

*The share of immigrants in advanced economies has risen significantly in recent years, while escalating conflicts have caused large refugee flows that have primarily affected emerging market and developing economies. This chapter examines the drivers of migration, its recent evolution, its possible developments going forward, and its economic impact on recipient countries. Four main findings emerge. First, the costs of migration are high and significantly constrain the ability of individuals to move across borders. Second, the pressures from migration on advanced economies will continue to rise, as the population in emerging market and developing economies is expected to continue to grow over the next 30 years. However, higher incomes in emerging market and developing economies would dampen overall emigration pressures. Third, conflicts are an important driver of migration, especially into emerging market and developing economies. In the future, climate-related disasters could possibly intensify emigration, but the evidence of such pressures is limited to date. Fourth, immigration into advanced economies increases output and productivity both in the short and medium term, but these positive effects are not clearly detected for refugee flows in emerging market and developing economies. The findings of this chapter lend support for two main policy conclusions. First, appropriate labor market and integration policies could magnify the positive macroeconomic effects of immigration. That said, distributional dimensions also need to be considered because immigration may affect, at least temporarily, some groups of people native to the country where the immigrants arrive. Second, international cooperation is needed to address large waves of refugee migration, especially into emerging market and developing economies.*

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## Introduction

Human beings have migrated since the dawn of time. In 2019 270 million people in the world were migrants, defined in this chapter as individuals not living in their country of birth. In absolute terms, the migrant population has increased by almost 120 million since 1990. However, the number of migrants has been strikingly stable in proportion to the world population, hovering at about 3 percent over the past 60 years (De Haas and others 2019). Thus, only a very small fraction of people in the world migrate, one reason being that migration is very costly.

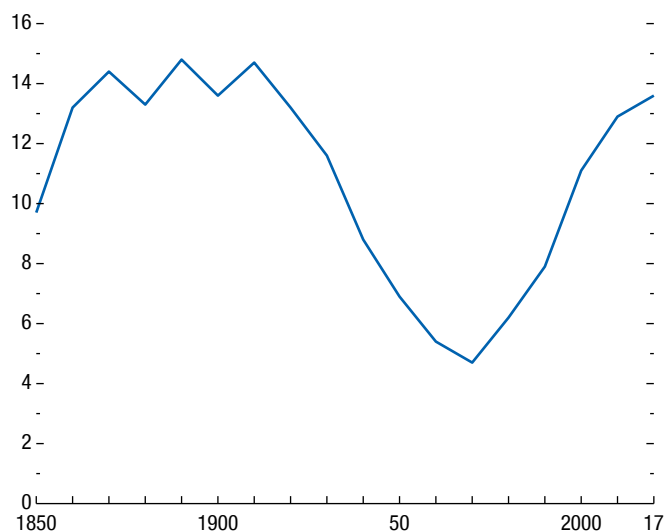
Large episodes of migration toward rich countries—primarily reflecting a search for better economic opportunities—are not new in history and have occurred even when transportation costs were much higher than today (Figure 4.1). Currently, immigrants in advanced economies make up about 12 percent of the population, up from 7 percent in 1990.

Migrants to emerging market and developing economies (EMDEs) constitute only 2 percent of the population and are composed to a significant extent of refugees (Figure 4.2). However, average numbers mask significant heterogeneity, with some EMDEs receiving very large inflows of refugees.<sup>1</sup>

In recent years, migration has taken center stage in the political discourse in many countries, especially advanced economies. Opinion surveys indicate that in main destination countries (for example, Germany, United Kingdom, United States), a majority of the public has a positive view of immigration (Pew Research Center 2019). However, there are also misconceptions and concerns about migration among local populations. A common misconception is that the number of immigrants is twice as high as it is in

<sup>1</sup>The term “refugee” throughout this chapter refers to refugees, asylum seekers, and populations of concern. The category “other populations of concern” refers to individuals who do not necessarily fall directly into other categories (refugees, asylum seekers, internally displaced persons, returned refugees, and returned internally displaced persons), but to whom the United Nations High Commissioner for Refugees extends protection and assistance services, based on humanitarian or other special grounds.

**Figure 4.1. Historical Immigrant Share of the US Population (Percent)**



Sources: US Census Bureau (2006); and Pew Research Center (2019).  
 Note: Immigrants are defined as the foreign-born population. Their share is for the 50 US states and the District of Columbia.

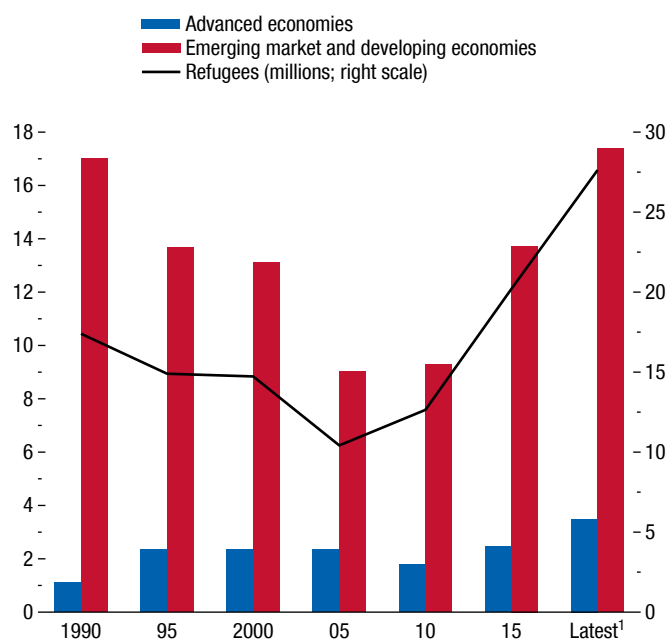
reality (Alesina, Stantcheva, and Miano 2019). Concerns include higher competition for jobs in segments of the local labor market, higher demand for public services, potential strains on public finances, and a perceived threat to the native cultural identity and social cohesion.

Migration raises a vast and multifaceted array of macroeconomic issues. Among them, this chapter addresses the following set of questions:

- How has migration evolved over the past decades? What have been its drivers?
- How will migration flows evolve? How will demographic and income developments affect migration flows?
- What are the macroeconomic effects of migration in destination countries? How do policies shape these effects? What is the impact of migration on the global economy?

The chapter begins by presenting recent trends in migration, differentiating between various types of migrants. It then estimates the drivers of migration. Building on the estimated model of drivers, the chapter presents scenarios for the evolution of global migration, then quantifies the macroeconomic effects of migration using empirical estimations and global model simulations. The empirical analysis looks at the effects of large waves of immigration in

**Figure 4.2. Total and Share of Refugees among All Immigrants (Percent, unless noted otherwise)**



Sources: United Nations; United Nations High Commissioner for Refugees; and IMF staff calculations.  
 Note: The term “refugee” includes refugees, asylum seekers, and populations of concern.  
<sup>1</sup>Refers to the number of refugees in 2018 and to migrants, defined as the foreign-born population in 2019.

destination countries. The model simulations present the potential impact of migration at the global level and in source and destination countries.

The main findings of the chapter are as follows:

- Migration flows are shaped by the evolution of demographics at the origin and by income levels at the origin and destination. Conflicts are important drivers of migration between EMDEs. Migration costs are large.
- Migrants as a share of the global population will remain broadly stable under a baseline scenario. However, continued rapid population growth in EMDEs will mean that migration toward advanced economies will keep rising relative to the size of the native populations, even if higher incomes in the source countries partly attenuate those emigration pressures. Although climate change is expected to increase internal and short-distance migration, its wider implications for international and long-distance migration—such as from EMDEs to advanced economies—is less clear based on existing evidence.

- Large immigration waves raise output and productivity in advanced economies in the short and medium term, pointing to significant dynamic gains for the economy as a whole. Refugee flows into EMDEs do not appear to produce similar rapid gains.
- Active labor market policies, spending on vocational training and adult education, and policies aimed at integrating migrants could boost the macroeconomic gains from immigration. International financial support and policy coordination are needed to address refugee crises and support the integration of refugees in destination countries.
- Migration raises world GDP, in particular by raising productivity. Average per capita incomes of natives increase as their skills are complemented with those of migrants. Remittances from abroad lift income per capita in the origin countries, helping to offset the potentially negative effects of emigration.

The chapter does not consider all aspects of migration, in particular, its distributional effects. Native workers in recipient countries whose skills are complementary to those of immigrants can be expected to gain from the arrival of immigrants, while native workers with similar skills may face stiffer competition in the labor market. Distributional concerns and fears of dete-

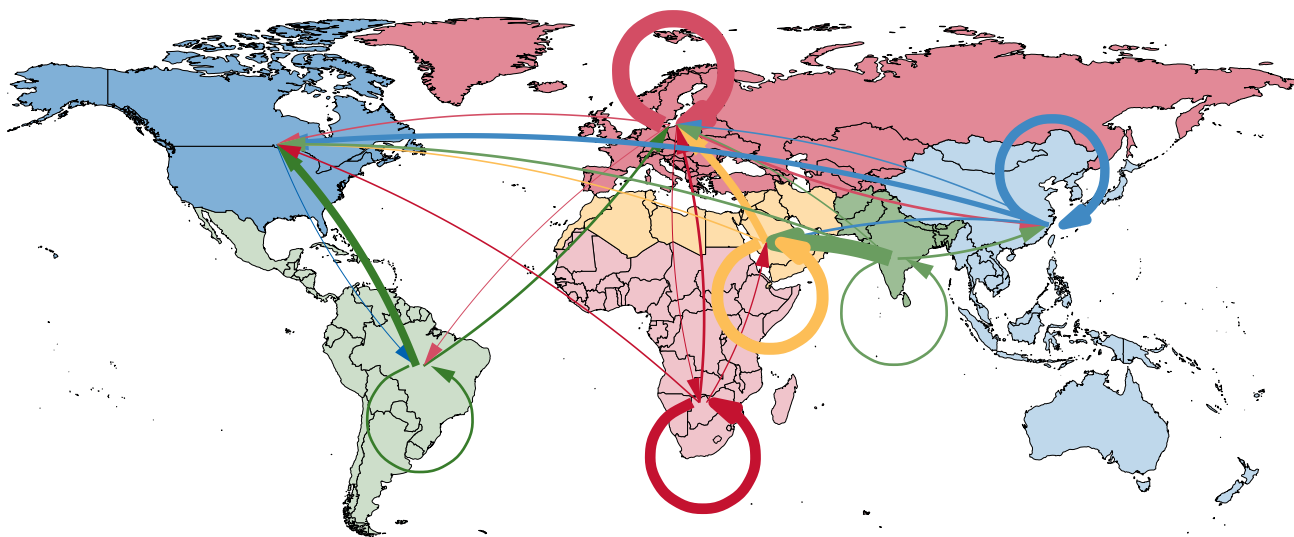
rioration in the provision of public goods may prompt a hostile attitude toward immigration (Halla, Wagner, and Zweimuller 2017). Relative winners and losers will also emerge in source countries. For example, some people in source countries might be at a disadvantage because they could lose services provided by a pool of talented individuals who have decided to emigrate.

While the analysis in this chapter does not address these distributional effects, it nonetheless suggests that average gains from migration are large and, if managed well, potentially have widespread benefits. Policies can help magnify and ensure equitable sharing of these gains. For instance, policies that support education and retraining can both increase the aggregate gains from immigration and facilitate the adjustment of individuals who may face temporary difficulties.

