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ICPD and migration

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I. Drivers of migration

A recently published report on International Migration Drivers by the Knowledge Centre on Migration and Demography of the European Commission (KCMD) [1] estimates the relevance of drivers of migration by looking at the statistical relation between migration data and demographic, economic and geographic country variables from international sources. Separate models consider different forms of migration (general world migration, asylum seekers, and residence permits to the EU for education, work and family re-unification) and different levels of development of countries of origin. The country (macro) perspective is complemented by an analysis of the individual characteristics of people who express an intention to migrate in the Gallup World Poll. In addition to the quantitative part, the report provides a review of the effect of migration policies, estimates of the number of people who will be affected by climate change and final considerations about the future of world migrations emerging from the understanding of the relevance of the different drivers of past migrations.

A. Main trends in world migrations

- Trends of international migrations, measured through the evolution of the stock of migrants by income level of countries of origin and of destination, suggest that migrations are increasingly directed towards high income countries and in particular towards Europe and Northern America. Migrations from low income countries remain relatively confined both in absolute and in relative terms (Figure 1).
- In the case of migration from Africa, despite the general perception about an imminent exodus directed in particular towards Europe, there is no evidence about a fundamental change in respect of past trends. Migrations from Sub Saharan Africa remain mostly within the African Continent (Figure 2) [2]. However, data on residence permits and asylum seeker from Sub-Saharan Africa towards Europe show a trend for substitution between forms of migration, with an increasing number of asylum applications against a stable or slightly declining number of residence permits. This change is not necessarily implying a change in the underlying structural factors driving migrations.
- At individual level, data from the Gallup World Poll show that there is a consistent gap between those wishing to move abroad and those preparing to make an international journey. While more than 20% of the population expresses a desire for international migration, less than 1% prepares to migrate (Figure 3). Actual migration flows can be estimated at an even lower ratio of around 0.1% of the world population. These gaps are indicative of the fact that, despite the reduction of the cost of travel linked to globalization, international migration remains a relatively exceptional life event subject to high constrains.
- B. Development
- There is a complex, non-linear relationship between economic development and migration. In general, migration first increases and then decreases with a country's economic development. This is consistent with the mobility transition and migration hump theories which describe an inverse U-shaped relation between migration and development [3–6]. In our models this non-linear relationship is confirmed by the fact that in middle income countries, GDP per capita has a positive relation with migration whereas in high income countries the relation becomes negative (Figure 4).
- Poverty is representing an important driver for migrations of asylum seekers (Figure 4). This factor is acting at the level of countries and not necessarily at the level of individuals and is interacting with other drivers such as political terror, democracy, and conflicts.
- C. Demography²
- In low and middle countries high fertility rates do not result in higher likelihood for migration (Figure 4). This apparently counterintuitive relation could be attributed to the positive association between high fertility rates and poor economic conditions which represent hindering factors for migration. An additional explanation is that a reduction of total fertility rate is indirectly capturing

 $^{^{2}}$ A more comprehensive treatment of different migration scenarios in the context of demographic forecasts is being carried out in a dedicated project between JRC and IIASA. The preliminary results of this project are included in [7].

a change towards demographic profiles characterized by a higher share of young adults or so called youth bulge.

- Considering the higher likelihood for migration of young adults, as demographic profiles in low income countries will evolve towards a structure characterized by a higher share of young adults (Figure 5) we should expect an increase of the overall emigration rates from these countries.
- Independently from changes in the likelihood for emigration, the ratio of immigrants in high income destination countries in Europe is destined to increase simply as a consequence of different demographic trends in countries of origin and destination. Also with constant emigration rates, the combined effect of the expansion of population in Africa and the reduction in Europe could result in an increase of the ratio of immigrants in Europe from the current 10% to around 14% by 2100 (Figure 6).
- D. Geography
- Migratory flows are confined to well defined and relatively stable bilateral corridors between countries of origin and destination. These corridors are established on the basis of commercial relations, migrants networks, and linguistic and colonial links (Figure 4). In particular network effects are systematically emerging in econometric models as the most relevant driver of migration.
- Despite the relative stability of migration corridors, flows from low income countries are becoming more diversified and covering longer geographical distances (Figure 7). The tendency for diversification is in line with similar patterns encountered in the case of the trade and could be considered as a sign of the gradual opening of low income countries to international migration systems.
- E. Individual drivers
- An analysis of the individual characteristics of those who have expressed a wish to migrate confirms the patters emerging from the analysis of drivers at country level. Those preparing to migrate are more likely to be young, male, foreign-born, more connected abroad and more educated (Figure 8). Coherently with the migration hump hypothesis, in middle income countries higher individual income fosters preparation for migration while in rich countries the relation is inverse and in low income countries it is not statistically significant.
- F. Migration, urbanisation and mobility
- International migrations and other forms of human mobility are closely interlinked and expanding with the rise of income levels of countries of origin. As already postulated by the migration transition theory there is continuum between rural to urban migration, and international migration. All forms of human mobility are subject to the same influences of modernization, development and demographic transitions.
- Patterns of urbanization can be explored also at high spatial resolution through an analysis of building footprints like currently done with the Human Settlement Layer maintained at JRC [8]; however, it is difficult to relate this spatial information with international migration flows.
- At aggregate level statistical relations between urbanization and international migration flows normally show the same non-linear relation depicted for income. Urbanization is interacting with the other components of development such as education and fertility in demographic and mobility transitions and therefore it is difficult to isolate its role in respect of international migrations.

