Migratory pressures in the long run: international migration projections to 2050

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This article presents bilateral international migration projections to 2050 based on a new methodology that takes into account the population growth both in countries of origin and countries of destination. To do this, the methodology used by Hanson and McIntosh (2016) to project the future migratory flows to a sample of OECD countries is generalised to all countries worldwide. The United Nations population growth forecasts are used as a basis for projecting future migratory flows. The main findings of the exercise indicate that the number of migrants is projected to increase from 2.8% of the world population in 2010 to around 3.5% in 2050, as a result of the strong increase in migrants from India and sub-Saharan Africa. Against this background, and despite the slowdown in demographic growth in Latin America, the United States is expected to continue to receive high net immigration flows and to remain the country with the highest stock of immigrants globally, while continental Europe will post larger net immigration flows.

MIGRATORY PRESSURES IN THE LONG RUN: INTERNATIONAL MIGRATION PROJECTIONS TO 2050

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Introduction

Population projections are one of the essential ingredients for estimating the potential growth rates of economies. Ultimately, demographics and technological progress are the key determinants of growth in the long run. In turn, the changes in a country's population are highly conditional upon migratory movements, incoming (immigration) and outgoing (emigration) alike. However, compared with the projections of changes in the native population, which can be made using birth and death rates that move with relative predictability, migration dynamics are more difficult to anticipate. Indeed, the assumptions habitually used to project migratory changes are usually relatively simplistic. For example, in the United Nations population projections (*World Population Prospects*) it is assumed that future migratory flows will hold constant at their current levels until 2050 and that then they will gradually decline to 50% of that figure by 2100.[1] Eurostat, for its part, uses extrapolations of the past patterns of net migration in the short run and assumes that net migration between countries will converge linearly to zero in the long run.[2] In Spain's case, the National Statistics Institute (INE) assumes in its long-term population projections that the parameters that describe international migration hold constant at the last known value.[3] The absence of a more sophisticated methodology, but one that is in turn readily and consistently applicable to a series of countries, makes the development of new forms of projecting global migratory patterns necessary.

Against this background, this article sets out international migration projections to 2050 made using a new methodology, developed in Campos (2017), on the basis of the work by Hanson and McIntosh (2016). These authors start with the idea that migration between two countries is essentially determined by the relative abundance of the labour factor in the two countries and that, moreover, there are other factors that come to bear, such as geographical distance, certain cultural characteristics (e.g. the same language or a common colonial past) and the differences in the standard of living between the two countries. Hanson and McIntosh apply that methodology to a sample of OECD countries; in this article, the analysis extends to the rest of the world, thereby including some of the countries that are sources of emigration at present and whose domestic demographic dynamics are rapidly changing. Formally, the projections are obtained as predictions of an estimated model that relates migratory flows to the characteristics habitually contemplated in the literature and to the difference in long-term population growth rates.

One of the main findings is that, despite the slowdown in demographic growth in Latin America, the United States will remain subject to immigration pressures from other global regions. That runs counter to the prediction by Hanson and McIntosh based on a more limited sample of countries, which does not include countries of destination with a lower level of development.[4] Also, the number of migrants globally is expected to increase from 2.8% of the world population in 2010 to around 3.5% in 2050. From the standpoint of the source of migration, the regions that are most expected to contribute to the increase in

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1 See United Nations (2015).
2 See Eurostat (2017).
3 See INE (2015).
4 Hanson and McIntosh (2016) use a database that contains a broad set of countries of origin but only countries of destination that belong to the OECD.

the number of international migrants are India and the sub-Saharan African countries. In these countries the high birth rates that would generate demographic pressures, and in turn lead to greater emigration, are forecast to hold in the future.

The second section of this article briefly describes the methodology used to make the projections and discusses their advantages and limitations. The third section sets out and discusses the findings obtained for the main world regions. Finally, the last section draws some brief conclusions.

