4

From Brain Drain to Brain Gain
Leveraging Emigration of High-Skilled Workers in Origin Countries

Chapter Highlights

- In most countries of origin, workers who emigrate have higher education levels than those who do not.
- The emigration of high-skilled workers is widespread in some of the smaller middle-income Europe and Central Asia (ECA) countries; about one-third of those with tertiary education from some countries in the Western Balkans live abroad.
- High-skilled emigration reduces human capital in countries of origin in the short run, which, under certain conditions, can generate labor shortages in essential sectors of activity, such as health, and affect productivity in home economies.
- In aging economies, high-skilled emigration can accelerate the decline in the working-age population and further shrink the fiscal base.
- Emigrants often come from the most disadvantaged areas in sending countries, potentially exacerbating the phenomenon of lagging regions.
- Despite high levels of educational attainment in countries of origin, high-skilled migrants from ECA often face occupational downgrade abroad.

- In the medium to long term, high-skilled emigration can incentivize investment in human capital in sending countries as a response to greater internal and external demand for skilled professionals.
- In a few ECA countries, the increase in the supply of high-skilled graduates in response to migration opportunities was sufficient to compensate for the outflow of workers, but not in others.
- Sending countries can benefit from their high-skilled diaspora in multiple ways, including remittances, knowledge transfers, and increased foreign direct investment and trade.
- High-skilled emigration can also raise productivity and create jobs in countries of origin through return migration: high-skilled return migrants are often more productive and engage more frequently in entrepreneurial activities compared with nonmigrants.
- In contrast with Western European countries, Central EU and Western Balkan countries of origin have been struggling to attract their qualified emigrants back.
- The net effects of high-skilled emigration for countries of origin depend on whether the costs from losing highly qualified workers outweigh the benefits from the remittances, knowledge spillovers, and productivity gains generated by these workers.

Main Policy Recommendations

- Origin countries that want to reduce high-skilled emigration must address its root causes through policies supporting the creation of domestic employment and labor market functioning, together with strengthening home institutions and public services.
- Given the strength of the push and pull factors behind high-skilled migration, well-managed labor mobility is critical to enhancing its potential benefits while reducing potential costs for migrants, origin countries, and destination countries.
- Establishing functioning skills monitoring systems in countries of origin is essential to help anticipate skills shortages in response to increased external demand.
- Expanding capacity and relaxing potential rigidities in the rapid expansion of the supply of high-skilled graduates is also crucial to help prevent or mitigate skill shortages associated with emigration.
- If educational systems cannot expand the skill supply in a timely manner, opening domestic labor markets to non-ECA countries in occupations where skill shortages are anticipated can help in importing

needed skills. Such measures, however, must be considered within the broader political and social context of each individual country.

- Global skill partnerships between sending and receiving countries, in which the latter provide technical and financial resources for the training of prospective migrants, can help better distribute the costs and benefits of high-skilled migration between origin and destination countries.
- Reforms in public education financing schemes in countries of origin, combined with bilateral agreements with destination countries, can also support a more equitable distribution of the costs and benefits of high-skilled migration.
- Strengthening ongoing efforts to certify foreign credentials across ECA can help reduce the brain waste associated with migrants' occupational downgrade.
- Programs to establish and engage diaspora networks, foster knowledge exchange, and support investment back home can help origin countries better leverage their high-skilled migrants.
- A first and low-cost step toward increasing the chances that high-skilled migrants will return is to remove the regulatory, bureaucratic, and informational barriers that inhibit return migration.
- The portability of social benefits across borders can also help alleviate bureaucratic constraints to return migration and incentivize returns from among the high-skilled diaspora.
- Financial incentives can be effective at increasing permanent return among high-skilled migrants, if they are large enough while being fiscally neutral.
- To support productive return of high-skilled migrants, reintegration plans need to be established, followed by a comprehensive set of at-scale interventions tailored to the identified needs of returnees.
- Policy interventions at the return stage must be informed by systematic impact evaluations to assess their effectiveness, ideally before scale-up.

Introduction

High-skilled migration is on the rise and widespread in Europe and Central Asia (ECA), especially from smaller middle-income countries. High-skilled emigration from ECA countries has been rising even more rapidly than overall migration. The number of high-skilled migrants in the European Union (EU), the main destination of high-skilled migrants from ECA, more than tripled over the 2004–18 period, increasing from about 4 million to 13 million. The share of high-skilled emigrants among total migrants increased from

21 percent in 2004 to 30 percent in 2019. In some countries in ECA—particularly smaller ones, such as those in the Western Balkans—the incidence of high-skilled emigration compared with the size of the working-age population is quite large. In Albania and Bosnia and Herzegovina, for example, it is estimated that close to 30 and 45 percent, respectively, of the working-age population with a tertiary degree lives abroad.

This chapter highlights that the impacts of high-skilled emigration on countries of origin are complex and multichanneled, generating both costs and benefits over different time horizons. They are also highly context dependent and heavily influenced by the emigration experience of origin countries and their demographic structure. As shown in the "Patterns, Trends, and Heterogeneity in High-Skilled Emigration in Europe and Central Asia" section of this chapter, emigration from ECA countries is heterogeneous in terms of magnitude, skill intensity, and occupational content. Policy parameters, as shown in this chapter, also play an important role in the way high-skilled emigration affects labor markets and broader welfare outcomes in countries of origin. Depending on these parameters, skilled emigration produces both costs and benefits, which vary in the short, medium, and long run.

A leading concern in countries of origin is that high-skilled emigration, often referred to as "brain drain," may create shortages in essential occupations, increase fiscal pressures, and affect job creation and growth. Mechanically, high-skilled emigration reduces the stock of human capital in origin countries in the short run, especially if emigrants are positively selected (more skilled, on average, than the origin country population who does not emigrate), which is the case in most ECA countries. Although the emigration of high-skilled migrants also comes with a range of benefits, as discussed in this chapter, it can be problematic if the departure of high-skilled workers results in domestic labor shortages, especially in critical sectors and occupations for which internal demand is high (World Bank 2023). One example is the case of health professionals such as doctors or nurses and information technology (IT) professionals. The departure of such workers could also negatively affect the productivity, innovation, and growth of the broader economy in the short run. In ECA countries with an already aging population and low fertility rates, such as those in the Central EU and the Western Balkans, the departures also exacerbate population aging and labor force shortages and can worsen the gap between prospering and lagging regions. This also raises related concerns about the sustainability of pension systems. From a fiscal standpoint, outflows of high-skilled labor also shrink the fiscal base, especially when emigration is concentrated among higher-paid workers.

As shown in this chapter, high-skilled migration also generates benefits for countries of origin, primarily through remittances, knowledge

transfers, investment in human capital, and return migration. As discussed in the "Medium- and Long-Term Impacts on Origin Countries" section, in the medium run, emigration can help alleviate unemployment pressures in sending regions that are struggling to create more and better jobs, especially for youth. It may also lead to a reallocation of labor to more productive sectors. Furthermore, high-skilled emigration opportunities can increase the stock of human capital in the medium to long term, a phenomenon referred to as "brain gain." A key mechanism through which this can occur is by incentivizing investments in tertiary education in response to rising returns to higher skill levels driven by foreign demand. In addition, if high-skilled migrants return, countries of origin can benefit from the human and financial capital gained by the migrants while abroad. The initial brain drain can thus, under certain conditions, turn into a net increase in human capital in countries of origin in the longer term. Using the case of medical doctors, the chapter shows that brain gain has been observed in some countries of origin in ECA but not in others. This suggests that local context and policy parameters are key to maximizing the benefits of brain circulation and turning brain drain into brain gain. As the chapter shows, the presence of high-skilled workers abroad can also produce a range of positive spillovers on countries of origin through remittance flows, knowledge transfers, and international networks and a reduction in transaction and trade costs. The extent to which countries of origin benefit from such spillovers is shaped by policies and programs in place to better leverage high-skilled mobility.

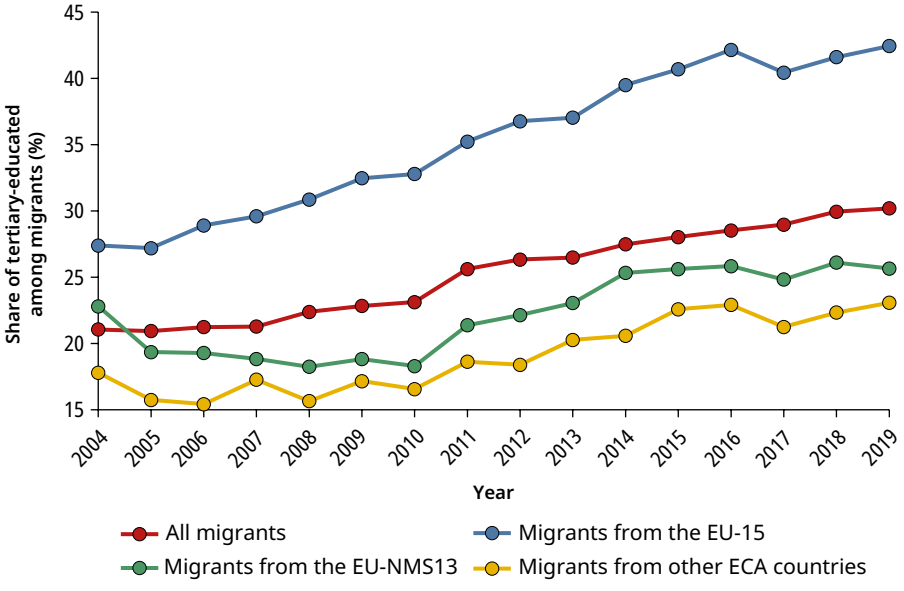
The chapter proposes policies that can be implemented by origin countries, some of them in collaboration with destination countries, to reduce the costs and enhance the benefits of high-skilled emigration. Building on the evidence provided in the "Patterns, Trends, and Heterogeneity in High-Skilled Emigration in Europe and Central Asia," "Short-Term Impacts of High-Skilled Emigration on Origin Countries," and "Medium- and Long-Term Impacts on Origin Countries" sections, the "Policy Recommendations" section discusses educational and skills-training policies that can ensure a fairer distribution of the costs and benefits of high-skilled emigration between origin and destination countries. It also examines options to enhance the benefits of the high-skilled migration experience for all actors, including migrants. Finally, it discusses policy options to increase the return flows of high-skilled migrants and to take better advantage of the human and financial capital that return with high-skilled migrants, and their migration experience more broadly. Although some of these policies can be implemented unilaterally by countries of origin, others require close coordination with destination countries, or even at the regional level with other countries of origin.