### Stylized Facts

Under the surface of a globally stable share of migrants, migration follows uneven and evolving patterns along migration corridors. Migration occurs largely within broadly defined world regions, such as within Europe and central Asia, where it is less constrained by the higher geographical and cultural barriers that characterize migration across continents (Figure 4.3). Nonetheless, large interregional migration

**Figure 4.3. Migration Flows between 2010 and 2020**



Sources: United Nations; and IMF staff calculations.

Note: Migrants are defined as the foreign-born population in a destination region. For the definition of regions, see Online Annex Table 4.1. This figure shows migration flows larger than 200,000 people between 2010 and 2020. The width of flows is proportional to the number of migrants.

corridors are equally important. Examples include the corridors from Latin America and the Caribbean to North America, from South Asia to the Middle East, and from the Middle East and North Africa to Europe.

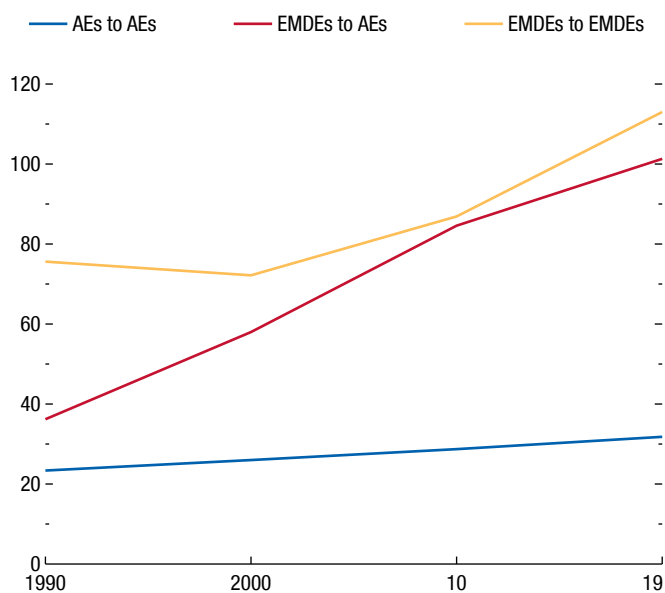
Migration from EMDEs toward advanced economies has increased significantly over the past several decades. Figure 4.4 shows that, in absolute terms, migration from EMDEs to advanced economies has now reached almost the same level as migration between EMDEs. Between 1990 and 2019 the share of migrants from EMDEs to advanced economies rose from 4 percent to 9 percent of the advanced economy population, while EMDE-to-EMDE migration remained stable at about 2 percent of the EMDE population. Given the small and falling share of the world population residing in advanced economies, the large increase in the share of immigrants in those countries corresponds to just a one-half percentage point increase in the world share of migrants, which currently stands at 3.5 percent.

Income and demographic developments are associated with migration in general and with the rise in migration from EMDEs to advanced economies in particular. On the income side, two aspects are key to understanding the effect of income on

migration: relative income gaps and absolute levels of poverty. Per capita GDP in advanced economies is still almost five times as large as in EMDEs, creating a significant pull effect on immigration. However, growth in EMDEs, especially China and India, has significantly reduced this gap over recent decades and will further reduce it in the future under a baseline scenario (Figure 4.5).

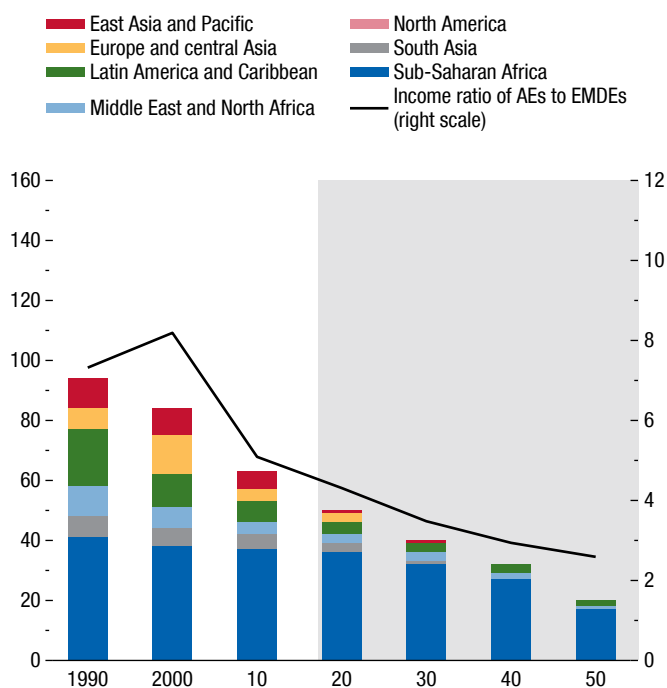
The number of countries with annual income per capita below \$7,000 (in 2011 international dollars) has declined dramatically. Sub-Saharan Africa is one exception to this trend—the number of countries there with low per capita incomes is still significant and, though decreasing, could remain high in the coming decades. It is often assumed that higher average income in a country leads to less emigration. While this is true in many cases, it is nonetheless not always correct. Some individuals are too poor to emigrate, and poverty

**Figure 4.4. Stock of Migrants, by Corridors**  
(Millions)



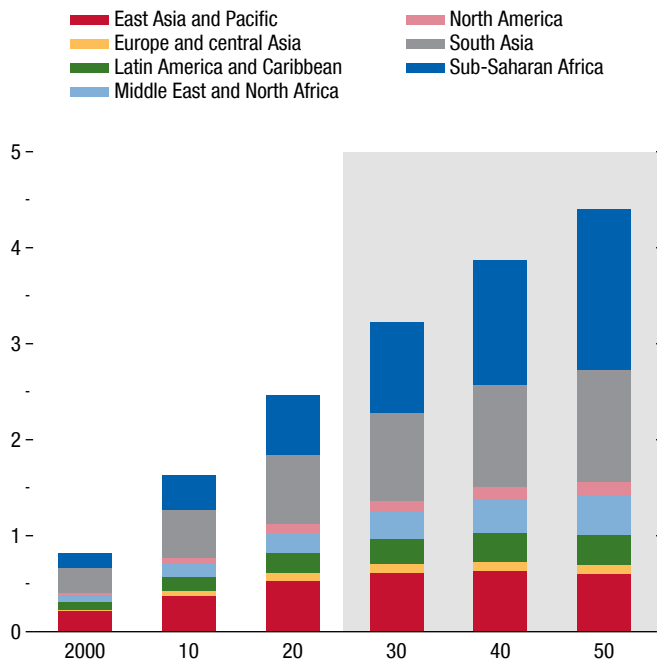
Sources: United Nations; and IMF staff calculations.  
Note: Migrants are defined as the foreign-born population. AEs = advanced economies; EMDEs = emerging market and developing economies.

**Figure 4.5. Real GDP per Capita below \$7,000 and Income Gaps**  
(Number of countries)



Sources: Penn World Tables (PWT 9.1); and IMF staff estimates.  
Note: The figure shows the number of countries with a real GDP per capita below \$7,000 measured in 2011 chained purchasing power parity terms (left scale). The income gap is measured as the ratio of the population-weighted average of advanced economies (AEs) and emerging market and developing economies (EMDEs). For the definition of regions, see Online Annex 4.1. The shaded area shows projections based on the baseline scenario in the section of this chapter on future migration pressures.

**Figure 4.6. Cumulative Population Change, by Region Relative to 1990 (Billions)**



Sources: United Nations; and IMF staff calculations.

Note: For the definition of regions, see Online Annex 4.1. The shaded area shows United Nations projections.

can trap them in their home country. The next section of this chapter provides empirical evidence that, below a threshold of \$7,000, an increase in income provides individuals with the means to emigrate toward advanced economies.

Demographic changes are uneven across regions (Figure 4.6). The population in advanced economies has stabilized and in some cases is projected to decline (IMF 2019). By contrast, the population in EMDEs will continue to rise, especially in South Asia, North Africa and the Middle East, Latin America, and most of all, sub-Saharan Africa. These trends will raise the number of potential migrants from EMDEs to advanced economies. Countries with fast-growing populations may face challenges in creating enough well-paying jobs for a young and growing workforce, while countries with aging and shrinking populations may face labor shortages.

Conflict is another important driver of migration, and it leads people to seek refuge in other countries. Refugees leave their home under sudden and dire conditions triggered by the eruption of conflict or

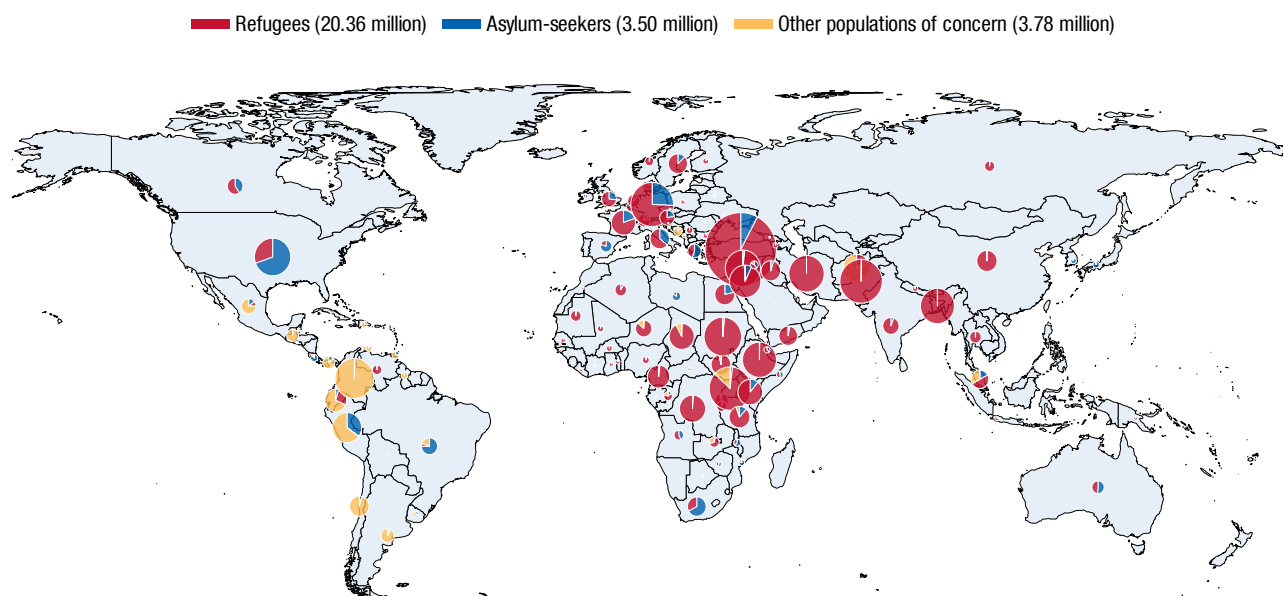
wars, which occur mostly in EMDEs. In recent periods, large cumulative inflows of refugees, amounting to more than 1 percent of the destination countries' population, have been observed in Germany and Turkey. Extreme cases—those featuring immigration well above 4 percent of the recipient countries' population—have occurred in Colombia (after the Venezuelan crisis) and in Jordan and Lebanon (resulting from the conflict in Syria). Because refugees are often poor and rarely have time to plan their emigration, they tend to travel shorter distances and remain in their home region more often than other migrants (Figure 4.7).

The differences in the conditions underlying the migration decisions of refugees—legal status, ability to choose their geographical relocation, and relative access to formal labor markets—all suggest that the impact of refugees on receiving countries could differ significantly from that of other types of migrants.