Methodology for making international migration projections[5]

The methodology used to obtain the projections is based on the positive relationship observed between demographic pressure and migration: particularly numerous cohorts of workers who join a country's labour market generate incentives for emigration to other countries. Also, a relative shortage of workers in countries of destination with low demographic growth rates attracts international immigrants [Hatton and Williamson (2003)]. Economic theory and empirical evidence indicate that migratory flows are also stronger between countries that are geographically close, share a language or have other factors in common [Anderson (1979, 2011)].

Starting with these premises, the article estimates an enlarged gravity equation that captures the relationship between the change in the bilateral emigration rate and various demographic and geographical variables. Specifically, the equation estimated is the following:

$$\Delta m_{od} = \eta_o + \eta_d + \lambda (g_o - g_d) + \kappa \ln \frac{GDP_o}{GDP_d} + \sum_i \gamma_i \tau_i + \sum_i \phi_i (g_o - g_d) \times \tau_i + \varepsilon_i$$

In this equation, m_{od} represents the percentage of the population of the country of origin "o" that resides in the country of destination "d". The variable Δm_{od} refers to the change in that percentage over a decade. On the right-hand side of the equation, the explanatory variables η_o and η_d are, respectively, fixed effects by country of origin and of destination, i.e. they respectively capture characteristics of the countries of origin and of destination that are not observable and that do not change over time (e.g. climate, seismic activity, etc.). The expression $(g_o - g_d)$ measures the difference in population growth rates between the country of origin (g_o) and the country of destination (g_d). Each of these rates is calculated as the growth of the size of the cohort with ages spanning from 0 to 14 in a period of four decades. No distinction is made between native and immigrant population. This variable is laggied by a decade in the regression[6] to prevent a problem of inverse causality, since the total population will be the sum of the native population and net emigration.

Also on the right-hand side of the equation is the relative GDP per capita between the country of origin and of destination, as a measure of the difference in the standard of living (or as a proxy of the difference in relative wages). This variable is also lagged – in this case by 30 years – to avoid a problem of inverse causality. The remaining variables, denoted τ_i, are measures of proximity or distance habitually used in gravity migration regressions, and which in this specification appear both individually and interacted with the difference in population growth rates $(g_o - g_d)$. Included among the distance variables are geographical distance (measured in kilometres between the most populated cities in each country) and

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5   Details of the methodology used to make the forecasts are set out in Campos (2017).
6   That is to say, if Δm_{od} refers to the change between 2000 and 2010, then the difference in growth rates $(g_o - g_d)$ will be constructed on the basis of population growth rates between 1950 and 1990.

cultural distance (proxied by a series of binary variables that indicate whether the pair of countries in question shares a language, a colonial relationship or a land border). Also included among the τ_i variables are indicators of the previous proportion of immigrants of the nationality of the country of origin, as this variable has been proven to be of help in predicting the direction and intensity of migratory flows.[7]

The gravity equation is estimated for bilateral migrations from 2000 to 2010, with data drawn from the World Bank's GBM database. Subsequently, the values of the estimated parameters are used to project changes in future migration rates to 2050, based on the United Nations projections of the future course of the demographic variable $(g_o - g_d)$ for the native population. The projections thus obtained refer to the net change in the number of migrants in each decade to 2050, and from these changes the total number of migrants per country at the end of each decade is inferred.

As earlier indicated, the methodology used is based on the existing relationship between migration and demographic pressures, but it should be borne in mind that international migration is also influenced by socio-economic factors, migratory policies, wars and natural disasters, inter alia. This is why the findings of this article should not be interpreted as predictions, but as the best possible projections obtained on the basis of a restricted set of variables, with the aim of providing results for the broadest possible set of countries.[8]

Projections

Before analysing the migration projections, it is worth reviewing current migration patterns. Table 1 details the 25 countries with the largest numbers of immigrants, based on World Bank data for 2010. The United States stands out as the country with the highest number of immigrants: its more than 40 million immigrants account for 20.7% of total global migrants and for 13% of the US population. Significantly, of the first 25 countries of destination of immigration, only nine are advanced countries and 14 developing nations, which demonstrates that international migration is not targeted exclusively on the developed countries.