II. Migrants in cities

The KCMD has assembled a data set based on the 2011 Census in 8 EU Member States which shows the concentration of migrants by origin at high spatial resolution (grid cells of 100 by 100 m). With such data it is possible to analyze patters of segregation, diversity and concentration at the level of neighborhoods and compare these patters across small and large cities, countries of destination and by origin of the migrants. First results of this line of work have been included in a chapter of the Divided City report published by OECD in 2018 [9]. This chapter, after describing patters of segregation in almost 45000 Local Administrative Units in France, Germany, Ireland, Italy, the Netherlands, Portugal, Spain, and the United Kingdom, draws the following conclusions.

• Although common knowledge suggests that migrants tend to gravitate around large cities, high levels of agglomeration are often also present in medium and small size cities and in rural areas.

- Clustering is higher in general for migrants from third countries, for migrants from South America and South-East Asia and for specific countries of origin which have a recent history of conflicts.
- The large size of the migrant community reduces the clustering, but it increases its isolation.
- Migrants coming from distant and fragile countries are more likely to be isolated compared to migrants from neighboring countries.

More recent research on the temporal dynamics of concentration of migrants between the 2001 and 2011 censuses for Italy and Netherlands provides new empirical evidence about ongoing processes of desegregation. After a certain threshold of concentration areas which had high concentration in the past are experiencing a reduction in the share of migrants (Figure 9). This evidence is supporting an assimilationist model of integration. Despite the increase of the share of migrants at the aggregate level, there are unobserved factors at local level which determine after a certain time from arrival and after reaching certain thresholds of concentration a progressive spatial dispersion in the receiving society. In addition to the effects on integration, residential segregation has a fundamental role in shaping attitudes towards migrants. The size, proximity and segregation of ethnic groups in the physical space of cities can have powerful influences on the salience and stereotyping of the out group and these influences often translate in group bias, the rise of anti-immigration sentiment and populism. Ongoing research by Joint Research Centre of the European Commission is looking at the relation between concentration of migrants and electoral outcomes and how contact with migrants in the local context is influencing attitudes towards migrants migration and integration as expressed in Eurobarometer surveys.

III. Estimates of stocks and flows through non-traditional data sources

The KCDM is exploring the potential of big data and non-traditional data sources for migration. These efforts, strengthened by the KCMD and IOM's Global Migration Data Analysis Centre (GMDAC) initiative "Big Data for Migration Alliance (BD4M)" [10], led to the development of two areas of research. The first one exploits social media advertising platforms to estimate migration stocks and the second one looks at air traffic passenger data to estimate flows of migrants at global scale.

A. Estimates of flows using Facebook data

- Facebook Network data collected via the Facebook advertising platform can be used to estimate stocks of "expats" [11] in various countries. The number of monthly active Facebook Network users can be interpreted as a proxy for population counts, leading to a virtually real-time census, disaggregated by age, sex, country of origin and destination, as well as many other socio-economic and demographic variables. Once the data are calibrated, the estimates significantly correlate with Eurostat statistics (Figure 10).
- The main challenges in using such data are related to biases due to different penetration rates of Facebook, definitions, technological sustainability, and proprietary algorithms. Given these challenges, such data should not be intended to replace official population statistics. The main added values consist in: the provision of higher levels of disaggregation, early signals of emerging trends (Figure 11), capturing forms of migration normally not included in the official definition of migrants and integrating figures in countries where there is limited availability of migration statistics.

B. Estimates of flows estimates through air traffic data

• Air traffic data can be thought of as one of the possible indicators describing the mobility channel between two countries. If a low cost company sets a new route between two countries, or a visa free regime is adopted between them, this normally results in an increase of people moving along that route for e.g. tourism, visiting relatives abroad, business trips as well as short term mobility and migration. Clearly, the flow of the latter would be shaped by the geographic distance, the GPD differential and the stock of relevant people who migrated from and to the two countries. We have developed a regression model which isolates the air traffic flows from the components of travel not related to migration and explicitly takes into consideration the main drivers of migration.