Immigration policies also influence the level and composition of migration. Immigration policies at the global level have generally become less restrictive since the end of World War II, although this liberalization trend appears to have slowed more recently, and reversed in some cases (De Haas and others 2019). Liberalization trends are clearly visible in the evolution of policies that regulate the entry and integration of immigrants, while policies concerning internal and border controls have tightened over time (Figure 4.8). Migration policies also attempt to affect the composition of the immigrant pools—for example, policies targeting high-skilled individuals have become common in the past two decades (De Haas, Natter, and Vezzoli 2014). Indeed, migrants from poor to rich countries are usually more educated than the average population in the origin country (Grogger and Hanson 2011). The effectiveness of migration policies in regulating migration flows is the subject of substantial debate in the economic literature (see De Haas and others 2019 for an overview).

### The Drivers of Migration

This section looks more systematically at the drivers of international migration using a standard gravity model. The model is based on the idea that migration is a choice that individuals make by weighing the costs and benefits of staying home versus moving to different destination countries (Beine, Bertoli, and Fernández-Huertas Moraga 2016).

**Figure 4.7. Refugee Stocks at the End of 2018**

Source: United Nations High Commissioner for Refugees.

Note: The category “other populations of concern” refers to stateless persons plus individuals who do not necessarily fall directly into other categories (refugees, asylum seekers, internally displaced persons, returned refugees, and returned internally displaced persons), but to whom the United Nations High Commissioner for Refugees extends protection and assistance services, based on humanitarian or other special grounds.

The benefits to the migrant include a potential wage gain from moving to a richer country. The younger the migrant, the larger these gains because younger migrants have a longer lifetime ahead of them in which to benefit from the extra income. Other possible benefits include escaping a conflict, finding a more generous welfare system abroad, or resorting to migration as a way of adapting to climate change. The costs of migration include overcoming geographical, cultural, and linguistic barriers. In addition, immigration policy restrictions, such as visa requirements and limitations on the right to work, could be significant costs. Destination countries may also create preferential immigration pathways from former colonies, while networks of existing migrants from the same source country, and especially family members, can help new immigrants adjust and provide resources in advance to pay for travel costs.

### Baseline Drivers

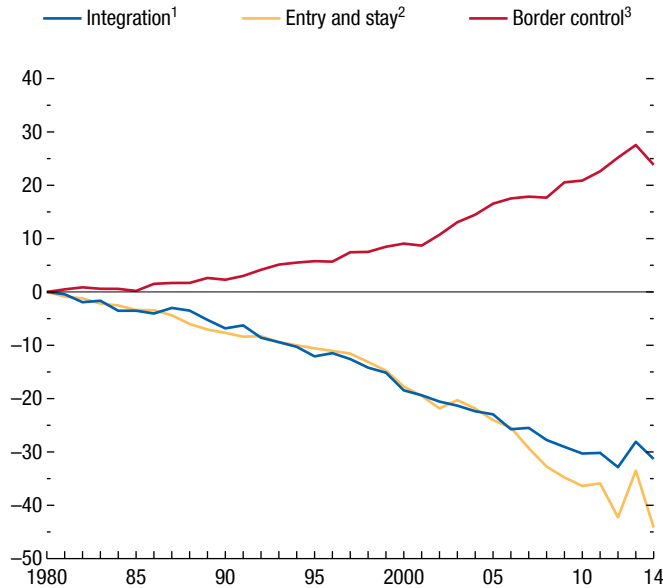
Modeling the number of migrants starts from a simple baseline specification that contains the most important drivers and then adds various extensions

(see Online Annex 4.2 for a detailed description of the drivers considered; All annexes are available at [www.imf.org/en/Publications/WEO](http://www.imf.org/en/Publications/WEO)). The number of migrants is obtained from the bilateral migrant stock statistics published by the United Nations Department of Economic and Social Affairs. The data provide the number of international migrants for every origin and destination country pair in the world every five years from 1990 to 2015. The analysis follows the literature that derives net migration flows from the stock data (see Beine, Bertoli, and Fernández-Huertas Moraga 2016 for a review).<sup>2</sup>

The estimated coefficients capture the importance of the different drivers in a typical migration episode. The estimation is carried out both on the entire sample of countries and by splitting the sample into the three main migration corridors depicted in Figure 4.4 (EMDEs to EMDEs, EMDEs to advanced economies, and advanced economies to advanced economies). Figures 4.9 summarizes the contribution of the baseline migration drivers to explaining observed migration

<sup>2</sup>Migration flows defined in this way do not capture some aspects of migration, including seasonal migration. The definition of migrants adopted in this chapter also excludes from the analysis issues related to second-generation immigrants.

Figure 4.8. Restrictiveness of Migration Policies

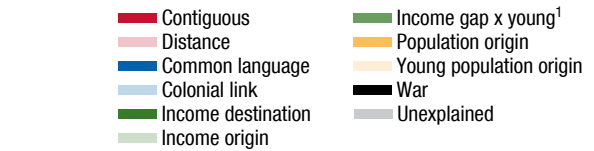


Sources: Determinants of International Migration dataset; and IMF staff calculations.  
 Note: The indexes are normalized to zero in 1980. Positive (tightening) and negative (loosening) policy changes are cumulated over time and summed across countries. Depending on their intensity, individual policy changes range between -4 and +4. Missing values are treated as no change (zero).  
<sup>1</sup>The index measures postentry rights and other aspects of integration of a target group.  
<sup>2</sup>The index covers issues related to entry and stay permits and regularizations.  
<sup>3</sup>The index measures the external and internal border controls that aim to secure national territories through surveillance, detention, and sanctions of fraudulent acts.

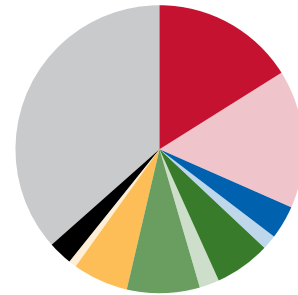
flows for the two most relevant migration corridors (EMDEs to EMDEs and EMDEs to advanced economies). The main conclusions are as follows:

- *Migration is difficult and costly.* More than half of the explained variation of migration flows can be attributed to the effect of geographical and cultural barriers. Distance and (lack of) border contiguity between two countries are significant impediments to bilateral migration flows. The lack of a common language or a former colonial link also add important cultural and political barriers to migration.
- *Demography in origin countries matters.* Larger populations in origin countries lead to more emigrants. Holding the population size constant, people in younger societies, on average, do not seem to emigrate more, but they do emigrate more to countries where the income gap is larger.
- *Conflicts are important for EMDE migration.* More intense conflicts drive more emigration, especially toward other EMDEs, although the effect appears to be temporary.

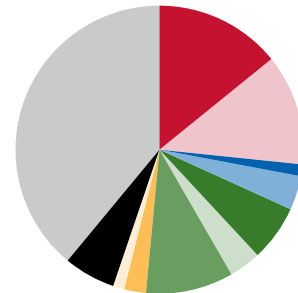
Figure 4.9. Explained and Unexplained Shares of the Variation in Migration



1. From EMDEs to AEs



2. From EMDEs to EMDEs



Source: IMF staff calculations.  
 Note: The figure shows the increase in R-squared with the inclusion of each variable, under all possible model combinations, following the hierarchical partitioning method of Chevan and Sutherland (1991). Fixed effects are partialled out before applying the method. AEs = advanced economies; EMDEs = emerging markets and developing economies.  
<sup>1</sup>Denotes the product between the income gap and the share of young population.

- *Refugees are a much more important component of immigration into EMDEs*, consistent with the evidence on conflict (see the section in this chapter on the impact of large immigration waves).<sup>3</sup>
- *Migrants respond to income levels.* In addition to the interacted effect of income gaps already discussed,

<sup>3</sup>This is in addition to the impact of war in causing a collapse in average income. For more on the role of war and violence in driving emigration, see Beine and Parsons (2015). The effects of war are visible over 5 years but not over 10 years or longer, which suggests that war-related emigration is temporary. Possible explanations include the following: (1) Some migrants return to their home country once the conflict has ended, and (2) Part of the migration after conflicts that are not of extreme intensity reflects the anticipation of emigration decisions that would have occurred anyway later.

the level of both per capita income at origin and at destination matter on their own. The role of income at origin is more complex than a simple push narrative would suggest, as discussed below.

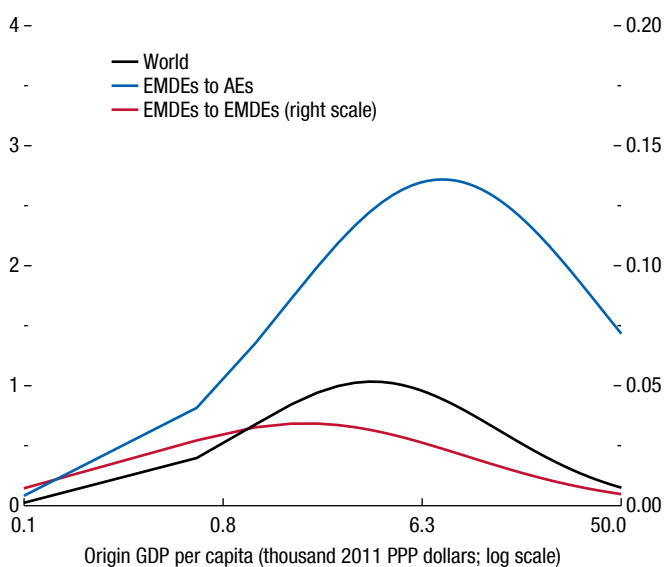
The black line in Figure 4.10 depicts emigration rates toward an average country as a function of the origin country’s per capita income. The blue and red lines indicate what the emigration rate would be toward advanced economies and EMDEs, respectively, if migration costs and other drivers were set equal to the world average. The pull effect of income in destination countries on immigration is evident from the fact that the line for the corridor toward advanced economies is orders of magnitudes higher than the line toward EMDE destinations. In other words, if migration costs to advanced economies were the same as those toward EMDEs, then virtually all world migration would be directed toward advanced economies.

Although higher income at destination always increases immigration, it is not necessarily the case that higher income at the origin decreases emigration. Figure 4.10 shows that, for countries at very low levels of per capita income, a marginal rise in

income *increases* the emigration rate. This indicates the presence of “poverty traps” that prevent people who are very poor from being able to afford to emigrate.<sup>4</sup> For income levels beyond a certain threshold, a further increase in income instead leads to less emigration. Interestingly, in emigration toward other EMDEs, the threshold—of about \$2,000—is significantly lower than in emigration toward advanced economies, for which the threshold is about \$7,000. This property gives rise to an important effect that shapes the evolution of emigration corridors: economic growth in countries with income between \$2,000 and \$7,000 has the effect of reducing emigration toward EMDEs while increasing it toward advanced economies.

The results indicate that both population and economic growth in EMDEs drove the rise of migration from EMDEs to advanced economies between 1990 and 2015 (Figure 4.11). In 1990 there were many countries with initial per capita income below the poverty trap threshold of \$7,000 (Figure 4.5). Economic growth in these origin countries thus provided a larger number of individuals with the means to migrate to advanced economies. At the same time, given that many cases income per capita was already above \$2000, economic growth reduced emigration to other EMDEs.

**Figure 4.10. Income at Origin and Destination and Probability of Emigrating**  
(Five-year emigration rate; percent)



Source: IMF staff calculations.