Table 2 sets out the main countries of origin of international migration. Mexico is the leading global source of migrants, with 11.9 million migrants. This figure is equivalent to 10% of Mexico's resident population in 2010 and comprises 6.1% of the total international migrants recorded by the World Bank. Most of these emigrants (11.6 million) live in the United States. Among the first 25 countries of origin of migration, developing countries are in the majority, although six developed countries also feature.

As mentioned in the previous section, the projections are made with a horizon terminating in 2050. Aggregating the global-level information, the projection of the total number of migrants globally is expected to increase from 190 million people in 2010 to 334 million in 2050 (see Chart 1). In relative terms, that entails a progressive increase from 2.8% of the world population in 2010 to 2.9% in 2020, 3.1% in 2030, 3.3% in 2040 and up to 3.5% in 2050.

The origin of these migrants is shown in Chart 2. The left-hand panel shows the absolute number of emigrants while the right-hand panel gives the percentage accounted for by

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7   See McKenzie and Rapoport (2007), Beine, Docquier and Özden (2011) and Docquier, Peri and Ruyssen (2014).
8   In future extensions to this paper, an attempt could be made to broaden the methodology to include changes in migratory policies, especially in the countries of destination. If changes are observed in these variables in the 2000-2010 decade, the methodology allows for the inclusion of these additional variables as regressors in the equation being estimated. Another extension to this paper is to use different demographic growth scenarios and to compare their effects on international migration.

	Country of destination	Migrants (000s)	% of population at destination	% of global migrants
1	United States	40,154	13.0%	20.7%
2	Russia	11,793	8.2%	6.1%
3	Germany	9,784	12.2%	5.1%
4	Saudi Arabia	7,289	25.9%	3.8%
5	Canada	7,027	20.6%	3.6%
6	Spain	6,892	14.8%	3.6%
7	United Kingdom	6,788	10.8%	3.5%
8	France	6,595	10.5%	3.4%
9	Australia	5,441	24.6%	2.8%
10	India	5,337	0.4%	2.8%
11	Ukraine	4,932	10.8%	2.5%
12	Italy	4,379	7.3%	2.3%
13	United Arab Emirates	3,293	39.5%	1.7%
14	Kazakhstan	3,071	18.8%	1.6%
15	Jordan	2,957	45.4%	1.5%
16	Israel	2,724	36.7%	1.4%
17	Ivory Coast	2,366	11.8%	1.2%
18	Malaysia	2,301	8.2%	1.2%
19	Hong Kong	2,296	32.8%	1.2%
20	Japan	2,176	1.7%	1.1%
21	Iran	2,108	2.8%	1.1%
22	Singapore	1,879	37.0%	1.0%
23	South Africa	1,863	3.6%	1.0%
24	Netherlands	1,599	9.6%	0.8%
25	Kuwait	1,572	51.4%	0.8%

SOURCE: Own calculations on basis of World Bank data.

these emigrants in the population of origin. For those countries in which the emigration rate is close to 10% (such as Mexico and the former Soviet republics), the projections do not involve a significant increase in that rate. Indeed, for the Eastern European countries the emigration rate falls to below 8% in 2050. However, for sub-Saharan Africa and India the projection entails increases in the emigration rate, albeit to still-low rates in 2050, since the starting point is at very low levels. Even so, these two regions undergo strong increases in their emigration in absolute numbers, owing to their strong population growth figures. On the projections obtained, emigrants from sub-Saharan Africa would rise from 19 million people in 2010 to 78 million in 2050; the rise in emigrants from India would be from 11 million to over 40 million in 2050.

According to the projections, emigration from Middle East and North African countries (MENA) would fall to 2020, rising in the subsequent years; that from Latin America and the Caribbean (LAC), excluding Mexico, would also increase as from 2020. Mexican emigrants would rise from close to 12 million in 2010 to 18 million in 2050, while those from the rest of Latin America would climb by 50% over that period, from almost 20 million to 30 million in 2050.