Patterns, Trends, and Heterogeneity in High-Skilled Emigration in Europe and Central Asia

Rising Skill Level of Emigrants from ECA Countries

The skill level of emigrants from ECA countries has been rising. The share of high-skilled emigrants among total migrants within the European Union increased from 21 percent in 2004 to 30 percent in 2019 (refer to figure 4.1). Migrants from EU-15 countries (that is, countries that were European Union members before 2004) to other EU countries have traditionally had higher educational attainment relative to the overall population of the EU-15. This pattern has become more pronounced over time because the share of migrants with tertiary education from the EU-15 has risen more rapidly than the corresponding share in the overall EU population. In recent years, almost one-half of migrants from the EU-15 to other EU countries have had tertiary degrees. Compared with migrants from the EU-15, migrants from new member states in the Central EU have

FIGURE 4.1
Share of migrants (ages 25–64 years) with tertiary education, European Union, by region of origin

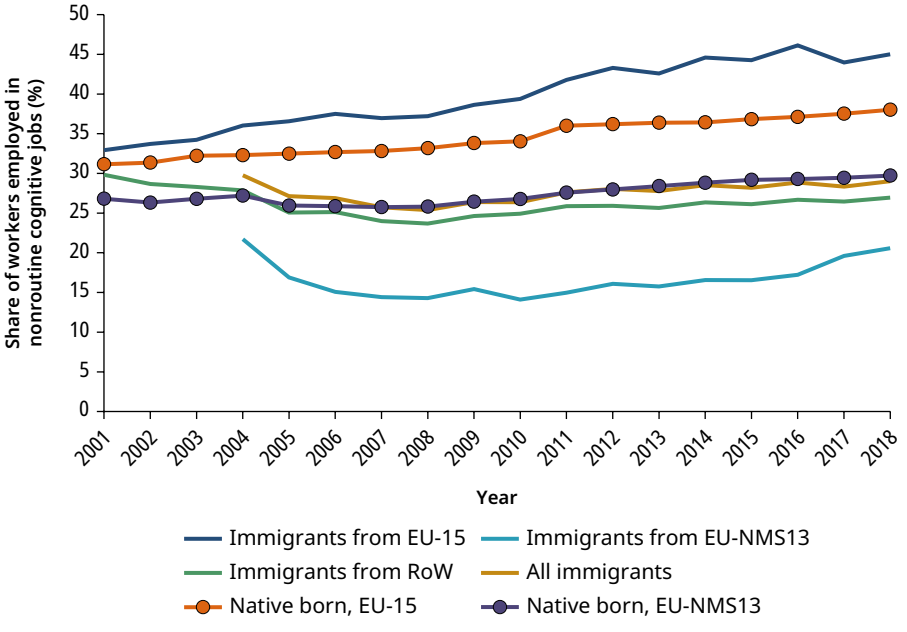


Sources: Original calculations based on the EU Labour Force Survey (database), Eurostat (https://ec.europa.eu/eurostat/statistics-explained/index.php/EU_labour_force_survey); Russia Longitudinal Monitoring Survey (https://rlms-hse.cpc.unc.edu/); and Turkish Household Labor Force Surveys (https://webapps.ilo.org/surveyLib/index.php/catalog/LFS/?page=1&country%5B%5D=218).
Note: EU-15 = European Union members before 2004; EU-NMS13 = new member states joining the European Union in 2004, 2007, and 2013.

lower overall educational attainment, reflecting the lower human capital at origin. In addition, the share of migrants with tertiary education has increased less rapidly among migrants from the 13 new member states joining the European Union in 2004, 2007, and 2013 (EU-NMS13) and from the rest of the world than it has among migrants from the EU-15.

The share of migrants in occupations requiring nonroutine tasks is rising more quickly in the European Union than among the overall population. Reflecting technological change, the share of workers engaged in nonroutine cognitive tasks in the European Union has increased, although at a moderate pace. The share has grown more rapidly in the EU-15 than in the EU-NMS13 (refer to figure 4.2). Meanwhile, the share of individuals engaged in such activities has risen more quickly among migrants from the EU-15 than among the overall EU population, reflecting a large increase in the share of high-skilled migrants from the EU-15. In addition, the share of

FIGURE 4.2
Workers (ages 25–64 years) employed in nonroutine cognitive jobs, European Union



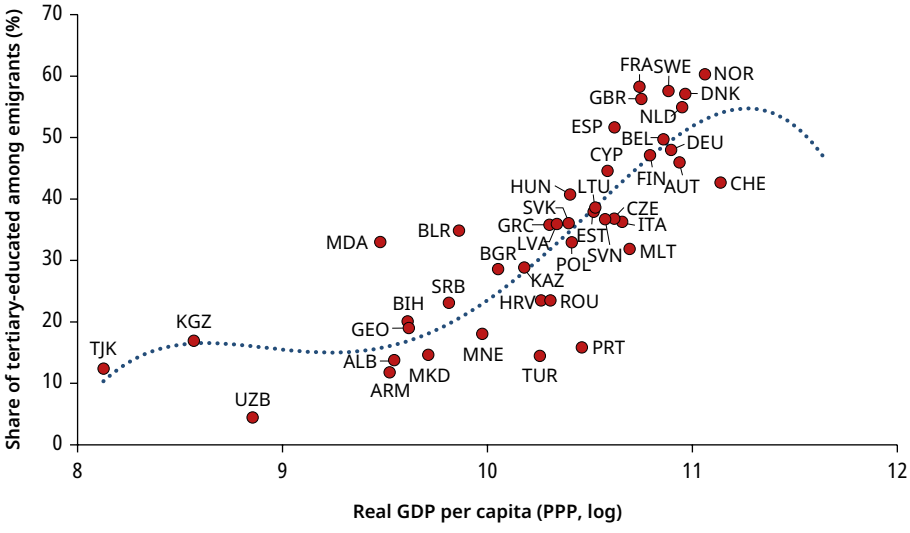
Source: EU Labour Force Survey (database), Eurostat (https://ec.europa.eu/eurostat/statistics-explained/index.php/EU_labour_force_survey).
Note: Nonroutine jobs are those that involve activities that are not repetitive or based on rules and may require flexibility and task switching. Cognitive jobs are those that involve problem solving and analysis and are associated with higher educational attainment. Nonroutine cognitive jobs include public relations and analytical, medical, and technical positions. EU-15 = European Union members before 2004; EU-NMS13 = new member states joining the European Union in 2004, 2007, and 2013; RoW = rest of the world.

migrants from the EU-NMS13 and the rest of the world who are engaged in nonroutine cognitive tasks has risen at a more moderate pace, although still more rapidly relative to the share among the overall population.

Disparities in High-Skilled Emigration across Country, Region, and Sector Activity

The skill content of emigrants varies across countries. Not surprisingly, skill content is closely linked to levels of economic development in countries of origin (refer to figure 4.3). High-skilled emigration predominates in high-income countries in Western Europe, such as Belgium, France, the Netherlands, and Spain, as well as in Scandinavian countries, where more than half of the working-age population emigrating holds a tertiary degree. In contrast, the share of tertiary-educated emigrants is below 10 percent in some poorer origin countries in Central Asia, the Caucasus, and the

FIGURE 4.3
Economic development and skill content of emigration

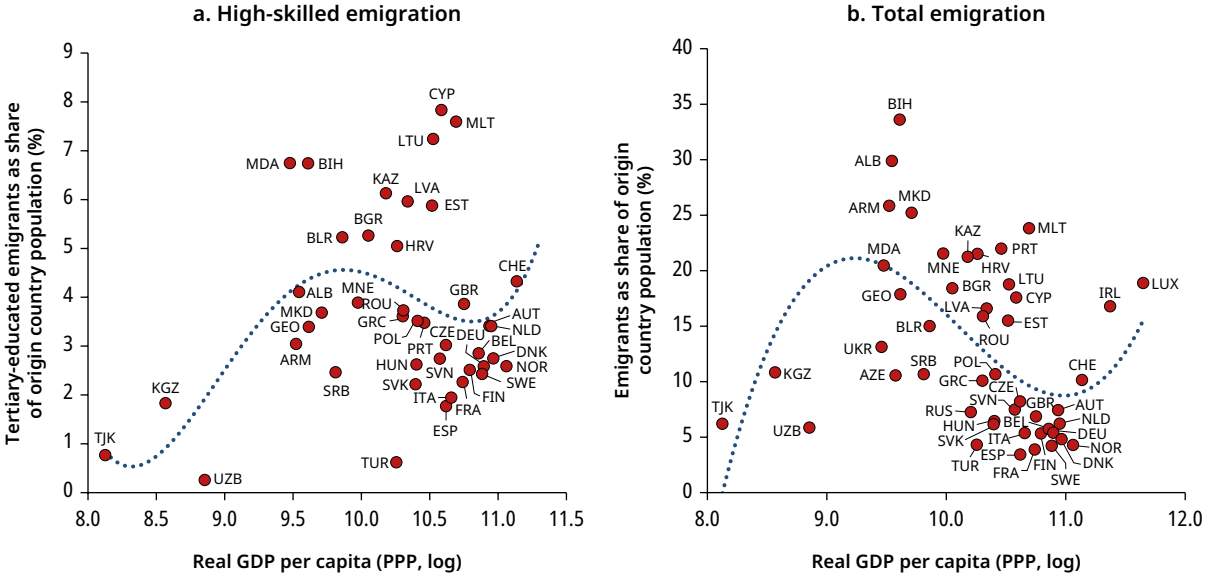


Sources: UN Department of Economic and Social Affairs International Migrant Stock 2020 (https://www.un.org/development/desa/pd/content/international-migrant-stock); Organisation for Economic Co-operation and Development Database on Immigrants in OECD and Non-OECD Countries 2015 (https://www.oecd.org/els/mig/dioc.htm); Russia Labor Force Survey 2017, Armenia Labor Force Survey 2018, and Kyrgyz Integrated Household Survey 2018 (for information on Labor Force Surveys, see https://webapps.ilo.org/surveyLib/index.php/catalog/LFS/?page=1&ps=15&repo=LFS); Listening to the Citizens of Tajikistan 2017 (https://www.worldbank.org/en/country/tajikistan/brief/listening2tajikistan); and Listening to the Citizens of Uzbekistan 2018 (https://www.worldbank.org/en/country/uzbekistan/brief/l2cu#1).
Note: Purchasing power parity is used to compare the value of a country's currency to another country's currency by looking at the price of a basket of goods and services in each country. For a list of country codes, go to https://www.iso.org/obp/ui/#search. GDP = gross domestic product; Log = logarithmic scale; PPP = purchasing power parity.

Western Balkans. In the Central EU economies, the skill intensity of emigration is more moderate, with 20–35 percent of emigrants having some tertiary education.

Globally, emigration has been shown to increase with the level of development until a certain point at which it starts to decrease (Clemens 2014; Dao et al. 2018). A similar pattern is observed for high-skilled emigration from ECA countries (refer to figure 4.4, panel a). High-skilled emigration initially increases as countries move from a low-income level (Central Asian economies) to a middle-income level. Middle-income and middle- to high-income countries have the highest incidence of high-skilled emigration per the working-age population. Once higher- to middle-income levels are reached, however, the incidence of high-skilled emigration among those who are working age declines overall, despite higher levels of educational attainment in richer countries. Differences in the incidence of high-skilled emigration among the population of origin countries are partly

FIGURE 4.4
Economic development and emigration

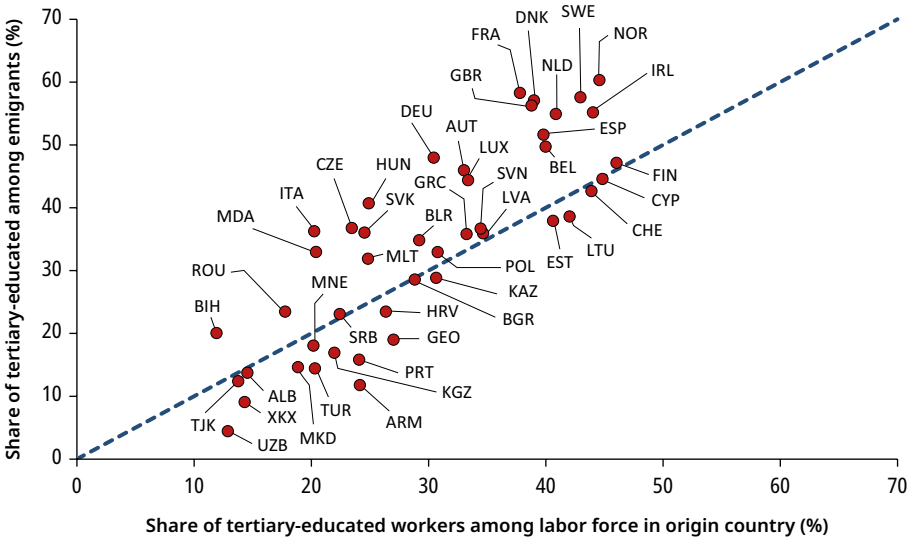


Sources: UN Department of Economic and Social Affairs International Migrant Stock 2020 (https://www.un.org/development/desa/pd/content/international-migrant-stock); Organisation for Economic Co-operation and Development Database on Immigrants in OECD and Non-OECD Countries 2015 (https://www.oecd.org/els/mig/dioc.htm); Russia Labor Force Survey 2017, Armenia Labor Force Survey 2018, and Kyrgyz Integrated Household Survey 2018 (for information on Labor Force Surveys, see https://webapps.ilo.org/surveyLib/index.php/catalog/LFS/?page=1&ps=15&repo=LFS); Listening to the Citizens of Tajikistan 2017 (https://www.worldbank.org/en/country/tajikistan/brief/listening2tajikistan); and Listening to the Citizens of Uzbekistan 2018 (https://www.worldbank.org/en/country/uzbekistan/brief/l2cu#1).
Note: High-skilled emigrants are defined as individuals with tertiary education who live abroad. Purchasing power parity is used to compare the value of a country's currency to another country's currency by looking at the price of a basket of goods and services in each country. For a list of country codes, go to https://www.iso.org/obp/ui/#search. GDP = gross domestic product; Log = logarithmic scale; PPP = purchasing power parity.

driven by a decline in overall emigration rates as ECA countries further develop toward high-income levels (refer to panel b of figure 4.4). This is likely driven by a reduction in push and pull factors to migrate as origin countries reach high-income status.