Note: The figure shows the partial relationship implied by the baseline estimation, holding other factors constant. The average world emigration flow is equal to 0.5 percent of origin population. AEs = advanced economies; EMDEs = emerging market and developing economies; PPP = purchasing power parity.

### Additional Drivers

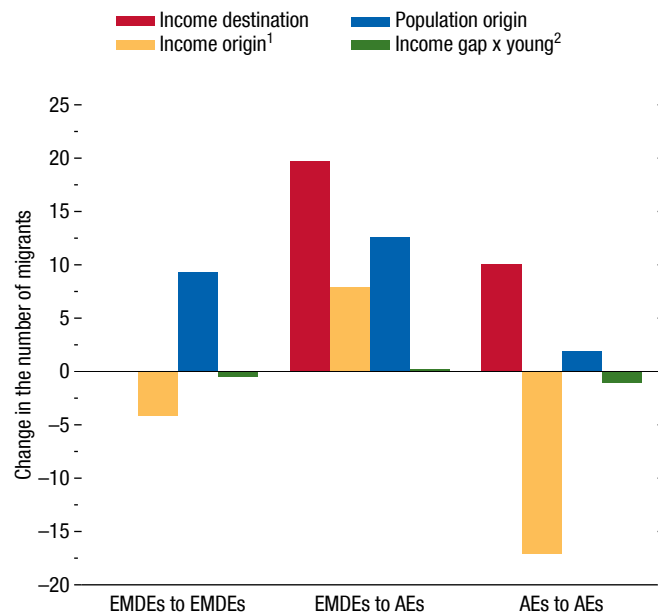
The inclusion in the baseline regression of other potential drivers suggests the following:

- A previous stock of migrants from the same origin country significantly increases migration due to network effects (see also Munshi 2003; and Beine, Docquier, and Ozden 2011).
- In Organisation for Economic Co-operation and Development (OECD) countries, tighter immigration policies on entry requirements and fewer

<sup>4</sup>The poverty trap effects are captured by adding to the regression model the square of log income per capita at origin. To exploit the cross-sectional variation that allows the identification of poverty traps, origin fixed effects are not included in the gravity estimation. Poor people may not have enough savings to pay transportation costs and support themselves and their families until a job is found in the destination countries. Borrowing constraints limit the ability of migrants to finance their emigration enterprise through debt. In addition, poorer people usually have lower levels of education, making it more difficult for them to emigrate toward countries whose immigration policies prioritize the attraction of high-skilled migrants (Clemens 2014; Bazzi 2017).



**Figure 4.11. Decomposition of Past Migration Flows, 1990–2015**  
(Millions)



Source: IMF staff calculations.

Note: Derivation of the decomposition appears in Online Annex 4.2. AEs = advanced economies, EMDEs = emerging market and developing economies.

<sup>1</sup>Includes the poverty trap effect of origin income.

<sup>2</sup>Denotes the product between the income gap and the share of young population.

integration measures are associated with reduced immigration.<sup>5</sup>

- Climate change affects international migration through its impact on income levels (see Chapter 3 of the October 2017 *World Economic Outlook* (WEO)). Natural disasters, particularly extreme temperatures and storms, have additional effects that lead to a further but small increase in emigration.
- Currency crises are associated with more emigration beyond their effects on income, but the evidence for banking and debt crises is less clear. This is likely due to the fact that banking crises are more frequent in advanced economies, where

<sup>5</sup>The estimated coefficients suggest that the secular relaxation of entry requirements over the past three decades is consistent with an increase in net immigration flows of about 35 percent. It is important to emphasize that these results point mostly to correlation rather than patterns of causation because policies could be endogenous to migration flows (in this case, the actual effect of policies would likely be even larger). These calculations also ignore other effects of immigration policies (De Haas and others 2019).

emigration is typically smaller. In contrast, currency crises are more frequent in EMDEs.

- There is no evidence for the idea of “welfare shopping” by international migrants if the destination country’s government spending is used as a proxy.

The gravity model used in this section explains more than 50 percent of variation in migration flows. However, while it does a good job of capturing the drivers of gradual migration flows, including those triggered by non-extreme conflicts, it is less successful in precisely fitting the magnitude of extreme migration events, such as those associated with economic collapses or destructive wars.

### Composition of Migration

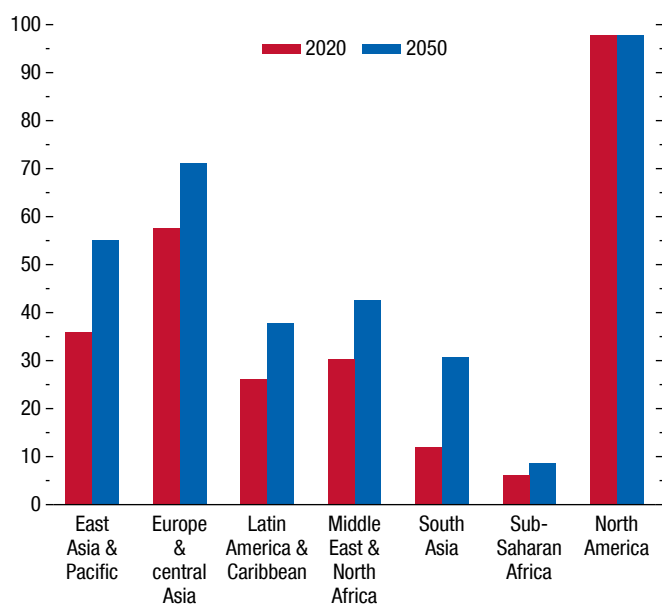
To complement the analysis of the drivers of total migration, this chapter builds on World Bank (2018) and considers which drivers change the skill composition of the pool of migrants. The evidence shows that destination countries where the skill premium is higher attract a relatively more educated group of immigrants. Conversely, origin countries with a relatively lower skill premium feature an emigrant population that is relatively more skilled than the native one. Moreover, most drivers that are associated with lower bilateral migration costs (for example, a common border, a diaspora network in the destination country, and shorter distances) tilt migration toward the lower skilled, consistent with the idea that travel costs are more binding for these workers. However, a common language increases high-skilled immigration, likely because communication abilities are relatively more important in high-skill jobs (Grogger and Hanson 2011; Belot and Hatton 2012).

### Future Migration Pressures

Drawing on the estimate of the historical drivers of migration, this section provides three migration scenarios for the period 2020–50. The scenarios provide a general indication of the likely direction and intensity of long-term migration pressures rather than a prediction of future migration. Indeed, future migration is subject to large uncertainties, including those stemming from the difficulty of anticipating the long-term evolution of countries’ income levels.

Each of the three scenarios is based on the set of drivers from the baseline regression in the previous section of this chapter. In order to focus on long-term

**Figure 4.12. Current and Projected Real GDP Per Capita, by Region**  
(Share of US GDP per capita)



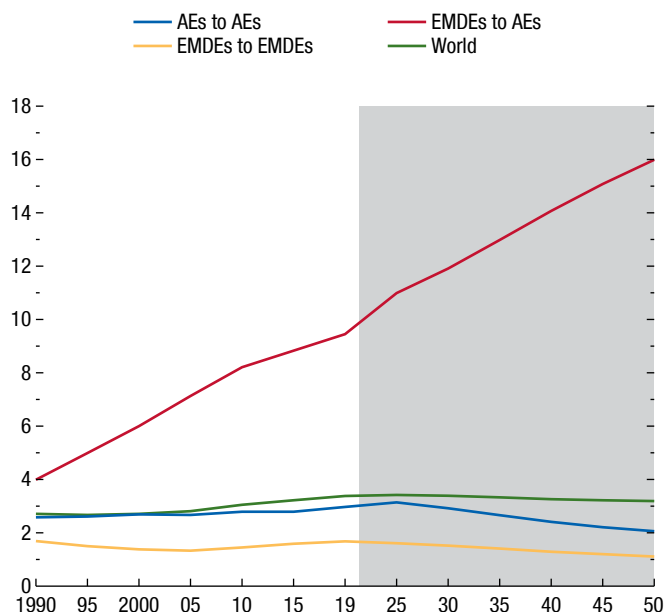
Sources: Penn World Tables (PWT 9.1); and IMF staff estimates.

effects of drivers, the model is first reestimated using bilateral migration stocks (see Online Annex 4.2). The estimated coefficients are then applied to future values of the migration drivers defined by the three scenarios. The scenarios, which differ from each other on the basis of different assumptions for the evolution of income per capita, are as follows:<sup>6</sup>

- **Baseline scenario.** Starting in 2019 real GDP per capita in the United States is assumed to keep growing at a constant rate of 1.6 percent a year (the average growth over the past decade). All other countries are assumed to follow a convergence path to the United States (Figure 4.12), as determined by country-specific convergence rates estimated in Chapter 3 of the October 2019 WEO for 2008–17.
- **Higher growth in EMDE scenario.** Per capita growth in each EMDE country is assumed to be 1 percentage point higher a year.
- **Climate change scenario.** Warming temperatures, under “High Emission” Scenario 8.5 of the Intergovernmental Panel on Climate Change (IPCC),

<sup>6</sup>Beyond income variables, other variables that could increase or decrease future migration pressures include changes in migration policies, the intensity of conflicts, and transportation costs.

**Figure 4.13. Migration Corridors**  
(Percent of total population in destination group)



Sources: United Nations; and IMF staff estimates.

Note: Migrants are defined as foreign-born population. The shaded area shows United Nations projections. AEs = advanced economies; EMDEs = emerging market and developing economies.

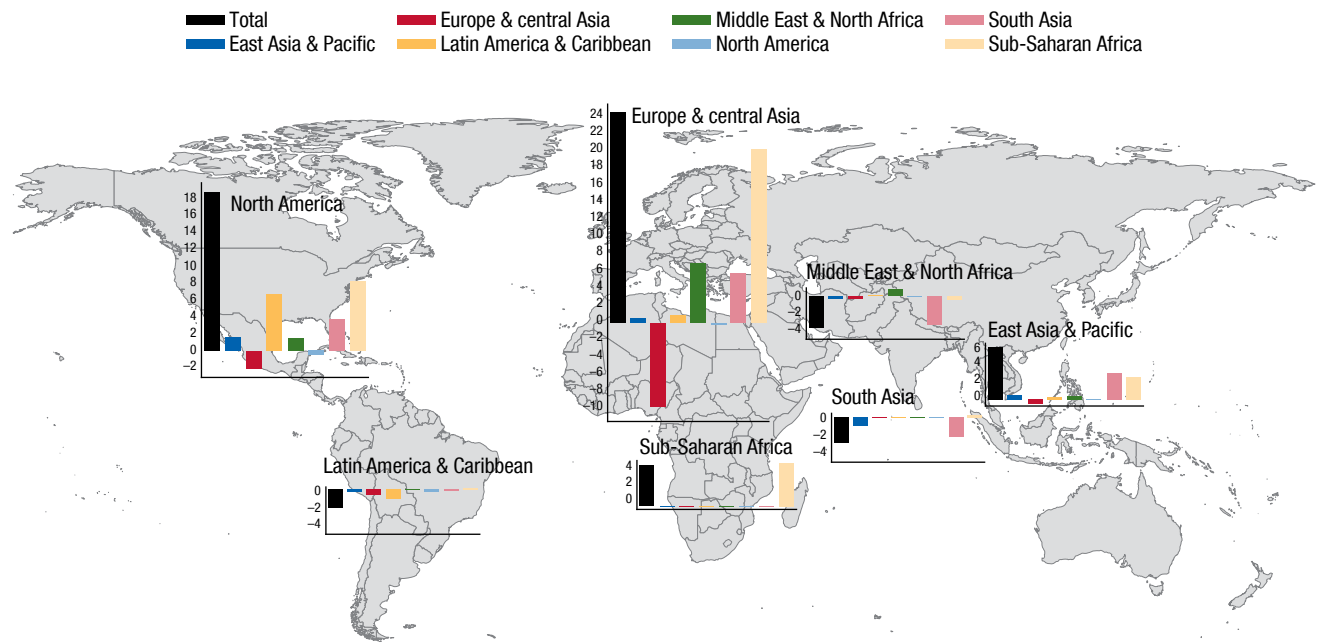
are assumed to affect per capita GDP according to the nonlinear relationship estimated in the October 2017 WEO. Therefore, this scenario explores the effect of climate change on migration through the income channel.