The projections indicate that the United States would continue to be the country with the largest number of immigrants in 2050 (see Chart 3), with the figure rising from 40.2 million

ORIGIN OF INTERNATIONAL MIGRATION: MAIN COUNTRIES (2010)

TABLE 2

	Country of origin	Migrants (000s)	% of population at origin	% of global migrants
1	Mexico	11,852	10.0%	6.1%
2	India	11,053	0.9%	5.7%
3	Russia	10,090	7.0%	5.2%
4	China	8,218	0.6%	4.2%
5	Ukraine	6,002	13.1%	3.1%
6	Bangladesh	4,961	3.3%	2.6%
7	United Kingdom	4,548	7.3%	2.3%
8	Pakistan	4,522	2.7%	2.3%
9	Turkey	4,239	5.9%	2.2%
10	Philippines	4,213	4.5%	2.2%
11	Egypt	3,565	4.3%	1.8%
12	Germany	3,402	4.2%	1.8%
13	Italy	3,359	5.6%	1.7%
14	Kazakhstan	3,340	20.5%	1.7%
15	Poland	3,067	8.0%	1.6%
16	Morocco	3,014	9.4%	1.6%
17	Romania	2,765	13.6%	1.4%
18	Palestine	2,707	66.5%	1.4%
19	Indonesia	2,321	1.0%	1.2%
20	United States	2,272	0.7%	1.2%
21	Vietnam	2,201	2.5%	1.1%
22	Portugal	2,139	20.2%	1.1%
23	Afghanistan	2,135	7.6%	1.1%
24	South Korea	2,033	4.1%	1.1%
25	Colombia	2,018	4.4%	1.0%

SOURCE: Own calculations based on World Bank.

GLOBAL MIGRATION PROJECTIONS

CHART 1
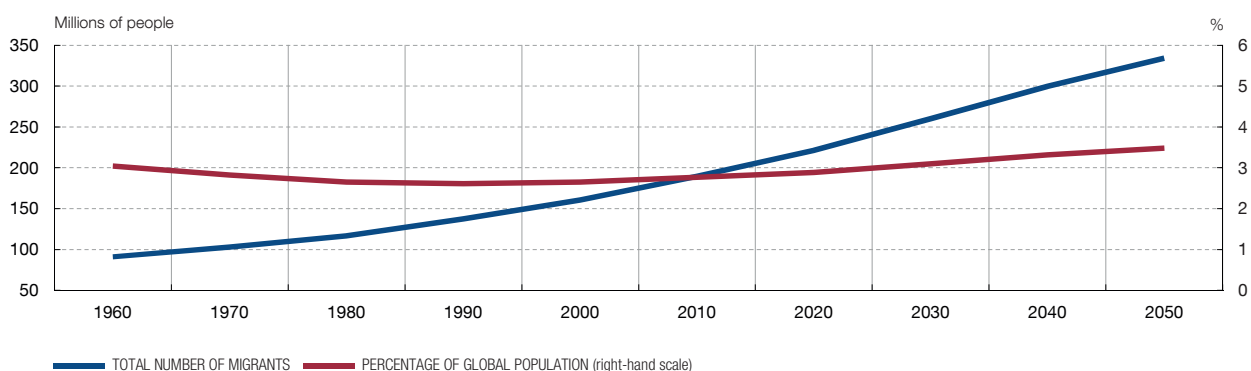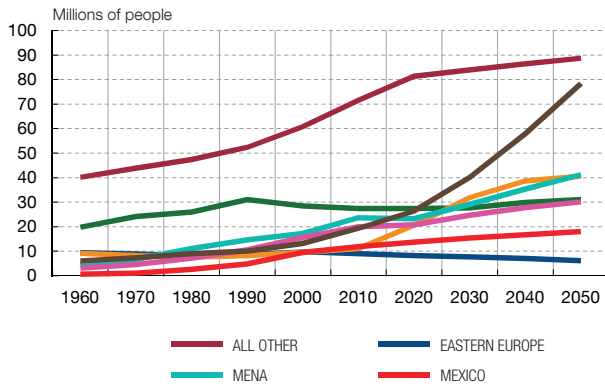