The high skill content of emigrants also reflects the profile of workers who choose to or can emigrate. Workers who emigrate often have a different skill profile from those who do not. They may be, on average, more highly educated than workers who do not emigrate (positive selection) or, in some cases, less educated (negative selection). The sign of selection into emigration is determined by the relative wage structure and skill premium at origin and at destination (Docquier, Lohest, and Marfouk 2007; Docquier and Rapoport 2012; World Bank 2018). Figure 4.5 displays the share of emigrants from ECA countries who have attained some tertiary education,

FIGURE 4.5
Share of workers with tertiary education, by emigration status



Sources: UN Department of Economic and Social Affairs International Migrant Stock 2020 (https://www.un.org/development/desa/pd/content/international-migrant-stock); Organisation for Economic Co-operation and Development Database on Immigrants in OECD and Non-OECD Countries 2015 (https://www.oecd.org/els/mig/dioc.htm); Russia Labor Force Survey 2017, Armenia Labor Force Survey 2018, and Kyrgyz Integrated Household Survey 2018 (for information on Labor Force Surveys, see https://webapps.ilo.org/surveyLib/index.php/catalog/LFS/?page=1&ps=15&repo=LFS); Listening to the Citizens of Tajikistan 2017 (https://www.worldbank.org/en/country/tajikistan/brief/listening2tajikistan); and Listening to the Citizens of Uzbekistan 2018 (https://www.worldbank.org/en/country/uzbekistan/brief/l2cu#1).
Note: The dashed 45-degree line represents parity in the share of emigrants and stayers with tertiary education in each country of origin. In countries above the line, the share of emigrants with tertiary education is higher than that of stayers; in countries below the line, the share of emigrants with tertiary education is lower than that of stayers. For a list of country codes, go to https://www.iso.org/obp/ui/#search. Kosovo has no ISO 3166 code and has been given a user-assigned code XKX. This designation is without prejudice to positions on status and is in line with United Nations Security Council Resolution 1244/1999 and the International Court of Justice Opinion on the Kosovo declaration of independence.

together with the share of tertiary-educated nonmigrants, by country of origin. As shown in the figure, most countries of origin in ECA are above the 45-degree line. This indicates that in most countries, emigrants are on average more educated than the population that does not emigrate. Positive selection in emigration is especially pronounced in Scandinavian countries, as well as in France and Italy, which are far above the 45-degree line. In comparison, a few countries in ECA, such as some in the Caucasus, Central Asia, and the Western Balkans, exhibit negative selection in emigration, in addition to lower levels of human capital among the working-age population overall.

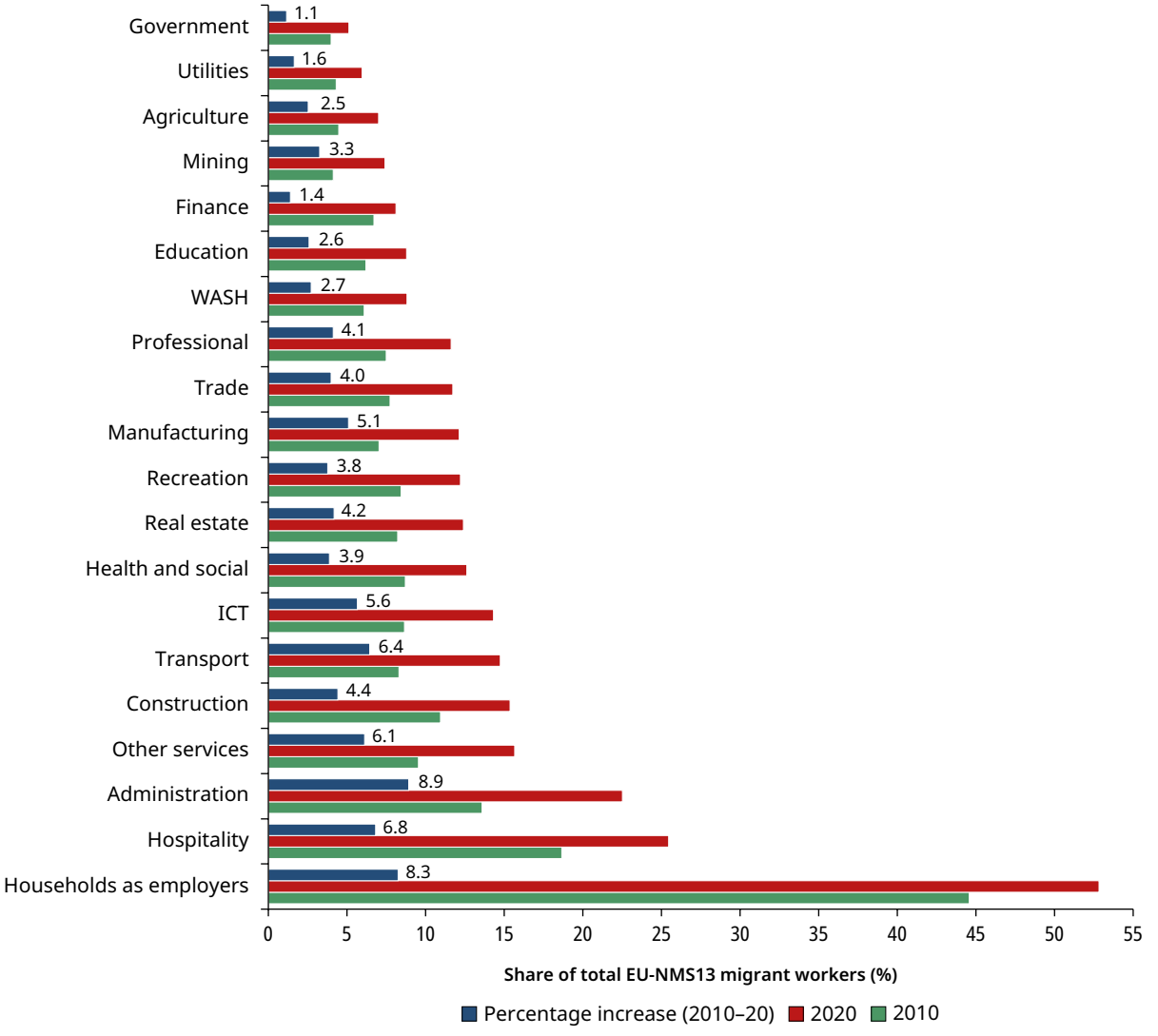
Emigration from the Central EU countries and the Western Balkans is more pronounced in high-skilled sectors such as health or IT, which are considered critical occupations. Emigration from EU-NMS13 countries after the EU enlargement has been more pronounced in some sectors than in others (refer to figure 4.6). The increase in emigration has been especially large in the health care and social sectors: the share of workers from the Central EU working in those sectors employed abroad (as opposed to their origin countries) more than tripled between 2008 and 2018.[1] By 2014, outflows of doctors from the EU-NMS13 and the southern EU-15 had reached, respectively, 0.7 percent and 1.5 percent of the total stock of physicians in these regions. In Estonia and Romania, the annual emigration of health professionals, including doctors, averaged 3.9 percent and 2.5 percent, respectively, during the same period. High emigration rates in the health care sector have also been observed in the Western Balkans (OECD 2022): in 2017–18, more than 2,700 home-trained Serbian doctors and 1,500 home-trained North Macedonian doctors were identified in Organisation for Economic Co-operation and Development (OECD) countries, representing an emigration rate of about 8 percent and 22 percent, respectively (OECD 2022). Emigration also rose significantly among high-skilled workers from the IT sector: the share of IT sector workers from the Central EU employed in other EU countries more than doubled from 2008 to 2018, representing 15 percent of the total stock of information and communications technology (ICT) workers in origin countries in 2018.

Characteristics and Occupational Patterns of High-Skilled Emigrants

High-skilled emigration is driven by large wage disparities in high-skilled occupations across the region. Even within the European Union, where wage differentials for high-skilled workers have been declining, average wage differentials between Western and Central EU countries remain large, especially among workers with tertiary education (refer to figure 4.7). This acts as a key determinant of skilled migration from the Central to the

FIGURE 4.6

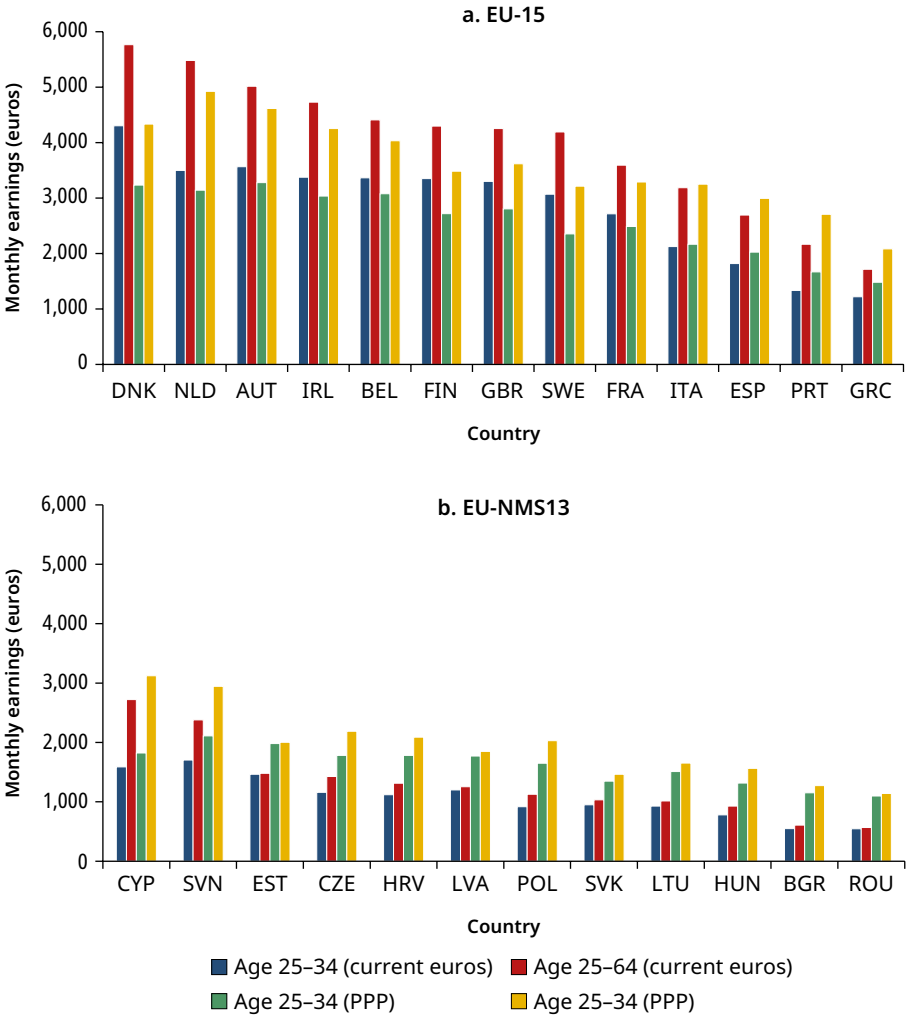
Share of workers from 13 new member state countries who are employed in the other 28 EU countries, by sector of activity



Source: Original calculations based on EU Labour Force Survey, Eurostat (https://ec.europa.eu/eurostat/statistics-explained/index.php/EU_labour_force_survey).
Note: The share of emigrants is the number of EU-NMS13 emigrants in other EU countries working in a specific NACE one-digit sector divided by the total number of people born in EU-NMS13 countries working in that same sector (both in their home EU-NMS13 countries or abroad in other EU countries). EU = European Union; EU-NMS13 = new member states joining the European Union in 2004, 2007, and 2013; ICT = information and communications technology; NACE = Nomenclature des Activités Économiques dans la Communauté Européenne; WASH = water, sanitation, and hygiene.