In terms of common assumptions, geographic and linguistic variables are kept constant in all scenarios, and demographic variables evolve according to United Nations population projections.

### Baseline Scenario

Under the baseline scenario, the world migrant share between 2020 and 2050 is nearly stable, at just above 3 percent of the world population (Figure 4.13). Therefore, at the global level, there is no surge in migration. However, the share of EMDE immigrants into advanced economies keeps increasing to about 16 percent of the total population of advanced economies, despite the negative effect that income convergence has on EMDE emigration. The increase is driven by the rise in the absolute number of immigrants (a numerator

**Figure 4.14. Change in Migrant Pressures Between 2020 and 2050, Baseline Scenario**  
(Millions of individuals)



Sources: United Nations; and IMF staff estimates.

effect) caused by growing population in EMDEs. Population aging and the decline of the native population also contribute to the increase in the immigrant share (denominator effect). However, rising population in EMDEs and emigration patterns that continue to shift toward advanced economies cause a fall in the immigrant share in the population of EMDEs.

Figure 4.14 provides more details by presenting absolute changes in migration pressures (expressed in millions of individuals) between 2020 and 2050, disaggregated into broad world regions. A few patterns stand out:

- Migration pressures build up from Africa and the Middle East to Europe. This is largely caused by a population boom in sub-Saharan Africa, where the population would increase by 1 billion between 2020 and 2050, generating out-regional migration pressure of 31 million individuals.<sup>7</sup> In addition, economic

growth in sub-Saharan Africa increases emigration from the region toward advanced economies in Europe. This is attributable to the significant number of countries in the region that in 2020 still feature income per capita levels below the poverty trap threshold of \$7,000.

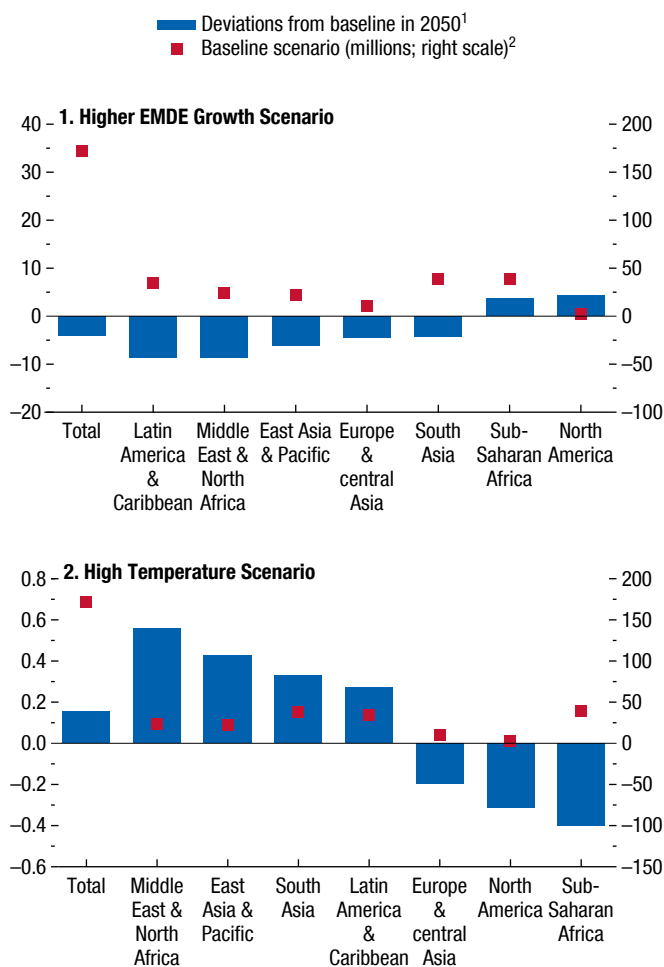
- Migration pressures within Europe and central Asia fall, caused by a combination of higher income per capita and falling population in the group of emerging market economies within the region.
- Immigration pressure from south into the Middle East falls because of south Asia's continuing process of income convergence.
- A growing population in Latin America and the Caribbean exerts continuing pressure on immigration to North America, although with less intensity than in the past.

### Alternative Scenarios

Fostering higher growth and more job opportunities in EMDEs is often heralded as a way to enable migrants to stay in their home countries and thereby reduce migration pressure in advanced economies.

<sup>7</sup>Under the baseline scenario, the emigration rate in sub-Saharan Africa increases from 0.7 percent to just below 2 percent. These figures are in line with Gonzales-Garcia and others (2016). That study, which does not account for poverty trap effects, projects an increase in migration from sub-Saharan Africa to OECD countries of 28 million people between 2013 and 2050.

**Figure 4.15. Alternative Migration Scenarios**  
(Percent, unless noted elsewhere)



Sources: United Nations; and IMF staff estimates.

Note: EMDE = emerging market and developing economy.

<sup>1</sup>Bars represent percentage deviations in 2050 relative to the baseline scenario.

<sup>2</sup>Squares represent out-regional migration pressures (stocks) in 2050 under the baseline scenario.

The next scenario, depicted in panel 1 of Figure 4.15, examines the impact on out-regional migration of an additional 1 percentage point of annual growth in each EMDE. The panel shows both the baseline scenario (right scale) and the change in migration stocks relative to the baseline scenario (left scale). Migration pressures fall in all emigration-prone regions, including from Africa and the Middle East taken as a whole. The only exception is sub-Saharan Africa, where emigration pressure increases marginally because the higher growth alleviates poverty traps, which are still present in many countries. Given that sub-Saharan Africa is also the

region that, under the baseline, provides the single biggest contribution to the increase in future migration pressure, it follows that higher growth in EMDEs does reduce migration overall, but the total effect is not very large.

The third scenario examines the impact of climate change on future migration. Overall, emigration pressures over the next three decades stemming from climate change are modest.<sup>8</sup> Panel 2 of Figure 4.15 shows that climate change adds to emigration pressures for all typical emigration regions except sub-Saharan Africa. There, the additional warming has particularly negative effects on income, worsening the poverty trap and reducing out-regional migration pressures.

Although lower growth or higher temperatures cause a small reduction in out-regional migration pressures from sub-Saharan Africa, their interaction with the poverty trap increases intraregional migration pressures. This conclusion is in line with the climate change literature that finds a significant increase in internal and short-distance migration as a result of climate-related events (Rigaud and others 2018). More generally, the literature on the effects of climate change and natural disasters on international migration is not settled. Some studies find that climate change increases international migration, but a significant number of studies do not find any impact. The apparently conflicting results can be attributed to different research methodologies and to the fact that the response of migration to climate change is context-specific and thus differs across countries (Beine and Jeusette 2018). There are still substantial gaps in the literature about the future effect of climatic events on emigration (Cattaneo and others 2019).

One circumstance that appears relatively established is that climatic developments can trap individuals and *reduce* emigration (Beine and Parsons 2017; Peri and Sasahara 2019). The literature also indicates that fast-onset disaster events, such as floods or hurricanes, lead to migration that occurs over short distances and only temporarily because the displaced individuals return to the disaster zones quickly (see Cattaneo and others 2019 for a survey). However, studies have

<sup>8</sup>There are two reasons for this modest result. First, the scenario ends in 2050, when the increase in temperature is still relatively modest. Second, the presence of poverty traps in hot regions reduces out-regional migration. There are significant uncertainties in the estimate of the impact of climate change on migration, given the lack of historical precedents for a global phenomenon of this type.

necessarily relied on historical estimates. Warming under the “high-emission” scenario would lead to temperatures that have not been experienced for a very long time, so it is hard to know how migration might react under such a scenario.

## The Impact of Large Immigration Waves

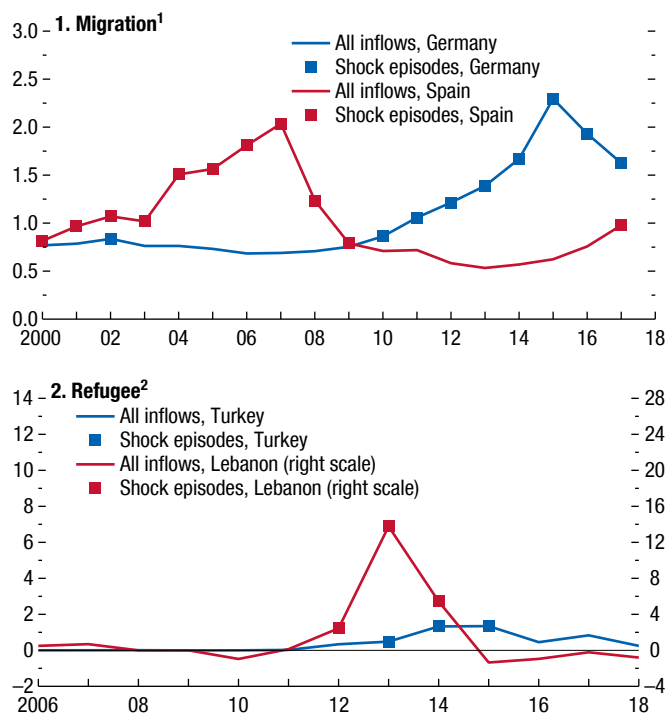
The economic impact of migrants on destination countries is estimated based on a data set of large immigration episodes. Examining large waves of migration is of interest because they are more likely to be politically difficult and can test the absorption limit of recipient economies.<sup>9</sup> Most of the impact analysis is performed for migration to advanced economies because of the requirement for annual data. A second exercise also examines the impact of large waves of refugees into EMDEs. The estimation strategy follows three steps for both parts of the analysis, as follows:

- The first step is the selection of immigration episodes. A large episode is characterized by an immigration flow that meets certain minimum size thresholds relative to the recipient country’s population. In turn, the thresholds are defined in ways that guarantee that the episode is large, both relative to the country’s historical immigration experience, and from the perspective of typical episodes at the world level.<sup>10</sup> Panel 1 of Figure 4.16 presents two episodes of large immigration waves into advanced economies, Germany and Spain (the squares on the lines indicate the inflows identified as “large shock”). Panel 2 of Figure 4.16 depicts cases of refugee immigration into EMDEs for Lebanon and Turkey. Refugee inflows into Turkey

<sup>9</sup>In addition, difficult conditions in source countries are more likely to trigger sudden migration surges than strong economic growth in the destination country, helping to disentangle the effect of migrants on the economy of recipient countries.