- The model is capable of reproducing EUROSTAT and OECD immigration statistics respectively with R squared values of 0.90 and 0.88³. These results represent significant improvements with respect to current state of the art estimates of global migration flows based on a demographic accounting method [12] (Figure 12).
- The two main added values of our approach of estimation consist in: producing global estimates of migration flows for countries of origin and destination currently not covered by OECD and EUROSTAT statistics (i.e. migration flows between developing countries), and, thanks to the monthly periodicity of the air traffic data, to provide more frequent and recent estimates. Since the data on air passengers is detailed at the level of single airports, in the case of large countries of origin and destination, the model could be used to estimate of migratory flows between specific regions.

³ Differences in respect of official statistics could be either interpreted as errors or as signals of migratory flows not captured by the official definition of migrants. In this sense the model could help to establish a link between the different forms of mobility described in previous chapter.



Figure 1 Stock of migrants by income level of the countries of origin (row) and of destination (columns) in absolute value and as ratio to the population of the countries of origin (1990 and 2017). The size of the symbols is proportional to the absolute value. and the y axis corresponds to the ratio. Source: own elaboration on the basis of data from UNDESA.





Figure 2 Share of the stock of migrants residing in Africa and outside Africa by African region of origin (1960-2017). Source: own elaboration on the basis of data from UNDESA and World Bank.

Migration Preparation

Figure 3 Percentage of population expressing a desire and preparation for migration by continent (2005-2015). Source: own elaboration of data from the Gallup World Poll.

		General emigration from low income countries			General emigration from middle income countries			General emigration from high income countries			Asylum		
Origin	GDP per capita												
	Fertility												
	Expenditure in education					٦.							
	Democracy												
	Political terror												
	Area affected by conflict												
	Population growth												
Origin-destination	Networks												
	Geographical distance												
	Trade												
Destination	GDP per capita growth												
	Employment rate								ſ				
		-0.5	0.0	0.5	-0.5	0.0	0.5	-0.5	0.0	0.5	-0.5	0.0	0.5
Negative relation													

Positive relation

Figure 4 Relevance of the drivers of migration. The charts show the results of 4 statistical models analysing the relation between economic, demographic and geographical characteristics of countries of origin and destination and

Migration Desire

international migration flows and number of asylum applications. The factors with the highest absolute values are meant to have a greater relevance in determining international migration. A negative relation indicates that an increase in the factor is associated with a decrease in migration, while with a positive relation, an increase of the factor implies higher levels of migration.

Age 20-34

Figure 5 Evolution of the age structure of the population (2017, 2050, 2100) by income level of the countries. Blue bars highlight the age groups which have the highest likelihood to migrate. Source: own elaboration on the basis of data from UNDESA demographic forecasts according to the medium variant scenario.

- Latin America and the Caribbean
- Northern America
- Oceania

Figure 6 Simulation of the evolution of the ratio of migrants to the population at destination, considering constant emigration rates as in 2017. Source: own elaboration on the basis of UNDESA statistics of migration and demographic forecasts according to the medium variant scenario.

Figure 7 The left chart shows the average distance between countries of origin and countries of destination weighted on the basis of the stock of migrants. The right chart shows the average of the Gini diversity index calculated on the distribution of migrants across destination. The values are averaged across countries of origin in each income level. Source: own elaboration based on data from CEPII for distances between countries and from UNDESA for the stock of migrants.

0.184 6.726

Figure 8 Results of statistical models analyzing the relation between individual characteristics of persons who have indicated the preparation of migration in the Gallup World Poll (2010-2015). For each variable, the charts report the

odds of the intention to migrate for a particular group compared to the odds of the intention to migrate for the comparison group (e.g. for gender males vs. females). Separate models are used to quantify specific drivers for low, middle and high income countries.

Figure 9 Median changes in the level of concentration of migrants between 2001 and 2011 (y axis) by classes of concentration in 2001 (x axis) and city sizes. Grey bars show 95% confidence intervals. The unit of analysis is represented by equi-population areas including around 100 persons and covering the entire territory of Italy and Netherlands. Source: own elaboration on the basis of spatially detailed Census statistics provided the National Statistical Institutes of Italy and Netherlands.

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Figure 10 Relation between Eurostat statistics on the stock of foreign-born and our estimates based on data from Facebook. Each dot represents the stock for a specific origin, destination, sex and age group. Values are in thousands. The data from Facebook is corrected using a model which takes into account the different penetration rates of Facebook in countries of origin and destination and in each age group. The latest official statistics refer to 01/01/2017, whereas Facebook Network data are extracted in early 2018.

Figure 11 Comparison of figures about stocks of foreign-born from Venezuela to Spain according Eurostat statistics (red), national data published by INE Padron Continuo (yellow) and our estimates based on data from Facebook (blue).

Figure 12 Comparison between OECD statistics on immigration by citizenship, air passenger data (blue and left axis) and our estimates of migration flows based on a model which includes air passers data and other variables on the bilateral drivers of migration (orange and right axis). Each dot represents the flow between a specific origin and destination in 2015.

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