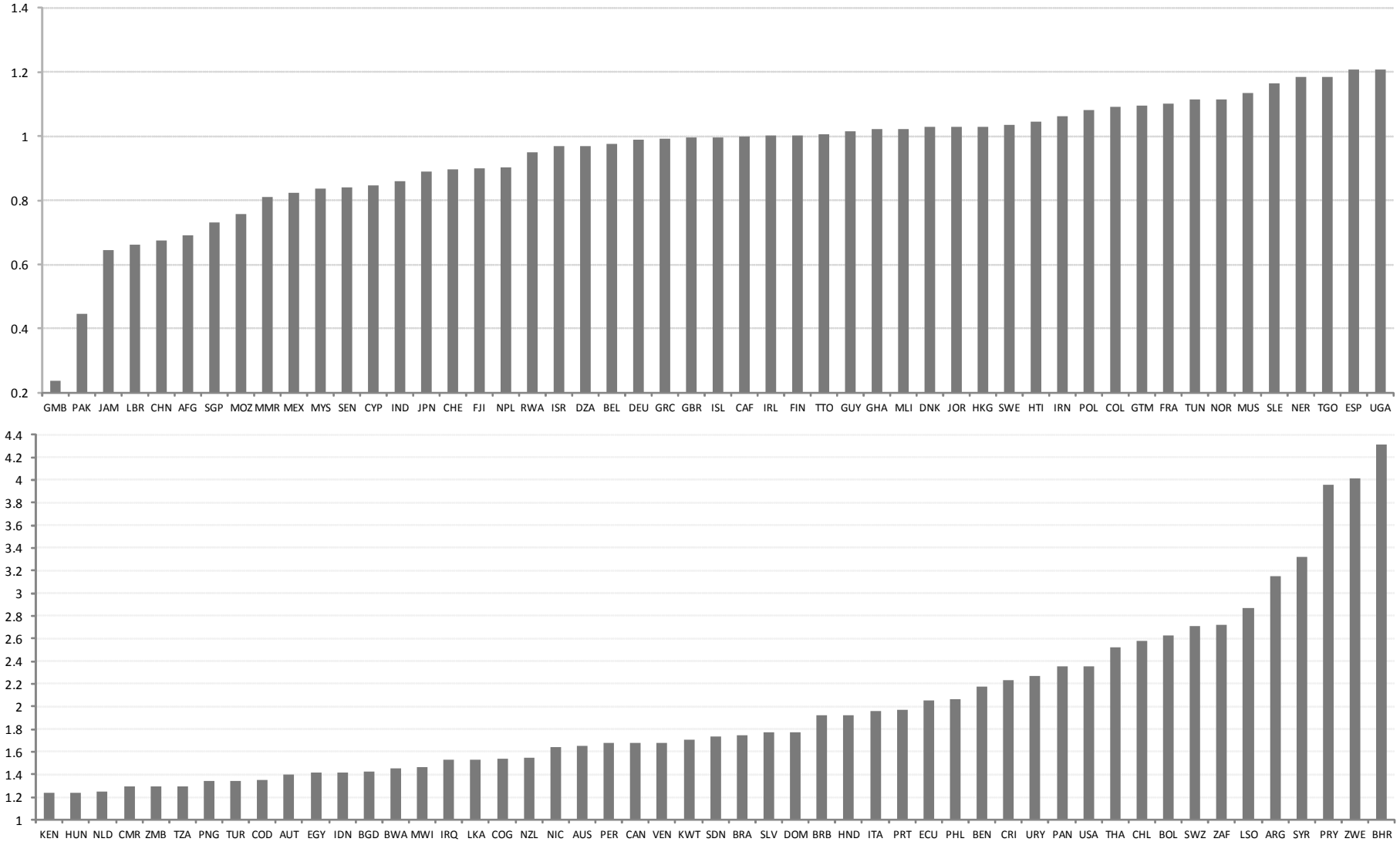


Table A.4 Data source and descriptive statistics for the econometric analysis

	Unilateral dataset, non-OECD origin countries only				Bilateral dataset, non-OECD origin countries only							
					OECD destination countries				Non-OECD destination countries			
Variables	Mean	Std. Dev.	Min	Max	Mean	Std. Dev.	Min	Max	Mean	Std. Dev.	Min	Max
Total emigration rate to OECD countries (log)	-4.01	1.55	-7.09	-0.39	-10.90	3.30	-20.68	-0.81				
Total emigration rate to non-OECD countries (log)	-4.88	1.73	-9.25	-1.49					-13.99	2.79	-20.68	-1.56
Tertiary emigration rate to OECD countries (log)	-2.25	1.31	-5.81	2.27	-8.68	2.88	-17.60	1.64				
Tertiary emigration rate to non-OECD countries (log)	-4.11	1.64	-8.93	-1.09					-11.27	2.41	-17.60	-1.19
Selection ratio to OECD countries (log)	1.76	1.25	-0.81	4.68	2.22	1.36	-2.42	5.69				
Selection ratio to non-OECD countries (log)	0.77	1.06	-3.70	4.40					2.72	1.33	-2.87	5.69
GDP per cap. 1985-2000 (log)	8.18	1.04	5.96	10.29								
GDP per cap. 1985-2000 (log) – Origin					8.18	1.04	5.96	10.29	8.18	1.04	5.96	10.29
GDP per cap. 1985-2000 (log) – Destination					9.84	0.37	8.82	10,46	8.34	0.87	6.36	10.01
Difference Destination-Origin GDP per cap. 1985-2000 (log)					1.66	1.10	-1.47	4.50	0.16	1.36	-3.94	4.06
Population 1985-2000 (log)	15.74	1.71	11.20	20.88								
Population 1985-2000 (log) – Origin					15.74	1.71	11.20	20.88	15.74	1.71	11.20	20.88
Population 1985-2000 (log) – Destination					16.47	1.35	12.89	19.37	15.99	1.55	11.20	20.61
Area (log)	11.80	2.36	3.33	16.65								
Area (log) – Origin					11.80	2.35	3.33	16.65	11.80	2.35	3.33	16.65