<sup>10</sup>For migration shocks into advanced economies, an episode is large if the annual inflow (as a share of population) is greater than the country’s median inflow during 1980–2018 and is also greater than the median inflow (relative to the recipient country’s population) experienced by OECD countries during the previous five-year period and the following five-year period. Refugee shocks are instead defined as an inflow (as a share of population) that is within the country’s top 10th percentile of inflows during 1980–2018 and is also greater than the top 10th percentile (relative to the recipient country’s population) experienced by all countries in the world during the previous five-year period and the following five-year period. Finally, to avoid including episodes characterized by sudden reversals, the refugee inflow shock must be sustained for at least two consecutive years.

**Figure 4.16. Episodes of Large Immigration Inflows**  
(Percent of recipient countries’ population)



Sources: Organisation for Economic Co-operation and Development; United Nations High Commissioner for Refugees (UNHCR); IMF World Economic Outlook database; and IMF staff estimates.

<sup>1</sup>Migrants are defined as foreign-born or foreigners, along with acquisition of nationality. Inflows are in gross terms.

<sup>2</sup>Refugees are defined as individuals categorized as either “refugees,” “asylum seekers,” or “other” by the UNHCR. Inflows are defined as the annual change in stocks due to data constraints.

peaked at just above 1 percent of the country’s population, an example of a typical large episode, on which the estimation focuses. However, there is significant variation within the category of large refugee episodes. Episodes, such as the one in Lebanon, during which inflows reached 15 percent of the domestic population, belong to the top 1 percent of distribution of events and can thus be considered extreme.

- The second step aims to solve a reverse-causality problem, in which good economic conditions may cause large immigration inflows (Card 2001; Peri and Sparber 2009). To address this issue, an instrumental variable is constructed that is independent of economic conditions in the recipient country. The construction exploits two properties of migration patterns: migrants choose their destination partly

based on the presence of networks of past migrants, and refugees locate close to their country of origin (see the previous section of this chapter on the drivers of migration).

- The final step is the choice of the estimation model. A local projection framework (Jordà 2005) provides a convenient way to trace the response of macroeconomic variables to the (instrumented) immigration shocks over time. The model controls for country-specific characteristics that are constant over time and for time-varying components that are common across countries. Further checks are conducted to ensure that the estimations are robust to the inclusion of additional controls (see Online Annex 4.3 for details).

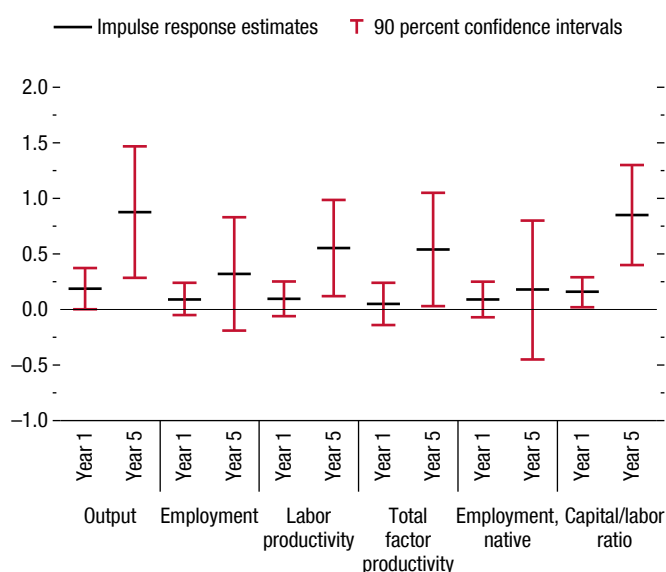
### The Effects of Immigration in Advanced Economies

Figure 4.17 presents the responses of various macroeconomic aggregates in the recipient country in the first and fifth year after the immigration shock. The size of the effect indicates the variable's response to a 1 percentage point increase in the ratio of the immigrant flow relative to (the lag of) total employment.

Output increases by almost 1 percent by the fifth year. About two-thirds of this increase is attributed to an increase in labor productivity and the remaining one-third to employment growth (which is borderline insignificant, however). An increase in total factor productivity (TFP) matches the rise in labor productivity. As the capital stock responds immediately to the higher employment and TFP, the capital-labor ratio rises. When breaking down total employment growth into its components, the analysis does not detect any effect on the aggregate growth rate of native employment (see Online Annex 4.3 for additional results).

The positive impact of immigration on productivity in recipient economies is a key empirical finding of studies on immigration (Peri 2011b; Ortega and Peri 2014; Alesina, Harnoss, and Rapoport 2015; Jaumotte, Koloskova, and Saxena 2016). The literature emphasizes that these results can be attributed to the complementarity between native and immigrant workers (see Chapter 4 of the October 2016 WEO). As immigrants enter the labor market, natives move to new occupations, which, in many cases, require proficient linguistic and communication abilities or the performance of more complex tasks. Thus, as immigrants move into occupations that are in short supply, natives upgrade their skills, leading to economy-wide

**Figure 4.17. Macroeconomic Effects of Migrant Inflows in Advanced Economies**  
(Percent)



Source: IMF staff estimates.  
 Note: This figure depicts the effect of a 1 percent increase in the migration inflow to the employment ratio in the destination country on the macroeconomic variables indicated, estimated based on a sample of Organisation for Economic Co-operation and Development countries from 1980–2018 using the local projections method of Jordà (2005). Year 0 is the year before the shock, and year 1 shows the effect of the shock on impact. See Online Annex 4.3 for details of the model specification.

gains from specialization.<sup>11</sup> For similar reasons, most of the literature finds a very limited effect of migration on average wages or employment of native workers. Box 4.1 illustrates the potential labor market effects of complementarity between immigrants and natives in the context of growing automation.

Most of the literature that investigates the productivity impact of immigrants studies long-term effects. The question arises whether the aggregate effect of immigration could be less positive when looking at the short term or at large migration episodes, such as those considered here. The concern is reasonable and motivated by the presence of various economic frictions, including slow adjustments in the labor market and in the capital stock. The results in Figure 4.17 suggest that aggregate gains from immigration materialize

<sup>11</sup>See Peri and Sparber (2009); Hunt and Gauthier-Loiselle (2010); Farré, González, and Ortega (2011); D’Amuri and Peri (2014); Ortega and Peri (2014); Alesina, Harnoss, and Rapoport (2015); Cattaneo, Fiorio, and Peri (2015); Peri, Shih, and Sparber (2015a; 2015b); Aiyar and others (2016); and Jaumotte, Koloskova, and Saxena (2016).

very quickly, even with potentially disruptive inflows. Overall, the immediate response of labor productivity points to the existence of significant dynamic gains from immigration, even in the short term.<sup>12</sup>

The estimated positive macroeconomic effects of immigration in advanced economies are large. Even though data limitations confine the analysis to immigration into advanced economies, other studies that have concentrated on long-term effects (Ortega and Peri 2014) also find a large and positive impact of immigration on income per capita in a broad sample, including EMDEs. However, some caveats should be considered when interpreting the estimated positive effects of immigration. First, although the instrumental variables approach should, in principle, guard against reverse causality issues, this strategy may not work perfectly. The residual presence of reverse causality would likely imply that the positive effects of immigration would be smaller. Second, the increase in the heterogeneity of a society due to immigration may reduce support for the provision of public goods, such as education (Alesina, Baqir, and Easterly 1999; Speciale 2012). Third, in line with previous studies (Åslund and Rooth 2007), this chapter also finds some evidence that aggregate gains could be smaller in the presence of higher initial unemployment in the destination country.

Finally, positive average effects may hide, at a more disaggregated level, the existence of some losers from immigration, especially in the short term. While the large aggregate positive effects presented in this section may suggest that negative effects are limited, a vast literature uses micro data to study the distributional consequences of immigration. Box 4.1 presents a general survey of the literature, and Box 4.2 presents an analysis of the impact of immigration on wages in Germany.

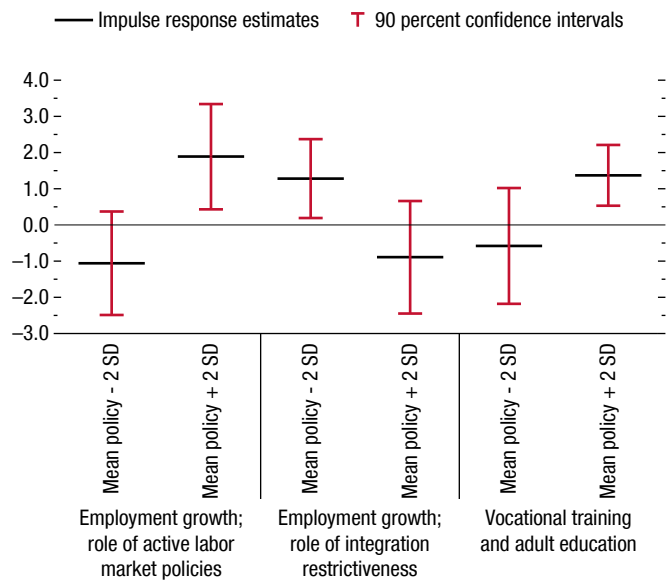
### The Role of Policies

To examine how policies influence the macroeconomic impacts of immigration, the estimation framework is extended by adding interactions between the immigration shock and different policy indicators. The analysis examines how different policies affect the response of the labor market in terms of total employment growth. Given the potential endogeneity

of policies, it is best to interpret this part of the analysis as uncovering correlations more than causal effects. The analysis considers three main policies: (1) higher spending on vocational training and adult education, (2) higher spending on active labor market policies, and (3) tighter policies related to the integration of immigrants.

Figure 4.18 plots the response of employment growth for levels of the policy indicator two standard deviations above or below the cross-country mean of the indicator. The figure shows that higher spending on vocational and adult training and on active labor market policies is associated with greater employment growth after an immigration shock. Conversely, tighter policies on the integration of immigrants are associated with lower employment growth. This latter result is in line with Chapter 2 of the April 2018 WEO, which finds that tighter immigration policies are associated with lower labor force participation.

**Figure 4.18. Policies and the Effects of Immigration on Employment Growth (Percent)**



Source: IMF staff estimates.

Note: This figure depicts the effect of a 1 percent increase in the migration-inflow-to-employment ratio in the destination country on employment growth for education spending equal to the mean of the sample plus or minus two standard deviations. The model is estimated based on a sample of Organisation for Economic Co-operation and Development countries during 1980–2018 using the local projections method of Jordà (2005). See Online Annex 4.3 for details of the model specification. The index of integration restrictiveness is calculated from the Immigration Policies in Comparison data set using the methodology in Schmid and Helbling (2016). SD = standard deviation.

<sup>12</sup>Beerli and others (2020) also present evidence of a fast response of investment to immigration in Switzerland. For the role of capital in capital following migrants, see Klein and Ventura (2009).

## The Effects of Refugee Immigration in Emerging Market and Developing Economies

Refugee migration, defined as people fleeing conflict or persecution, is substantially different from economic migration. Given the circumstances surrounding the need to flee, refugees typically leave on short notice, are less likely to target their destination country on the basis of their skills and knowledge of the language, and generally face substantial legal (and in refugee camps, physical) barriers to entering the labor market. Refugees are also more likely to be nonworking individuals. Refugee home and host countries tend to be primarily EMDEs. The empirical evidence shows that labor market outcomes of refugees are significantly worse than those of the native population and initially tend to generate net fiscal costs (Evans and Fitzgerald 2017; Brell, Dustmann, and Preston 2020).