SOURCE: Own calculations.
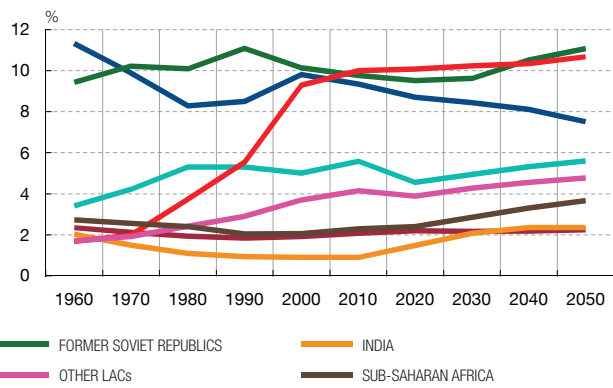
GLOBAL MIGRATION PROJECTIONS   CHART 2

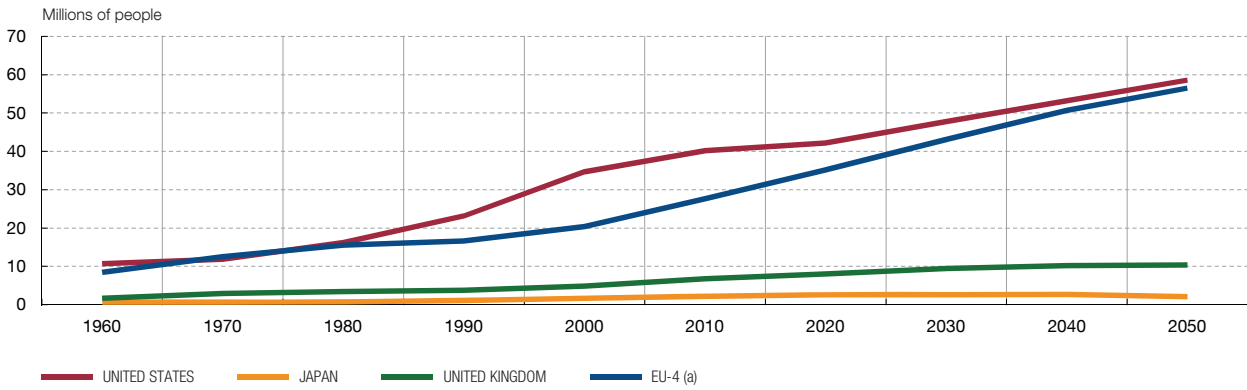EMIGRANTS BY REGION   EMIGRANTS BY REGION (% OF POPULATION)

Millions of people   %

ALL OTHER	EASTERN EUROPE	FORMER SOVIET REPUBLICS	INDIA
MENA	MEXICO	OTHER LACs	SUB-SAHARAN AFRICA

SOURCE: Own calculations.

GLOBAL MIGRATION PROJECTIONS   CHART 3

IMMIGRANTS IN ADVANCED ECONOMIES

Millions of people

UNITED STATES	JAPAN	UNITED KINGDOM	EU-4 (a)

SOURCE: Own calculations.

a Germany, Spain, France and Italy.

in 2010 to 58.6 million in 2050. However, continental Europe would receive the largest inflow of migrants among developed countries. The number of immigrants in the four biggest continental European economies (Germany, Spain, France and Italy) would rise from 27.7 million in 2010 to 56.5 million in 2050, a figure only slightly lower than that of the United States. The number of immigrants in continental Europe grows strongly in the projections because of Europe's relative geographical proximity to the African countries with high demographic growth rates.

These results for Europe should, however, be qualified in two respects. Firstly, the projection is surely overestimated for countries that posted temporarily high migration growth between 2000 and 2010, as might be the case of Spain. The years taken to estimate the equation are for the 2000-2010 period, in which Spain attracted an unparalleled number of immigrants compared with the previous decades or in the years to date in the following decade, meaning that the estimated parameters place Spain as an atypically attractive migration destination, giving rise to an overly high projection for the years 2020-2050. The second caveat, operating in the opposite direction, is that from 2000 to 2010 the

migratory waves of refugees from conflict zones in North Africa and the Middle East had not yet peaked, meaning that the projections for some countries, such as Germany, no doubt underestimate the real number of immigrants in 2020, the first year of the projection, and in the following years.[9] Moreover, in the case of the United Kingdom, its exit from the EU and the possibility that Brexit may affect the free-movement regime might alter migratory flows between European countries.