Area (log) – Destination					12.23	1.79	7.86	16.12	11.94	2.05	6.13	16.65
Distance (log)					8.70	0.71	4.39	9.85	8.80	0.78	4.66	9.90
1 for common official or primary language					0.11	0.31	0.00	1.00	0.15	0.35	0	1
1 for pairs ever in colonial relationship					0.03	0.18	0.00	1.00	0.01	0.07	0	1
Island	0.17	0.37	0.00	1.00	0.17	0.37	0.00	1.00	0.17	0.37	0	1
Landlocked	0.21	0.41	0.00	1.00	0.21	0.41	0.00	1.00	0.21	0.41	0	1
Official lang. English	0.28	0.45	0.00	1.00	0.28	0.45	0.00	1.00	0.28	0.45	0	1
Official lang. French	0.18	0.39	0.00	1.00	0.18	0.38	0.00	1.00	0.18	0.38	0	1
Official lang. Spanish	0.15	0.36	0.00	1.00	0.15	0.36	0.00	1.00	0.15	0.36	0	1
Years of war 1950-2000 (log)	0.77	1.08	0.00	3.33	0.77	1.07	0.00	3.33	0.77	1.07	0	3.33
Religious fractionalisation	0.43	0.23	0.00	0.86	0.43	0.23	0.00	0.86	0.43	0.23	0	0.86
Restrictions to women mobility	0.09	0.29	0.00	1.00	0.09	0.29	0.00	1.00	0.09	0.29	0	1
Observations	133				3458				8184			

Data Sources:

Total emigration rate: *DIOC-E 2000 (release 2.0) and United Nations World Population Prospects 2008*; Tertiary emigration rate: *DIOC-E 2000 (release 2.0*, *Barro and Lee (2010), Lutz et al. (2007)*; GDP per capita 1985-2000 (PPP): *Penn World Tables 6.3*; Population 1985-2000: *United Nations World Population Prospects 2008*; Area: *FAO*; Island: *United Nations*; Landlocked: *CEPII*; Official language: *CEPII*; Years of war: *UCDP/PRIO Armed Conflict Dataset*; Religious fractionalization: *Alesina et al. (2003)*; Restrictions to women mobility: *McKenzie (2007)*; Distance: *CEPII*; Common language: *CEPII*; Colony: *CEPII.*

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