Therefore, it is not surprising that the positive macroeconomic effects of immigration discussed in the previous section are not detectable in refugee immigration in EMDEs, at least in the short term. After a 1 percent increase in the inflow of refugees, there is no detectable short-term effect on output and productivity. However, the estimate presented is not meant to capture the very large cases of refugee inflows, such as the recent episodes of refugee immigration into Colombia, Jordan, and Lebanon. These episodes feature immigration flows greater than 4 percent of the recipient country's population and therefore are extreme compared with a typical large episode considered in this section.

Extreme episodes of refugee immigration are likely to have a significant macroeconomic impact. In EMDEs, refugee inflows can occur at a time when the recipient economy is already suffering from the negative spillovers of conflict in neighboring countries. This may further worsen the capacity of the labor market to absorb the inflow of refugees and increase the burden on public finances (IMF 2017a; 2017b). Labor market integration is facilitated when linguistic and cultural barriers are low and work permits are made available to the refugee population. In these cases, even a very large wave of refugees can be expected to increase GDP and employment, thus attenuating short-term fiscal costs associated with refugee-related spending (see Box 4.3 on the impact of emigration from Venezuela on Latin America and the Caribbean). The integration of refugees in advanced economies is affected by policies as well. Language training, physical and mental health

support, shorter refugee recognition processes, and shorter stays in asylum accommodations are all associated with improved labor market outcomes.<sup>13</sup> Regional dispersal policies, whereby asylum seekers are assigned to locations around the country, as well as temporary employment bans, tend to have detrimental effects (Brell, Dustmann, and Preston 2020).

Beyond economics, there are compelling humanitarian reasons to host and support refugees. The costs and difficulties created for host countries call for international coordination in the resettlement of refugees and in the sharing of fiscal costs (United Nations 2016).

## Model Simulations

The analysis of episodes of large immigration waves suggests positive economic effects on destination economies. Looking toward the future, one question remains open: what are the long-term macroeconomic implications of future migration trends at the global level and for the countries involved, including source countries? This section uses migration pressures estimated in the baseline scenario earlier in this chapter and simulations of a general equilibrium global model to help shed light on this question.

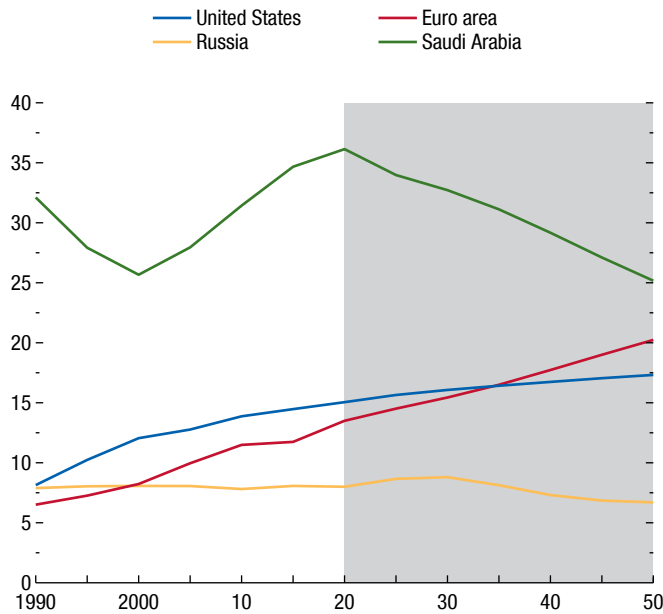
The model includes all Group of Twenty economies individually plus other regional groups. (See Online Annex 4.4 for a complete list of countries and for details on the model calibration.) The simulations, conducted through 2050, account for the macroeconomic effects of both future changes in domestic populations and future migration flows between a selected subset of countries. The impact of migration is calibrated according to the following assumptions:

- Total immigration into the subset of receiving countries evolves according to the baseline scenario outlined earlier in this chapter. Figure 4.19 depicts the evolution of immigration shares in the main recipient countries.
- The labor market outcomes of immigrants are calibrated for different countries according to the available evidence. Upon arrival, immigrants have lower productivity than natives (but still higher than the productivity they would have had in the origin

<sup>13</sup>See Joona and Nekby (2012); Aiyar and others (2016); Hainmueller, Hangartner, and Lawrence (2016); Sarvimäki and Hämäläinen (2016); Gathmann and Keller (2018); Battisti, Giesing, and Laurentsyeveva (2019); and Lochmann, Rapoport, and Speciale (2019).



**Figure 4.19. Simulated Stocks of Immigrants**  
(Percent of total population)



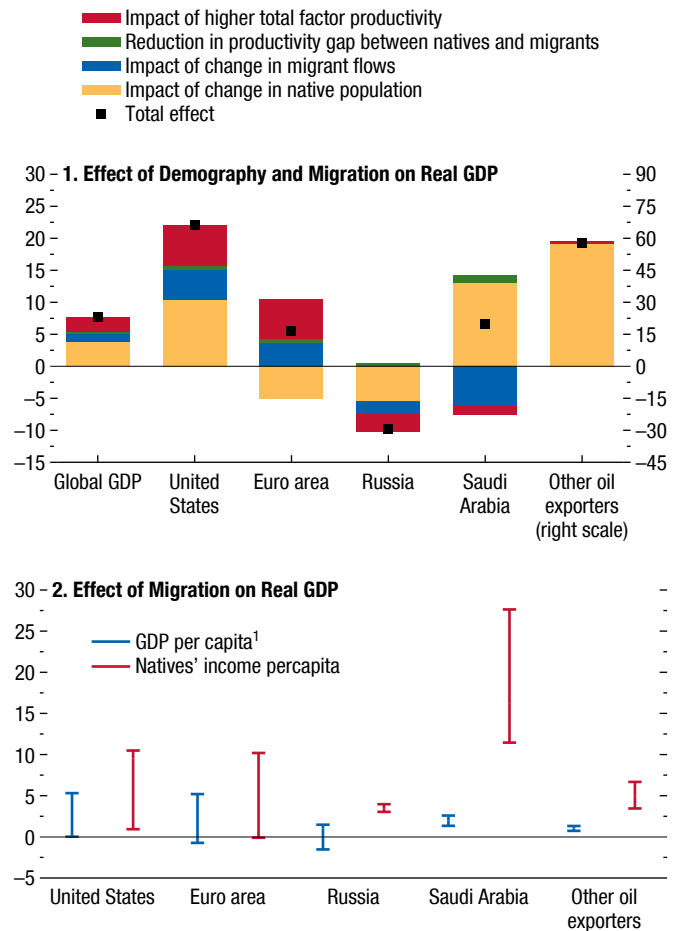
Sources: United Nations; and IMF staff estimates.  
Note: Migrants are defined as the foreign-born population.

country) and, correspondingly, earn a lower wage on average. Over time, the productivity of immigrants catches up with that of natives, and the wage gap closes within 15 years.

- Immigrants remit a fixed share of their labor income to their origin countries. They are subject to the same tax rates as natives, and they receive the same amount of transfers per capita as natives do from the government.<sup>14</sup>
- The model does not allow for an endogenous TFP increase after the arrival of immigrants, in contrast to the empirical findings reported earlier in this chapter. The simulations, therefore, mimic such an effect through an exogenous increase in the recipient economy's TFP. The calibration ranges from a lower bound of zero to an upper bound of a 1 percentage point increase in TFP for every additional 1 percentage point in the share of immigrant-to-total-employment ratio (as in Peri 2011b).

<sup>14</sup>In OECD countries, there are few differences between the benefits received by immigrants and those of native-born individuals. If anything, immigrants receive fewer benefits than do natives (OECD 2013).

**Figure 4.20. Macroeconomic Effects of Migration in Recipient Countries**  
(Percentage points)



Source: IMF staff estimates.  
<sup>1</sup>Net of remittances.

Panel 1 of Figure 4.20 presents the simulated effects on GDP at the global level and on the main group of migration recipient economies (all values are expressed in percentage deviations from the baseline). Native population growth increases world GDP by about 4 percent between 2020 and 2050. Abstracting from TFP and wage catch-up effects, migration flows alone (blue bars) are responsible for an additional 2 percent growth in global output. This contribution to global growth occurs because migration allows labor to move from low- to high-productivity countries. An additional but small contribution to global GDP comes from the gradual closing of the productivity gap between immigrants and natives (green bars),

but—more important—the positive TFP effect of immigrants (red bars) adds up to 4 percent to global growth. Looking at more disaggregated numbers, the impact on GDP is positive for the United States and the euro area, thanks to the combined effect of a larger labor force, increased investment, and potentially higher TFP. In the euro area, immigration helps to buffer the negative impact on the level of GDP from the decline in the native population. The negative effect on Russia and Saudi Arabia reflects, instead, the underlying reduction in immigration assumed for those countries.

Panel 2 of Figure 4.20 sets aside the effects of the domestic demography and focuses only on the total effect of immigration. Lower bars correspond to the case in which no TFP gains from migration are assumed, while higher bars represent the results with TFP gains. The figure reports, for each destination, the change in per capita income net of remittances sent home by immigrants and the change in per capita income of natives alone. Without TFP effects, small decreases in per capita net income are seen, especially in euro area countries. These reflect the fact that migrants—while more productive in the destination country than in their home country—are initially somewhat less productive than native workers. However, the effects turn positive, even with a relatively modest TFP increase, pointing to the importance of this type of productivity gain from migration. For the same reason, immigration does not have a large negative effect on the per capita incomes of natives and could possibly even increase those incomes substantially.

In principle, the fiscal implications of immigration may raise distributional concerns. However, immigrants are generally found to be associated with small budget surpluses or deficits of about half a percentage point of GDP (OECD 2013). In line with this conclusion, the model simulations find that, although immigrants receive lower labor income than natives and thus pay less in labor taxes, general equilibrium effects (which include an increase in capital income of natives) lead to overall small budget surpluses in destination countries, even without positive TFP effects.

What are the effects of migration on origin countries? In parallel to the rise in the GDP level in immigration countries, GDP falls in emigration economies in Europe, in the rest of the world, and in Mexico. Still, income per capita, including remittances

received from abroad, increases (see also Di Giovanni, Levchenko, and Ortega 2014). The positive impact on income per capita in Mexico is particularly strong once migrants are assumed to increase TFP in destination countries. In this case, remittances from Mexican migrants rise, while trade links with North America and higher world prices for oil exports (due to the rise in global GDP) lift the Mexican economy.

The simulations presented in this section paint a generally positive picture of the macroeconomic effects of migration in destination countries. However, it is important to recognize that the analysis does not tackle the distributional implications of migration (see Box 4.1). As with the distributional effects of international trade (see the April 2019 WEO), these can be relevant and may call for policy action. The analysis also does not incorporate some potentially negative effects on origin countries. Large emigration flows, by reducing the GDP level, can contribute to debt sustainability problems. Also, the simulations assume that emigration does not decrease TFP in source countries. However, negative productivity effects on source countries (Atoyán and others 2016) could materialize as, for example, when a “brain drain” leads to the emigration of more educated individuals (Grogger and Hanson 2011). At the same time, it is also possible that in some cases the opportunity to emigrate might itself create incentives to accumulate human capital, even among those who end up not emigrating.<sup>15</sup> Migration and technological change interact along several dimensions, some of which are explored in Online Annex 4.5.

## Conclusions

Migration generally improves the macroeconomic outcomes of recipient economies. The “dynamic gains” from immigration, in the form of rising TFP and investment, can be attributed to the complementarity between the skills of immigrants and natives. This chapter has found that these aggregate gains are large and quick to materialize.