Western EU. A young graduate from Bulgaria or Romania working in Austria or the Netherlands, for example, can expect to earn about 6.5 times the wage that they would back home, and in Denmark the wage would be almost 8 times greater. Part of these large gaps is mitigated by the higher costs of living in receiving countries. Still, in purchasing power standards, young

FIGURE 4.7
Full-time gross monthly earnings of tertiary-educated workers, European Union



Source: Bossavie et al. 2022.
Note: Wages are expressed in current euros or euros adjusted by purchasing power standards (which consider differences in price levels across countries). Purchasing power parity is used to compare the value of a country's currency to another country's currency by looking at the price of a basket of goods and services in each country. For a list of country codes, go to https://www.iso.org/obp/ui/#search. EU-15 = European Union members before 2004; EU-NMS13 = new member states joining the European Union in 2004, 2007, and 2013; PPP = purchasing power parity.

graduates from Bulgaria or Romania can expect to earn up to three times the wages in Austria or the Netherlands as they would earn in their countries of origin. Not only can high-skilled workers earn higher wages by moving to another ECA country, but they can also increase their likelihood of finding employment: unemployment rates are significantly higher in ECA origin countries than in the main destination countries. In the Western Balkans,

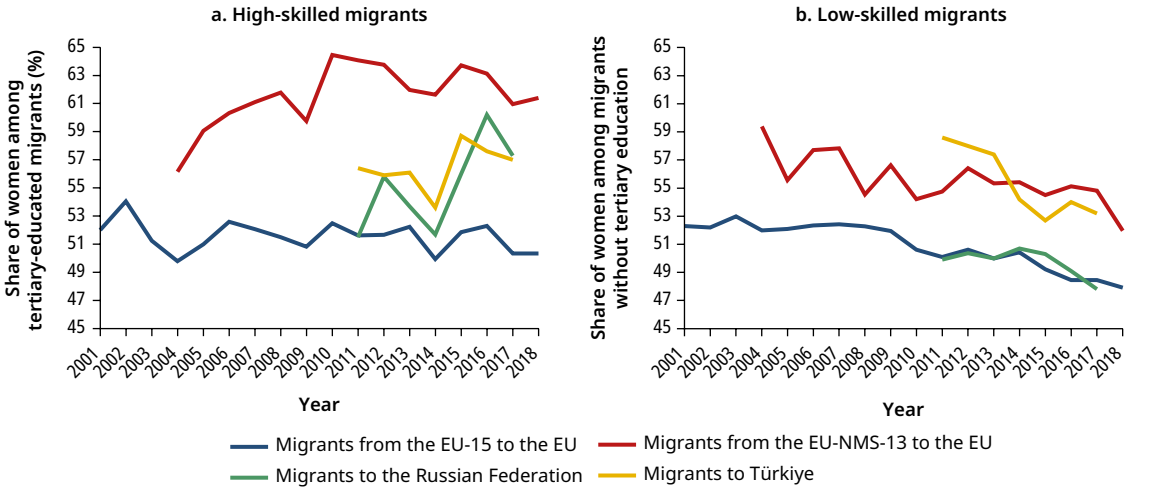
the average unemployment rate is at around 16 percent, ranging from 9 percent in Serbia to as much as 26 percent in Kosovo, which is more than double the EU average (OECD 2022). Because high-skilled workers are typically more mobile across countries than low-skilled migrants, they are more likely to benefit from better-alternative job opportunities abroad, also thanks to the free movement of labor in the European Union.

High-skilled migration flows are largely directed to the European Union. As with overall migration, the concentration of highly educated migrants is largely in EU-15 countries (97 percent of all skilled migrants in the European Union). Disparities in skill content across EU regions and countries of destination are also large: in most regions of the Nordic countries and the United Kingdom, for example, more than half of migrants from the European Union have a tertiary education degree. In Italy, in contrast, a minority of immigrants have attained some tertiary education. In countries such as France and Spain, the prevalence of high-skilled migrants varies quite substantially by region. In terms of the share of the total adult population (ages 25–64), high-skilled migrants represent more than 15 percent of that population in some urban areas in Ireland, Switzerland, and the southeastern United Kingdom, surpassing 10 percent in the metropolitan areas of Luxembourg, Paris, Stockholm, and Vienna.

In contrast to low-skilled emigration, women represent a large and increasing share of high-skilled migrants. Women now constitute most high-skilled migrants within ECA (refer to figure 4.8). The share of high-skilled female emigrants has been on the rise in recent years, especially from the EU-NMS13 to EU countries, but also to the Russian Federation and Türkiye. Although this partly reflects rising female labor force participation in origin countries, women are overrepresented among high-skilled migrants from ECA relative to the share of women in the high-skilled active population in origin countries. In contrast to the broad gender parity among migrants from the EU-15, women are now overrepresented among migrants from the EU-NMS13, especially among those who are highly educated. Additionally, the share of women among EU-NMS13 migrants with tertiary education has been rising, whereas among migrants from the EU-15, it has remained constant. Finally, more than half of high-skilled migrants from the Western Balkans to EU countries are women (OECD 2022).

Compared with the overall working-age population, highly educated migrants are concentrated among younger age groups. Like all migrants, high-skilled migrants to the European Union tend to be clustered in the 25–44 age group (Bossavie et al. 2022; World Bank 2018). This is particularly true for high-skilled migrants coming from EU-NMS13 countries, among whom 70 percent are within that age range, compared with only 54 percent of native-born workers. In contrast, high-skilled

FIGURE 4.8
Share of women among international migrants ages 25–64, Europe and Central Asia



Sources: Original calculations based on the European Union Labour Force Survey (database), Eurostat (https://ec.europa.eu/eurostat/statistics-explained/index.php/EU_labour_force_survey); Russia Longitudinal Monitoring Survey (https://rlms-hse.cpc.unc.edu, http://www.hse.ru/org/hse/rlms) and Turkish Household Labor Force Surveys (https://webapps.ilo.org/surveyLib/index.php/catalog/LFS/?page=1&country%5B%5D=218).
Note: High-skilled migrants are defined as foreign-born individuals with some tertiary education. Low-skilled migrants are defined as foreign-born individuals without tertiary education. EU-NMS13 = new member states joining the European Union in 2004, 2007, and 2013; EU-15 = European Union members before 2004.

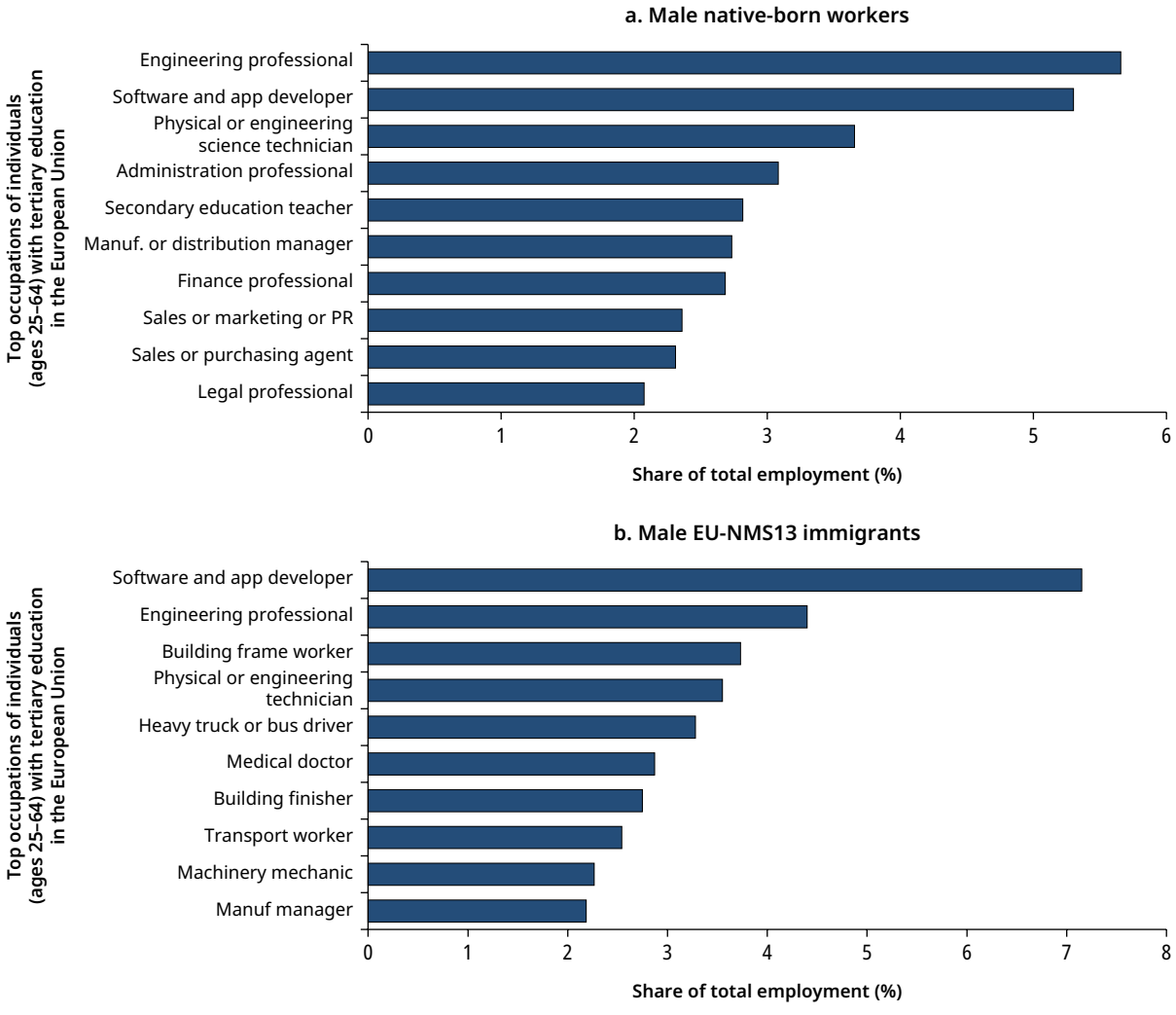
migrants from EU-15 countries have an age distribution more like that of native-born workers. The age distribution of high-skilled emigrants is important to keep in mind when assessing the impacts of emigration on countries of origin, especially in the context of the overall aging observed in the labor market.

High-skilled migrants from ECA are concentrated in occupations requiring more quantitative or analytical skills. Workers who migrate from ECA countries to the European Union work in different occupations than native-born workers in receiving countries (Bossavie et al. 2022). As shown in figure 4.9, native-born male workers in the European Union are more likely to have jobs requiring communication skills (for example, sales, legal and finance professionals, teachers, and administrative workers), whereas high-skilled migrants concentrate in occupations requiring more quantitative or analytical skills. Those include ICT professionals, software developers, engineers, and medical doctors. Software and application development is the leading occupation of high-skilled migrants from the EU-NMS13 to the European Union (refer to figure 4.9, panel b). High-skilled female migrant workers have a different occupational profile than high-skilled male migrant workers (refer to figure 4.9, panels b and d). Their occupational profile also differs strongly from that of native-born

women: they primarily concentrate in personal care, household services, sales, and the medical profession, whereas teaching is the most common occupation among high-skilled native-born women (refer to figure 4.9, panels c and d).