The case of the United States is of particular importance owing to the fact that its migratory policies are adopting a restrictive bias, probably as a reaction to the growing discontent of voters, who in many cases have a warped perception of the true economic effects of the immigration phenomenon. The projections by Hanson and McIntosh (2016) predicted that the number of immigrants would flatten out at the current level as demographic growth in Latin America – the main region of origin of migration towards the United States – slowed, with the demographic pressures that push migrants out towards the United States thereby weakening. This fact remains present in the estimates obtained in this paper, but the results indicate that the United States will be exposed to strong migratory pressures from Asia and sub-Saharan Africa, which the aforementioned authors did not detect with the use of their database.

Chart 4 depicts the projections for immigrants for a set of developing countries. The panel shows the biggest countries of destination of immigration in different regions of the world. Chart 4.1 shows three former Soviet republics that have a large number of immigrants: Russia, Ukraine and Kazakhstan. One characteristic of these republics is that there are strong cross-migratory links. For example, according to World Bank data, in 2010 there were 3.7 million Ukrainian citizens living in Russia whereas the number of Russian citizens in Ukraine totalled 3.6 million. Likewise, that same year there were 2.2 million Kazakhs resident in Russia and 2.6 million Russians in Kazakhstan. The projections indicate that the number of immigrants in Russia and Ukraine will remain constant, while in Kazakhstan it will increase. In the three countries, the demographic growth outlook is similar, meaning that major additional flows to the current strong cross-presence are not projected. In the case of Kazakhstan, the greater proximity to countries with higher demographic growth entails greater immigration pressures. Strong economic growth also acts as a magnet in this country.

Chart 4.2 features a selection of Asian countries. According to the projections, the number of immigrants will increase in all these countries, with the exception of India. This is because the United Nations forecast high demographic growth rates in India and, therefore, this means that this country is less attractive to foreign migrants. Widespread increases are observed in the number of immigrants for African countries (see Chart 4.3). Sub-Saharan Africa is the region with the highest projected birth rates and there is some divergence across the region's countries. That gives rise to large migratory flows across the region's countries in the projections. It is important too to mention the strong growth in immigration into the South African Republic from 2000 to 2010, which might bring about an overestimation of future migration, as discussed in the case of Spain.

Finally, Chart 4.4 features the main countries of destination of Latin America. For Argentina, the projections indicate a progressive reduction in the number of immigrants, reflecting a reduction in birth rates in the countries that were traditionally the origin of immigrants, and

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9 The problems referred to are not easy to solve with this methodology. The usefulness of the methodology used here resides in its relatively easy application to a large number of countries, many of them developing countries, for which it is difficult to obtain reliable projections in any other way.

a poorer Argentine per capita GDP performance in relative terms. For Brazil, a change in trend is projected: as from 2020, the number of immigrants is expected to begin to grow, breaking the previous declining trend, due partly to the reduction in Brazilian demographic growth rates. In the case of Mexico, the transition towards lower population growth rates, and the growth of its per capita GDP, will transform this country into a significant recipient of migrants, especially from Central America.

Conclusion

This article has described the international migration projections obtained through a new methodology, which enables projections to be made for all pairs of countries in the world using a very small set of explanatory variables. The demographic variables required can be readily obtained from the United Nations projections. This is an advantage, especially in the case of developing countries, for which statistical information is not so abundant. The potential uses of this methodology include the preparation of migration and population scenarios, which can feed into projections of long-term potential output growth.

The methodology used is based on the existing relationship between migration and demographic pressures; it does not incorporate changes in migratory policies and is not capable of anticipating events such as conflicts or natural disasters, which might alter the results of the projection. The projection exercise suggests that migratory flows towards the United States will hold up and that there will be a bigger influx of immigrants into continental Europe. Among the emerging countries, Mexico is expected to become a destination for immigration, while continuing to be a major source of emigrants. According to the projections, the increase in the number of migrants globally will stem from India and from sub-Saharan Africa, where high demographic growth rates are forecast in the coming decades.

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