Migrating is very costly, and as such, only a very small fraction of the world population migrates. While migrants are a remarkably stable share of the world

<sup>15</sup>On the effect of emigration on the income of natives in origin countries see Beine, Docquier, and Rapoport (2008); Docquier, Ozden, and Peri (2013); Dustmann, Frattini, and Rosso (2015); and Anelli and others (2019).

population, migration toward advanced economies has been growing rapidly and will likely continue to do so in the future. Demographic factors will play an important role in determining the size, direction, and impact of future migration. With advanced economies aging rapidly, and population growth continuing in EMDEs, migrants can play an important role in sustaining economic growth in destination economies.

EMDEs are both the origin and destination of most of the world's refugees, an especially vulnerable group of migrants. The conditions under which refugees migrate and the limited opportunities they have to participate in the labor market of their host countries substantially reduce their potential to contribute to their host economy. EMDEs are particularly exposed to migration induced by climate change. While the quantitative effect of climate change on migration

across regions is unclear, in poorer countries it is likely to cause significant increases in internal and regional migration flows.

On the policy front, the positive macroeconomic impact of immigration can bring negative distributional consequences for some individuals. This can be addressed through fiscal intervention aimed at achieving a more equitable distribution of aggregate gains. Policy action should also include measures that actively magnify the positive impact of immigration on the economy. Active labor market and retraining policies, together with immigration policies aimed at better integrating migrants, are associated with improved labor market outcomes following large immigration flows. International cooperation needs to complement national policies in addressing the challenges from refugee migration, especially into EMDEs.

### Box 4.1. Immigration: Labor Market Effects and the Role of Automation

Three main approaches have been used in the literature to address the challenges associated with empirically estimating the effects of immigration on natives' labor market outcomes (Peri and Sparber 2009; Peri 2014; Foged and Peri 2015; IMF 2015; National Academies of Sciences, Engineering, and Medicine 2017).

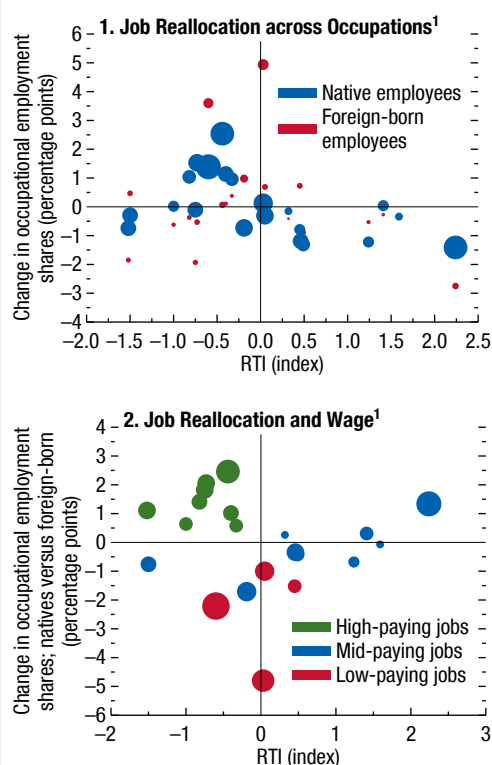
The spatial approach looks at the evolution of natives' wage and employment growth in high-immigration areas (Card 1990; Blau and Kahn 2015; Peri and Yasenov 2015; Borjas 2016). The skill cell approach estimates the effect of immigrants on the wages of other workers with similar skills (Borjas 2003). The production function approach imposes a theoretical structure on the degree of substitutability of different workers (Ottaviano and Peri 2011).

The overall conclusion from these studies is that the impact of immigration on the wages of natives is very small, especially at horizons of 10 years or more. However, the estimated effects are highly differentiated across different subgroups of natives. Low-skilled immigration affects more negatively natives who have not completed high school and possibly those belonging to disadvantaged minorities (Altonji and Card 1991; Borjas, Grogger, and Hanson 2012). Concerning the effects of high-skilled immigration, Peri, Shih, and Sparber (2015a; 2015b) estimates a positive impact on the wages and employment of both tertiary-educated and less-educated natives. Others find negative effects of high-skilled immigration within narrowly defined high-skilled groups (Borjas and Doran 2015). A still relatively unexplored topic is the distributional consequence of the interaction between immigration and automation. Automation and the corresponding loss of jobs at the middle of the income distribution lead to income polarization (Autor and Dorn 2013; Goos, Manning, and Salomons 2014). Basso, Peri, and Rahman 2017 finds that immigration into low-paying service jobs can attenuate the polarizing effects on the income of natives.

An interesting question is whether immigration encourages natives to upgrade their skills to access higher-paying occupations that benefit from automation. Data for 15 European countries are consistent with this possibility. Figure 4.1.1 shows the changes in employment shares of different occupations by

the level of their routine task intensity (Autor and Dorn 2013), an index measuring the extent to which tasks are "routine" and thus potentially automatable.<sup>1</sup> Two patterns emerge. First, overall employment shifts away from occupations (many of which are medium-paying) with an initially high routine task intensity (Figure 4.1.1, panel 1). Second, the employment shares of immigrants relative to those of natives grows in low-paying jobs (Figure 4.1.1, panel 2, red bubbles). Instead, again in relative terms, natives upgrade their skills as their employment share in high-paying occupations with lower routine task intensities increases (green bubbles). The adjustment to automation is thus more costly for immigrants.

**Figure 4.1.1. Automation and Labor Market Adjustment**



Sources: European Labor Force Survey; Goos, Manning, and Salomons (2014); and IMF staff estimates.

Note: RTI = routine task intensity.

<sup>1</sup>Data are for 15 European countries for 1998–2010. Bubble size represents the employment share in 2010.

The authors of this box are Philipp Engler and Roberto Piazza.

### Box 4.2. Immigration and Wages in Germany

Foreign labor has supported employment growth in Germany in the aftermath of the global financial crisis, with immigrants more than offsetting well-entrenched negative demographic trends. What was the impact of immigrants on wage growth in Germany? This box provides an answer to this question using both macro- and microeconomic evidence.

The German labor market underwent major reforms in the first half of the 2000s (known as the Hartz I-IV reforms), which led to a structural reduction in the unemployment rate. Once this is taken into account, wage growth in Germany is explained well by inflation expectations, productivity growth, and changes in labor market slack unrelated to immigration. This is in line with the traditional Phillips curve, and indicates that there has been no discernible residual contribution by immigration to wage growth at the macroeconomic level.

Microeconomic evidence from a large administrative panel data set from the Institut für Arbeitsmarkt- und Berufsforschung tends to confirm the outcome of the

Phillips curve analysis. After controlling for a wide set of individual characteristics, the business cycle, and endogeneity effects, there is no evidence that large immigration flows during 2012–16 had dampening effects on aggregate wage growth. Controlling for composition effects (immigrants tend to earn lower wages than natives and tend to be younger and less skilled), the marginal impact of immigration on wages is estimated to be slightly positive. Competition effects, which tend to depress the wages of workers who are highly substitutable by immigrants, were present but more than offset by complementarity effects between native and immigrant workers, which tend to boost the wages of native workers who complement immigrants in production. The evidence also suggests that immigration increased wages more in the relatively higher-wage job segment, where the within-sector skills complementarity with migrants is the largest. Negative wage pressures are detected on earlier cohorts of migrants typically active in the same sectors as the new migrants. All in all, taking composition, competition, and complementarity effects into account, the analysis suggests that immigration had negligible effects on the growth of aggregate wages in Germany.

The author of this box is Jean-Marc Natal. See also Klinger and others (2019).

### Box 4.3. The Impact of Migration from Venezuela on Latin America and the Caribbean

Venezuela is undergoing an economic and humanitarian crisis of unprecedented scale for a country not at war. Economic activity contracted by about 65 percent between 2013 and 2019, and extreme poverty rose from 10 percent of the population in 2014 to 85 percent in 2018.

In this context, Venezuela is experiencing one of the largest emigrations in history (Figure 4.3.1). The United Nations High Commissioner for Refugees estimates that 4.8 million Venezuelans (15 percent of the population) had emigrated by the end of 2019, with 4 million settling in other countries in Latin America and the Caribbean. Colombia received the largest number, followed by Peru, Ecuador, Chile, and Brazil. Based on current trends, the number of Venezuelan migrants could reach about 10 million in 2024, though this figure is highly uncertain.

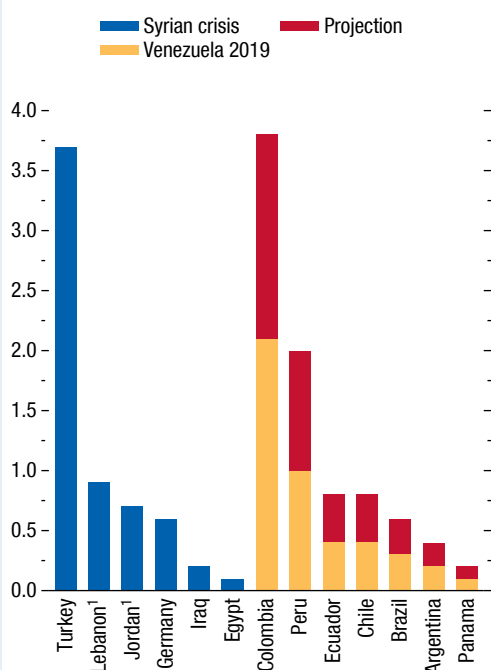
The large migration flows are expected to have mixed effects in recipient countries. In the short term, they are putting pressure on the provision of public services and labor markets. Over the medium term, because immigrants from Venezuela are relatively educated, they would also increase potential growth as the size and skills of the labor force expand. However, there are downside risks to the gains in growth if migrants do not integrate in an orderly manner.

In terms of budgetary pressures, recipient countries are providing support to migrants through humanitarian aid, health care, education, and labor market policies. Using data for Colombia for each of these categories as a benchmark, estimates suggest that public spending related to migration from Venezuela could reach about 0.5 percent of GDP in Colombia by 2024, 0.4 percent in Ecuador, 0.3 percent in Peru, and 0.1 percent in Chile. The impact on the fiscal deficit would be smaller, as tax revenue increases in line with the expanding economy.

Modeling techniques are used to estimate the impact of migration from Venezuela on growth in the recipient economies considering the age, number, and skill levels of migrants. The analysis also accounts for labor market displacements of local workers and skill mismatches, given that most migrants' skills are underutilized in the informal sector. In this setting,

The authors of this box are Jorge Alvarez, Hamid Faruquee, Emilio Fernandez-Corugedo, and Jaime Guajardo.

**Figure 4.3.1. Recent Crises: Main Recipients<sup>1</sup>**  
(Millions of people)



Source: United Nations High Commissioner for Refugees (UNHCR).

Note: <sup>1</sup>Unofficial estimates used by authorities are greater than those the estimates by the UNHCR.

Venezuela's migration is estimated to raise GDP by 3–5 percentage points between 2017 and 2027, driven by an expansion of the labor force and investment. Migration also leads to higher fiscal and current account deficits. The impact is largest for Colombia.

A key policy challenge in the region is how to manage the transition at a time when growth has slowed, social tensions have increased, and several countries need to reduce their fiscal deficits. In the near term, facilitating the integration of migrants into the domestic labor market and easing the process to validate their professional titles or to set up businesses would maximize the impact on growth and minimize the need for public support. Looking further ahead, providing access by migrants to education and health care will be key to ensuring that they have long and productive lives.

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