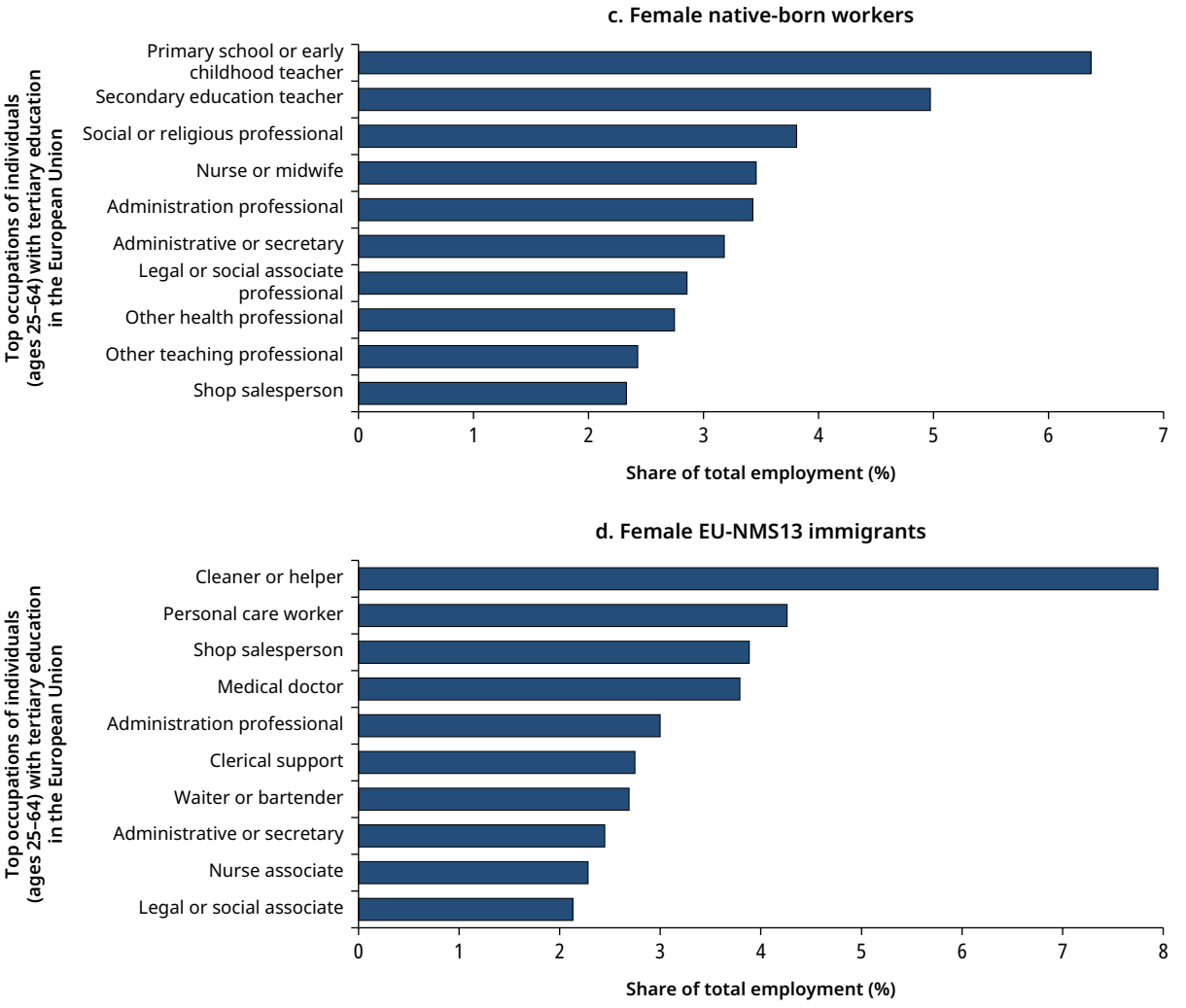
High-skilled migrants, especially from non-EU countries, often face occupational downgrade. *Occupational downgrade* refers to being employed in a lower-skilled occupation than one's formal level of educational attainment would predict. By region of origin, occupational downgrade particularly affects highly educated migrants from the EU-NMS13. Immigrants from the EU-NMS13 have, on average, 1.3 more years of

FIGURE 4.9
Top occupations of individuals (ages 25–64) with tertiary education, European Union



Continued

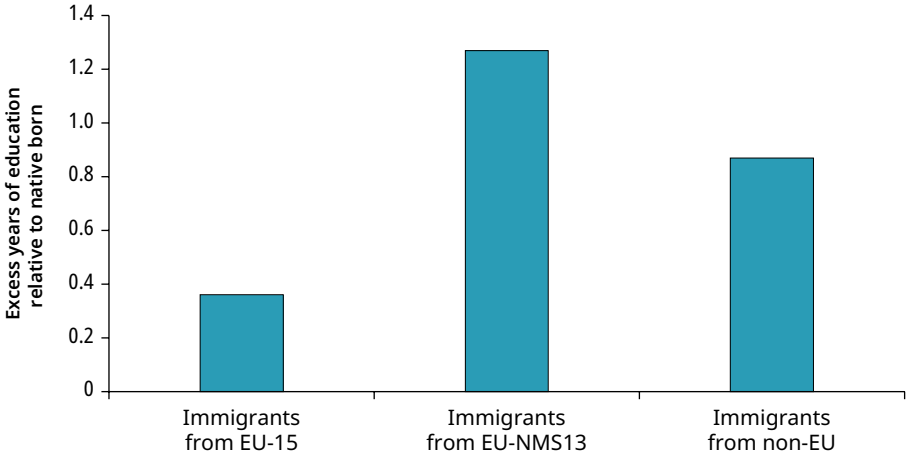
Figure 4.9
Top occupations of individuals (ages 25–64) with tertiary education, European Union *(Continued)*



Source: Bossavie et al. 2022, based on the European Union Labour Force Survey.
Note: EU-NMS13 = new member states joining the European Union in 2004, 2007, and 2013; Manuf. = manufacturing; PR = public relations.

schooling than do native-born workers in the same occupation, whereas the gap is only 0.3 years (about 3.5 months) for tertiary-educated EU-15 migrants (refer to figure 4.10). Overqualification among high-skilled migrants from non-EU ECA countries, such as in the Western Balkans, is also widespread: more than half of the migrants from Albania (56 percent) and Kosovo (61 percent) were overqualified in 2015–16 compared with about one-third of highly skilled migrants in OECD countries overall. This rate of overqualification among migrants from Kosovo, Montenegro, North Macedonia, and Serbia has also risen in recent years (OECD 2022).

FIGURE 4.10
Number of years of education relative to occupational mean, European Union, by migrants' region of origin



Source: Original calculations based on data from the European Union Labour Force Survey 2018 (database), Eurostat (https://ec.europa.eu/eurostat/statistics-explained/index.php/EU_labour_force_survey).
Note: The figure compares the excess education of tertiary-educated migrants versus tertiary-educated native-born workers. *Excess education* refers to a person's years of education compared with the average years of education of workers in the same occupation (using ISCO-08 three-digit level). EU-15 = European Union members before 2004; EU-NMS13 = new member states joining the European Union in 2004, 2007, and 2013; ISCO = International Standard Classification of Occupations.

Occupational downgrade is observed for both female and male migrants from ECA countries. Occupational downgrade among high-skilled female migrants to the European Union is striking because the top two occupations of tertiary-educated female migrants from the EU-NMS13 are cleaners-helpers and personal care workers (refer to figure 4.9, panel d). Among qualified EU-NMS13 female migrant workers, five of the top 10 jobs require medium to low skill levels. According to the 2018 EU Labour Force Survey, five of the top 10 occupations in which highly educated male EU-NMS13 migrants work can be categorized as low skill (building frame workers, heavy truck or bus drivers, building finishers, transportation or storage workers, and machinery mechanics) compared with none of the top 10 occupations for high-skilled male native-born workers.

The occupational downgrade of high-skilled migrants is linked to imperfect transferability of skills combined with informational barriers (Borjas 2015; Friedberg 2000). Migrants' skills and human capital are often imperfectly transferred when they seek work in destination countries' labor markets. This can occur because of language barriers, which can, for example,

prevent migrants from accessing occupations with high communications content in destination countries. It can take place because the value of an educational degree obtained in the country of origin may not match standards in destination countries. Even if it does, informational barriers may exist, because employers are likely to have limited information or knowledge about the validity of academic or occupational qualifications acquired abroad, reducing the perceived domestic value of those credentials. The imperfect recognition of foreign credentials is a key factor behind the informational barriers that contribute to occupational downgrade of qualified migrants in host countries (Chiswick and Miller 2009). For these reasons, migrants tend to select occupations that differ vertically (that is, they require a lower level of education) or horizontally (that is, they require the same education level but entail distinct types of tasks) from those of native-born workers.

This brain waste comes at a cost for both sending and receiving countries. At the destination, the untapped use of migrants' skills can reduce productivity and tax revenues. For migrants and sending countries, occupational downgrade lowers earnings potential and migrants' subsequent capacity to send remittances back to their origin country. Furthermore, not using certain higher skills during the migration episode can also hinder migrants' ability to use those skills upon return to their home country.

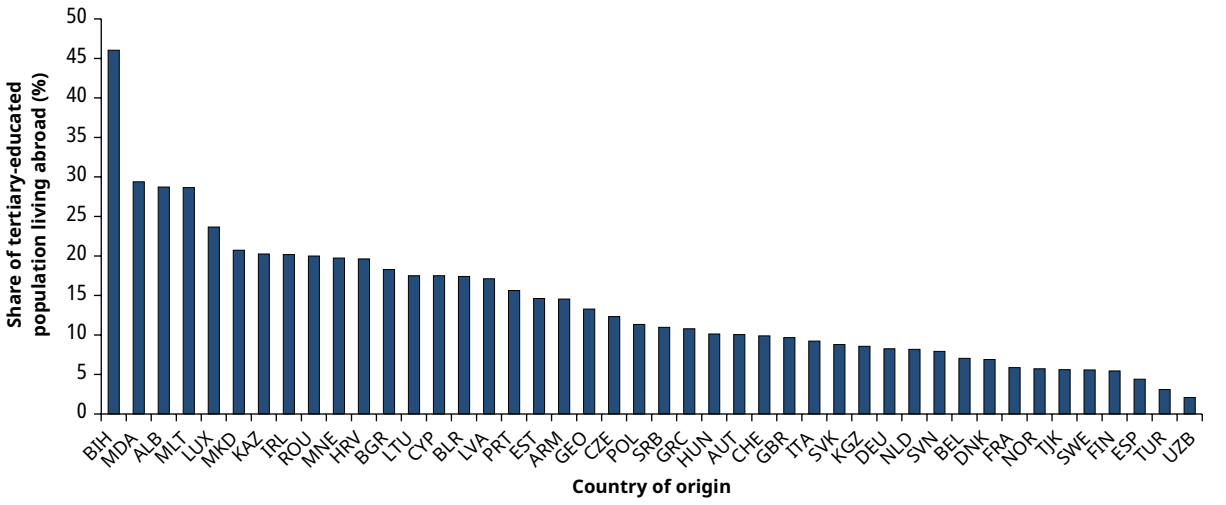
Short-Term Impacts of High-Skilled Emigration on Origin Countries

Human Capital and Labor Market Impacts

High-skilled emigration is widespread in some of the smaller middle-income ECA countries. In smaller countries in the Western Balkans, such as Bosnia and Herzegovina, for example, it is estimated that close to 45 percent of the working-age population with a tertiary degree lives abroad (refer to figure 4.11). Another smaller country in the Western Balkans, Albania, also exhibits very high rates of high-skilled emigration: close to 30 percent of the tertiary-educated working-age population is estimated to live abroad. In Moldova, the incidence of high-skilled emigration is of a similar magnitude. The very high incidence of emigration among high-skilled workers is a source of concern among origin-country policy makers, especially in countries with an aging population. In contrast, in Central Asian countries such as Tajikistan and Uzbekistan, less than 5 percent of the high-skilled population is estimated to live abroad.

FIGURE 4.11

Share of the working-age population with tertiary education living abroad, by country of origin



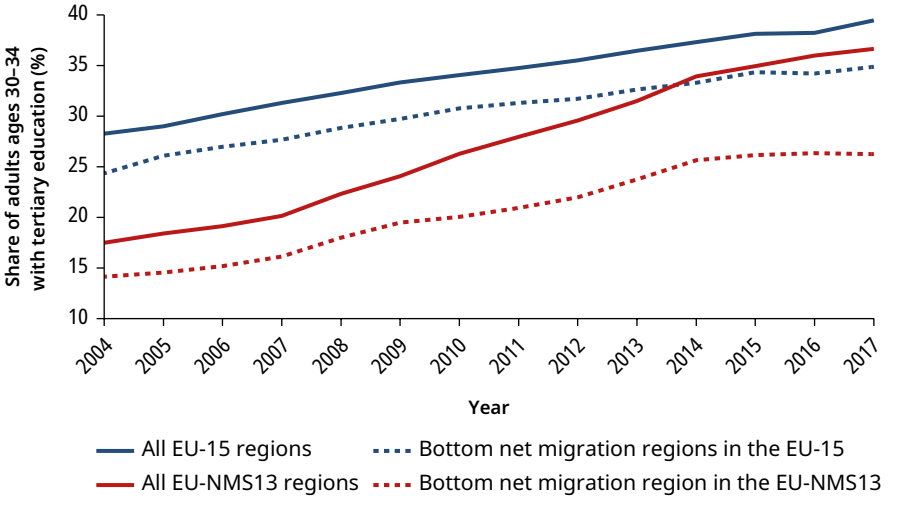
Source: Original calculations based on UN Department of Economic and Social Affairs (https://www.un.org/development/desa/pd/content/international-migrant-stock).
Note: For a list of country codes, go to https://www.iso.org/obp/ui/#search.

In the short run, high-skilled migration can reduce human capital in countries of origin, especially if emigrants are more skilled than nonmigrants. High-skilled migration affects the quantity and quality of labor and human capital available in the country of origin in the short run. The short-term human capital impacts of emigration are more severe if migrants are more skilled than the rest of the population in the origin country. This is the case in most ECA countries of origin. The impacts are more pronounced when emigration is widespread among the working-age population, as in the case of smaller origin countries in the Western Balkans and Central EU (Bossavie and Özden 2023).

Human capital growth and convergence is slower in countries that experience high emigration rates. Educational attainment among the adult population in the European Union has progressively increased since the European Union's enlargement in 2004, and among the EU-NMS13, there has been a process of catching up to the EU-15. This convergence is more visible in the younger population ages 30–34 years (refer to figure 4.12). However, the top migrant-sending regions among the EU-NMS13 have been slower to improve. They have not reached the EU-15 average and have experienced larger gaps relative to the average among populations in the EU-NMS13. Because of this, migration in NMS-sending regions, which usually involves more highly educated populations, seems to slow the convergence in human capital across these regions.

FIGURE 4.12

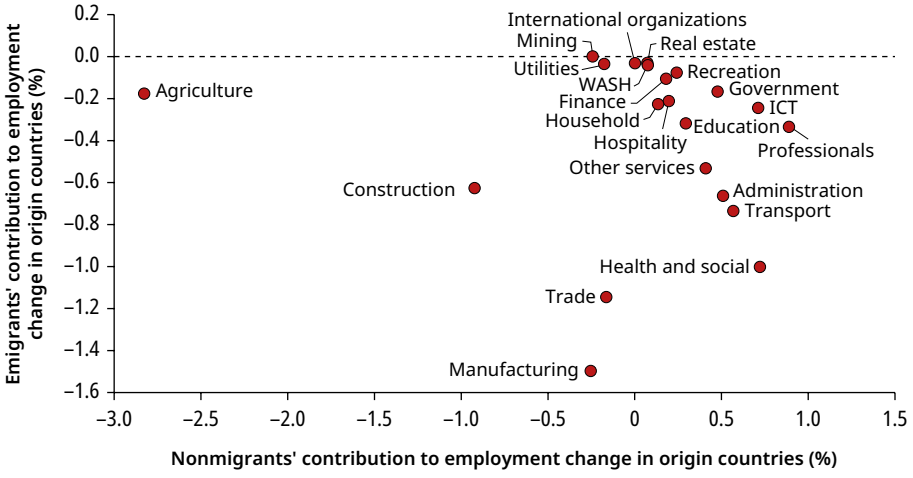
Changes in the share of tertiary-educated individuals (ages 30–34) in high- versus low-emigration regions of the European Union



Source: Bossavie et al. 2022. Elaboration based on data from Education and Training database, Eurostat (https://ec.europa.eu/eurostat/web/education-and-training/overview).
Note: Bottom net migration regions are the bottom 30 percent of total EU-15 and EU-NMS13 NUTS-2 subdivisions with the lowest net inflows of international migrants, calculated as international arrivals minus international departures during the period 2004–18. EU-15 = European Union members before 2004; EU-NMS13 = new member states joining the European Union in 2004, 2007, and 2013; NUTS-2 = Nomenclature of Territorial Units for Statistics level 2.

Without the right policies in place, the departure of high-skilled workers can contribute to labor shortages in countries of origin, including in critical occupations. High-skilled emigrants represent a large share of the total stock of workers in some specific sectors of origin countries, particularly IT and health. As shown in figure 4.13, emigration has been a negative contributor to employment in the health sector among the EU-NMS13. In addition, ICT professionals from the EU-NMS13 who worked in other EU countries represented about 15 percent of the total stock of ICT workers in origin countries. In the health sector, this proportion was close to 20 percent. Emigration of high-skilled professionals can lead to labor shortages in critical occupations, such as medical doctors. This can be especially challenging for countries of origin that experience an increase in the demand for medical services associated with population aging. In the Western Balkans, an analysis of LinkedIn data carried out by LinkedIn and the World Bank suggests that net migration of LinkedIn members during the period 2015–19 was associated with the loss of business and tech skills. The analysis of LinkedIn data also showed a loss of industry-specific skills, such as ICT, engineering, and medical skills (https://linkedindata.worldbank.org/data). A series of reports from the European Training Foundation also point to high

FIGURE 4.13
Changes in employment due to nonmigrants and emigrants, new EU member states, 2008–18



Source: European Union Labour Force Surveys (database), Eurostat (https://ec.europa.eu/eurostat/statistics-explained/index.php/EU_labour_force_survey).
Note: Statistics on the *x* axis are calculated as the change in employment in each sector of activity in the EU-NMS13 between 2008 and 2018, divided by the change in total employment in the EU-NMS13 over the same period. Statistics on the *y* axis are calculated as the change in employment in each sector of activity of migrants from the EU-NMS13 in other EU countries between 2008 and 2018, divided by the change in total employment in the EU-NMS13 over the same period. EU-NMS13 = new member states joining the European Union in 2004, 2007, and 2013; Household = households as employers; ICT = information and communications technology; NUTS-2 = Nomenclature of Territorial Units for Statistics level 2; WASH = water, sanitation, and hygiene.

labor demand and shortages in the ICT sector in the Western Balkans and Central EU (for example, ETF 2021; OECD 2022).

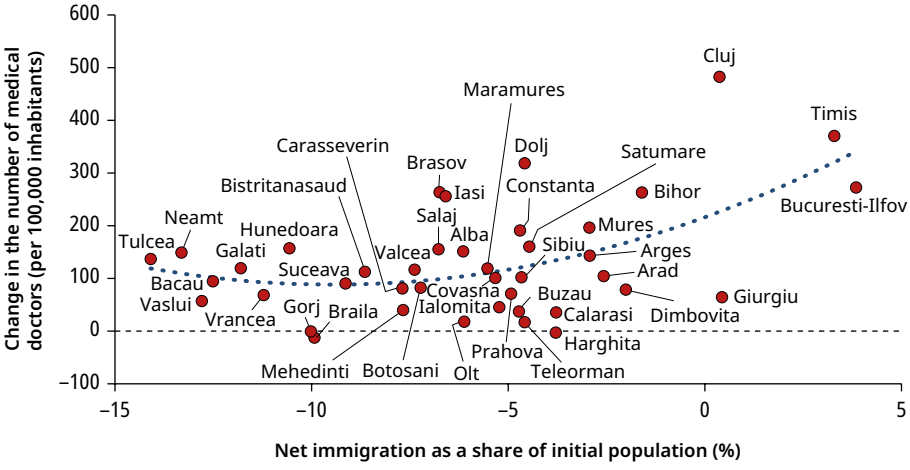
A few studies of ECA countries suggest that high-skilled emigration may negatively affect capital growth, productivity, and innovation in countries of origin. At the theoretical level, it has been shown that the emigration of high-skilled workers may have repercussions on productivity in countries of origin through various channels. First, in the presence of skill complementarities or externalities between high-skilled workers in a firm, the emigration of high-skilled workers may negatively affect productivity among those who stay (Docquier, Lohest, and Marfouk 2007). Second, although it allows innovators at home to access valuable knowledge accumulated abroad, the emigration of high-skilled migrants can also have negative impacts on the rest of the economy by weakening local knowledge networks (Agrawal et al. 2011). In the ECA context, high-skilled emigration has been reported to have negative impacts on firm productivity and total factor productivity in some Central EU countries (Giesing and Laurentsyeva 2018). Third, because of the imperfect substitutability between low-skilled and high-skilled labor, skill-selective emigration can lead to slower capital growth and technological downgrading (Bhagwati and Rodriguez 1975; Docquier and

Rapoport 2012; Haque and Kim 1995; Miyagiwa 1991). Finally, entrepreneurship and innovation may be negatively affected by the departure of young, high-skilled workers: some studies find negative effects of youth emigration on entrepreneurship and innovation in Italy (Anelli et al. 2019).

Because high-skilled migrants mostly come from lower-income regions within ECA, human capital loss and skills shortages may increase gaps between lagging and leading regions. As shown in the "Patterns, Trends, and Heterogeneity in High-Skilled Emigration in Europe and Central Asia" section, high-skilled emigration disproportionately comes from the less economically developed regions of ECA origin countries. This may lead to a vicious circle in which poor economic conditions in some regions lead to emigration, which further degrades economic conditions in those regions. In Romania, beyond the positive trends at the national level, regional analysis shows larger increases in the number of doctors per capita (as well as in the number in other skilled professions, such as engineers) in counties with less net migration outflows, whereas some of the lagging regions with higher outmigration did not see meaningful gains in the supply of doctors (refer to figure 4.14). Available evidence for ECA, however, mostly looks at the association between high-skilled emigration and labor shortages. Much more evidence is needed to establish a causal link.

FIGURE 4.14

Changes in the number of medical doctors per capita in high- and low-emigration regions, Romania, 2002–11



Sources: Ten percent samples of the 2002 and 2011 censuses from Minnesota Population Center Integrated Public Use Microdata Series 2019 (https://www.ipums.org/projects/ipums-international/d020.v7.2).
Note: Net immigration is defined as the number of immigrants (arrivals) minus the number of emigrants (departures) from 2002 to 2011 in each region. Regions listed are the Nomenclature of Territorial Units for Statistics level 3 regions of Romania.

Fiscal Impacts

The departure of high-skilled workers shrinks the fiscal base with potentially negative impacts on public finances. Tax revenues may be reduced because of the lower economic activity resulting from labor outflows (Gibson and McKenzie 2012). Remittances, however, can raise consumption taxes, thereby exerting a mitigating impact. On the expenditure side, the older population left behind puts pressure on pension and health spending (Clements et al. 2015). Fiscal losses become larger if emigrants are concentrated among prime-age, highly educated, and high-earning workers (Desai et al. 2009). In the EU-NMS13, net immigration has been associated with higher social spending on pensions and health care during periods of weaker economic growth (Atoyan et al. 2016). The reduction of the fiscal base is especially a problem in education because nonmigrants must subsidize those who leave.

Medium- and Long-Term Impacts on Origin Countries

Human Capital Impacts

In the medium to long term, countries of origin can experience net gains in human capital if certain conditions are fulfilled. In addition to the immediate short-term drain on human capital associated with emigration, the departure of skilled workers can also lead, eventually, to what has been referred to as brain gain in migrant-sending countries. Brain gain occurs through two main channels: one is by increasing the returns to education and investments in human capital in the origin country, because of the high wage premium associated with the demand for high-skilled employment abroad, and the other is through the return of high-skilled migrants who have accumulated additional human, financial, and social capital while in another country. For instance, the direct effect of the emigration of doctors, which reduces the stock of doctors in ECA sending countries, may be offset by the greater incentives to graduate in medicine because of higher earnings potential in destination countries and the option value of returning from abroad with enhanced skills.

Cross-country studies including ECA countries have reported a net positive association between emigration and human capital accumulation in origin countries, if emigration rates remain moderate. A positive relationship between skilled emigration and skill formation, after accounting for initial human capital levels, has been reported by cross-country studies (Beine, Docquier, and Oden-Defoort 2011; Beine, Docquier, and Rapoport 2008; Docquier, Lohest, and Marfouk 2007). These studies show, however, that this finding holds if emigration rates remain below 20 or 30 percent, depending on countries' characteristics. A similar positive association has

been reported for samples of ECA countries. Among sending countries in the Central EU, return migration, combined with the education incentive channel, has been shown to turn the drain on human capital into a gain (Beine, Docquier, and Rapoport 2001, 2008; Docquier and Rapoport 2012; Mayr and Peri 2009): a 0–20 percent increase in emigration rates, in the long run, has been estimated to increase average schooling by about one year in origin countries in the Central EU (Mayr and Peri 2009). Support for the brain gain hypothesis has also been found in a panel regression estimation for the 10 countries that joined the European Union in the 1980s and 2004 (Farchy 2009). In Romania, temporary emigration was found to have positive long-run effects on skill levels at home (Ambrosini et al. 2015).

Human Capital Investments in Origin Countries in Response to Migration Opportunities

The main mechanism behind human capital gains for countries of origin is the increase in educational investments that takes place in response to emigration opportunities. Recent empirical studies of brain gain outside ECA offer evidence that high-skilled emigration can have net positive effects on the supply of high-skilled labor in origin countries by incentivizing investment in human capital through increased emigration opportunities. Two recent studies of nurses in the Philippines and IT workers in India find that the incentive effect of potential migration on human capital acquisition far outweighs the observed migration (Abarcar and Theoharides 2021; Khanna and Morales 2017). In both cases, the increase in the supply of graduates in response to emigration opportunities has compensated for the departure of high-skilled workers severalfold.

Two main conditions, however, need to be satisfied for a net gain in human capital (brain gain) to materialize. First, migrants' countries of origin must be able to increase educational institutions' capacity to meet the increased demand. Second, there needs to be a large enough number of newly educated individuals who do not emigrate and end up being employed in the country of origin or who return after working abroad.

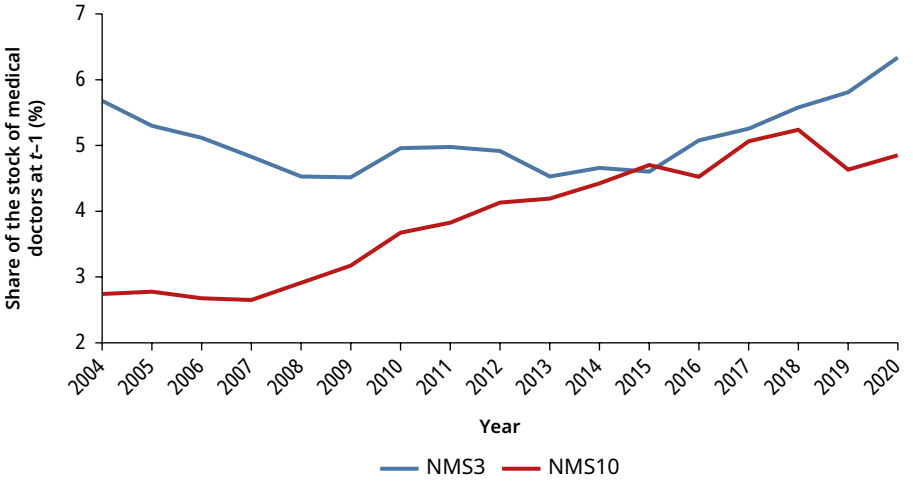
As high-skilled emigration rose, countries of origin in ECA did register an increase in the number of graduates in essential occupations such as doctors. Overall, the stock of doctors in all subregions of ECA has risen over the past 15 years, despite the incidence of the emigration of doctors in some countries of origin in the subregion. In fact, the supply of new graduates has increased more rapidly in ECA origin countries that experienced higher emigration rates. Although the size of the cohort of new graduates in medicine was close to constant in the northern EU-15 countries between 2004 and 2016, the number of new graduates in

medicine showed an upward trend in the EU-NMS13, especially during the first five or six years after EU accession (refer to figure 4.15). In the 10 new member states that completed formal EU accession in 2004 (Cyprus, Czechia, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovak Republic, and Slovenia), the size of the cohort of graduates in medicine accelerated in 2009. In the three member states that entered the European Union in 2007 (Bulgaria and Romania) and 2013 (Croatia), graduate flows accelerated beginning in 2013.

In a few ECA origin countries, the increase in the number of new medical graduates was large enough to compensate for emigration in high-skilled occupations, but not in others. In Romania, the increase in medical graduates in response to emigration was high enough that the emigration of high-skilled doctors did not hamper the catching-up process with other countries. The number of graduates in medicine increased after Romania's EU accession in 2007 and accelerated for six years after that, a period in line with the length of time it takes to complete medical school programs (refer to figure 4.16). In fact, the ratio of doctors vis-à-vis the EU average increased from 66 percent in 2000 to 82 percent in 2018. Although other factors might be at play, the fact that most of the increase in medical graduates in Romania stems from programs in English and French is

FIGURE 4.15

New graduates in medicine, member states entering the European Union in 2004, 2007, and 2013

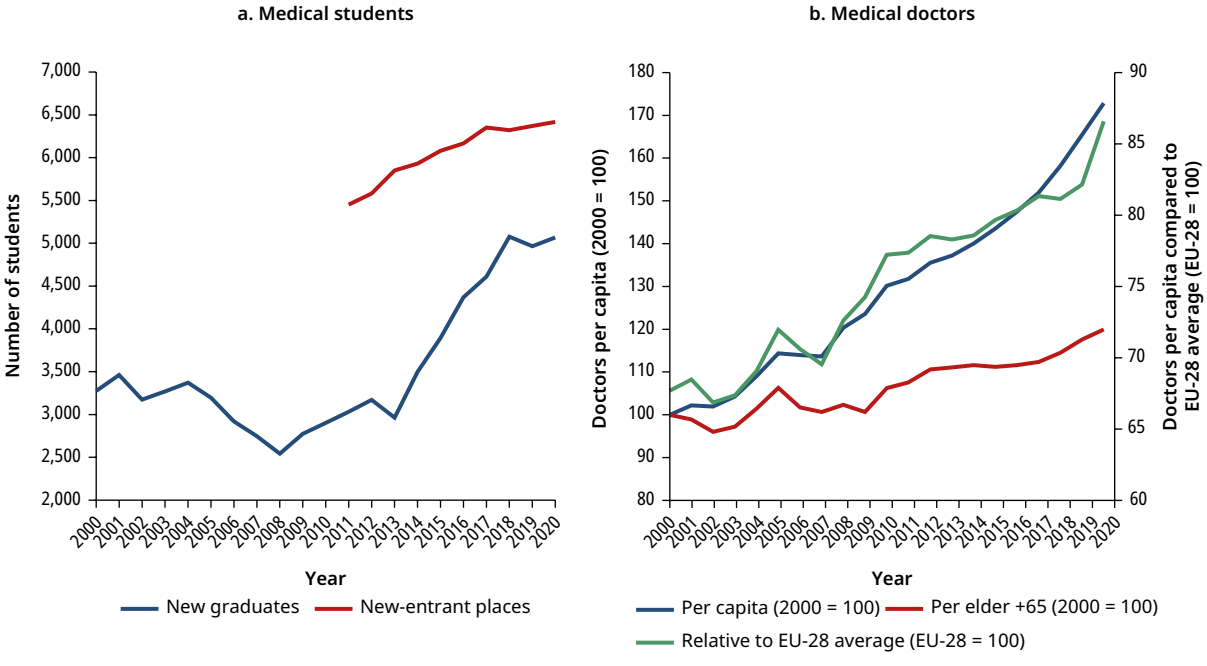


Source: European Commission Regulated Professions Database (https://ec.europa.eu/growth/tools-databases/regprof/index.cfm?action=homepage).
Note: On the *y* axis, *t*–1 refers to the year immediately before the one reported on the *x* axis. The blue line shows the trends for the share of doctors after EU accession in NMS10 countries, and the red line shows the trend for NMS3 countries. EU = European Union; NMS10 = new member states that completed formal EU accession in 2004 (Cyprus, Czechia, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovak Republic, and Slovenia); NMS3 = new member states that completed formal EU accession in 2007 (Bulgaria and Romania) and 2013 (Croatia).

consistent with increased investment in education in response to higher demand for internationally transferable skills. Other migrant-sending countries, such as Czechia and Slovenia, also witnessed a rapid rise in the number of graduates in medicine that more than compensated for the emigration of doctors. In other countries, however, the change in the number of high-skilled graduates did not compensate for the emigration of high-skilled workers. In Estonia, Hungary, and Latvia, for example, the additional supply of new graduates was not sufficient to make up for the departure of human resources (refer to figure 4.17 for a comparison of Hungary and Romania).

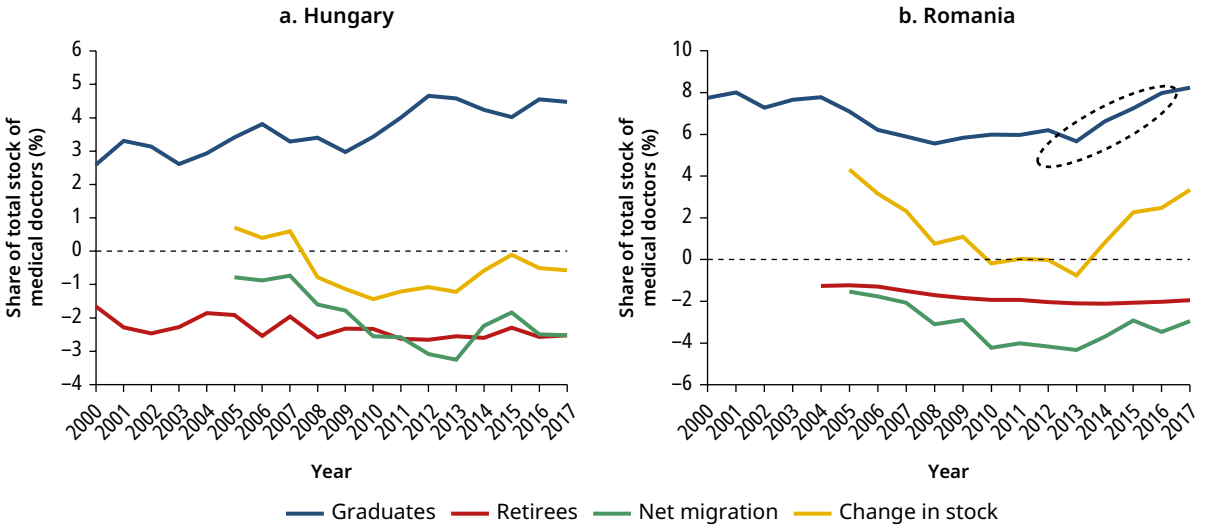
The heterogeneity of experiences among ECA countries suggests that policies and local contexts are key in determining whether origin countries' supply of high-skilled workers increases in the face of migration opportunities. One determinant of the net gains in human capital from high-skilled emigration is the ability of the educational

FIGURE 4.16
Supply of medical students and stock of medical doctors, Romania, 2000–20



Sources: Health graduates: Eurostat (https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=hlth_rs_grd&lang=en); stock of doctors: health personnel by NUTS-2 regions, Eurostat (https://ec.europa.eu/eurostat/en/web/products-datasets/-/HLTH_RS_PRSRG); new-entrant places: Ungureanu and Socha-Dietrich 2019; population: Eurostat Population database, reference years 2013, 2018, population on January 1, by age group, and sex (https://ec.europa.eu/eurostat/web/population/overview).
Note: New-entrant places refers to the number of students who start studying medicine. On the left-hand *y* axis of panel b, the number of doctors per capita per year is reported relative to the number of doctors per capita in 2000, where the reference value in 2000 is 100 (2000 = 100). On the right-hand *y* axis of panel b, the number of doctors per capita in Romania per year is reported relative to the average number of doctors per capita in the EU-28 in the same year, where the reference value for the EU-28 average is normalized to 100 (EU-28 = 100). NUTS-2 = Nomenclature of Territorial Units for Statistics level 2.

FIGURE 4.17
Changes in the stock of medical doctors, Hungary and Romania, 2000–17



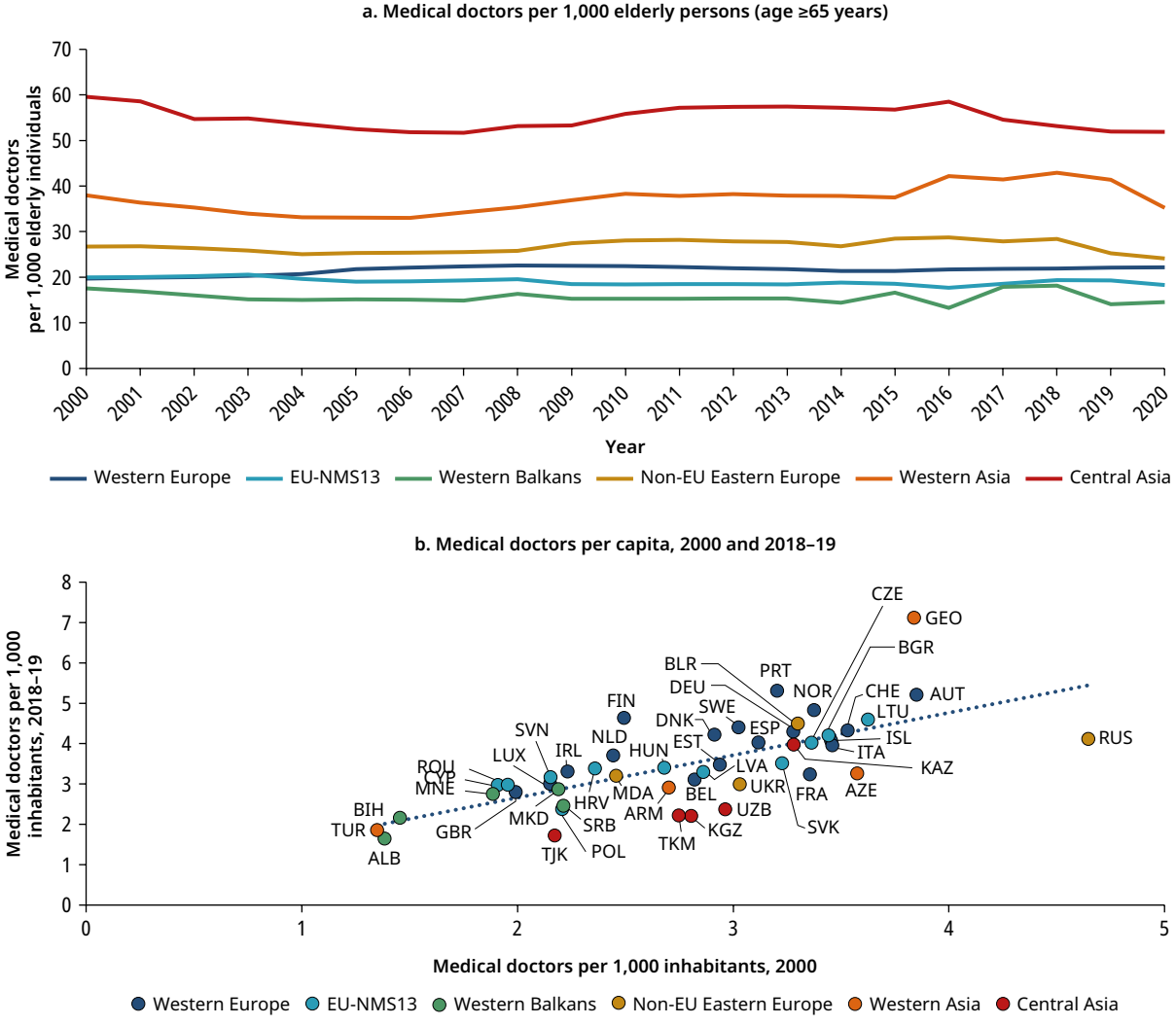
Source: Bossavie et al. 2022, based on Regulated Professions Database, European Commission (https://ec.europa.eu/growth/tools-databases/regprof/index.cfm?action=homepage).
Note: Net migration is defined as the difference between immigration flows (arrivals) and emigration flows (departures) in each European region. The dashed oval in panel b highlights the increase in the number of new graduates as a share of the total stock of doctors six years after Romania's accession to the European Union.

system to respond quickly by increasing the supply of high-skilled graduates. This is not always possible. For example, one distinct feature of the educational system for high-skilled health professionals such as doctors is that the number of places in education institutions in these fields of study is often capped (the so-called *numerus clausus*). In addition, for the educational system to be able to rapidly respond, it needs not only to be flexible but also to receive timely and precise information on the demand for high-skilled professionals domestically and abroad. Such careful monitoring of demand for high-skilled workers is only available in a handful of countries.

Even with an increase in the domestic supply of skilled workers, it may be difficult for countries of origin to perceive high-skilled emigration as brain gain because of other ongoing demographic trends. One key example is the increase in the supply of medical graduates in response to migration opportunities, in the context of an aging population. Even if the total stock of doctors has increased in ECA origin countries, descriptive evidence suggests that the increased supply has not caught up with the larger demand, which stems from population aging and the related increased demand for health care services. The number of doctors measured against the size of the older population (those age 65 and older) can approximate these demand pressures. The share of doctors in the EU-15 has dropped by

3.7 percent since 2011, from 1,982 doctors per 100,000 elderly population to 1,909 doctors (refer to figure 4.18, panel a). This shortage may represent a pull factor that attracts doctors and other health care professionals from elsewhere in Europe. In the EU-NMS13, the ratio of doctors per 100,000 elderly population has fallen even more, by more than 13 percent since the 2004 EU accession and by 8 percent since 2011. Thus, although the stock of doctors in the EU-NMS13 has risen despite the migration outflow to

FIGURE 4.18
Stock of medical doctors over time, Europe and Central Asia



Sources: World Development Indicators database, World Bank (https://databank.worldbank.org/source/world-development-indicators); World Health Organization (https://www.who.int/data/gho/data/indicators).
Note: EU-NMS13 = new member states joining the European Union in 2004, 2007, and 2013; Western Europe = Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Liechtenstein, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and United Kingdom; Non-EU Eastern Europe = Belarus, Moldova, Russian Federation, and Ukraine; Western Asia = Armenia, Azerbaijan, Georgia, and Türkiye.

higher-income European countries, the expansion in supply has not kept up with the aging of the population and the consequent increase in the demand for health care services. As shown in figure 4.18, panel b, disparities in the number of doctors per capita have increased in ECA: net emigration countries such as Albania and Latvia or Central Asia have lower ratios than in 2000.

Human Capital Gains through Return Migration

Origin countries can also benefit from high-skilled migration through the return of their high-skilled migrant workers. When high-skilled emigration is only temporary, returning migrants can bring back productive skills that benefit the home economy (Borjas and Bratsberg 1996; Dustmann, Fadlon, and Weiss 2011; Dustmann and Weiss 2007). This can create a positive effect even with initial emigration (Dos Santos and Postel-Vinay 2003).

In addition to increasing the productivity of return migrants, temporary migration may increase the human capital and productivity of nonmigrants through knowledge transfers. Return migration can have an expansionary effect through knowledge diffusion that in turn narrows the technological gap between the host and source countries (Dos Santos and Postel-Vinay 2003). Evidence of such knowledge spillovers is scarce, although recent evidence shows that return migration from Germany to the former Yugoslavia after the end of the Balkan war led to significant productivity and export gains in workers' home countries (Bahar et al. 2022). Emerging evidence for outside ECA also shows that more return migration increases knowledge diffusion and human capital in the sending country (Choudhury 2016). However, more evidence specific to the ECA context is required to generalize those findings.

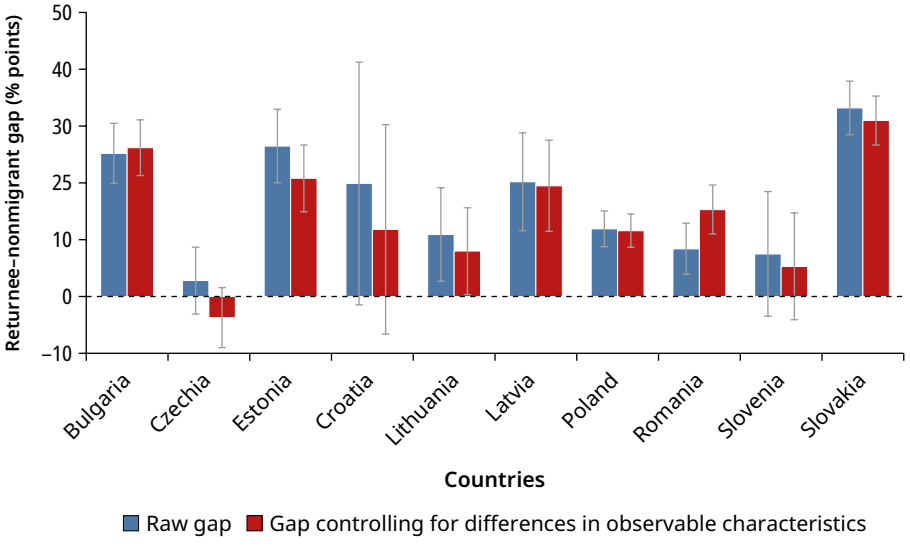
Most studies for ECA find that, compared with nonmigrants, high-skilled migrants experience wage gains upon their return, suggesting that the migration experience increases productivity in home labor markets. Among those who return to their home countries, migrants from the EU-NMS13 earn higher wages when they have a salaried job and are more likely to become self-employed than nonmigrants, generating new activities and potentially creating more jobs (Piracha and Vadean, 2010). Several studies find that returning migrants in ECA earn a positive wage premium.[2] Results show substantive income premiums for return migrants, ranging from 40 percent in Hungary (Co, Gang, and Yun 2000), to 10–45 percent in a selected group of EU new member states including Romania (Martin and Radu 2010), to almost 100 percent in Albania (de Coulon and Piracha 2005). Data from the EU Labour Force Survey ad hoc module for 2014 (https://ec.europa.eu/eurostat/data/database?node_code=lfso_14) show that in 2014 Romanian return migrants were 15 percent more likely to be in the top three percentiles

of income, controlling for observable characteristics such as age, marital status, gender, education level, and NUTS-2 region of residence. Figure 4.19 shows that in most countries from the EU-NMS13, return migrants who are wage workers are more likely than nonmigrants to be among the top earners, even after controlling for systematic differences in observable characteristics. Such gains may originate from actual productivity increases due to human capital accumulation abroad and from the signaling effects to employers in origin countries of having worked abroad (Reinhold and Thom 2013). A related, albeit scarcer, literature examines whether migrants who return to their country of origin improve their labor market outcomes in addition to experiencing wage gains. In Albania, high-skilled returning migrants have been found to experience upward occupational mobility compared with nonmigrants (Carletto and Kilic 2011).

The human capital benefits of the migration experience for high-skilled migrants and countries of origin depend on multiple factors that are affected by policies in both sending and origin countries. These factors include migrants' educational level, whether the work experience and human capital gained at destination countries are in demand in the home

FIGURE 4.19

Difference in the share of returnees and nonmigrants in the top three earnings deciles, EU-NMS13



Source: Bossavie et al. 2022, based on EU Labour Force Survey, Ad Hoc Module, "2014 Labor Market Situation of Migrants and Their Immediate Descendants," Eurostat (https://ec.europa.eu/eurostat/data/database?node_code=lfso_14).
Note: Returnees are defined as working-age individuals who lived abroad in the past. Raw (unconditional) gaps are based on differences in means of returnees compared with stayers with no controls. The gaps with controls are the beta coefficients of a Logit regression where a binary variable for being in the top three income deciles nationwide (outcome variable) is regressed on a binary variable for being a return migrant (explanatory variable), controlling for age, gender, education, and region of resettlement. Error bars represent 95 percent confidence intervals. For a list of country codes, go to https://www.iso.org/obp/ui/#search.

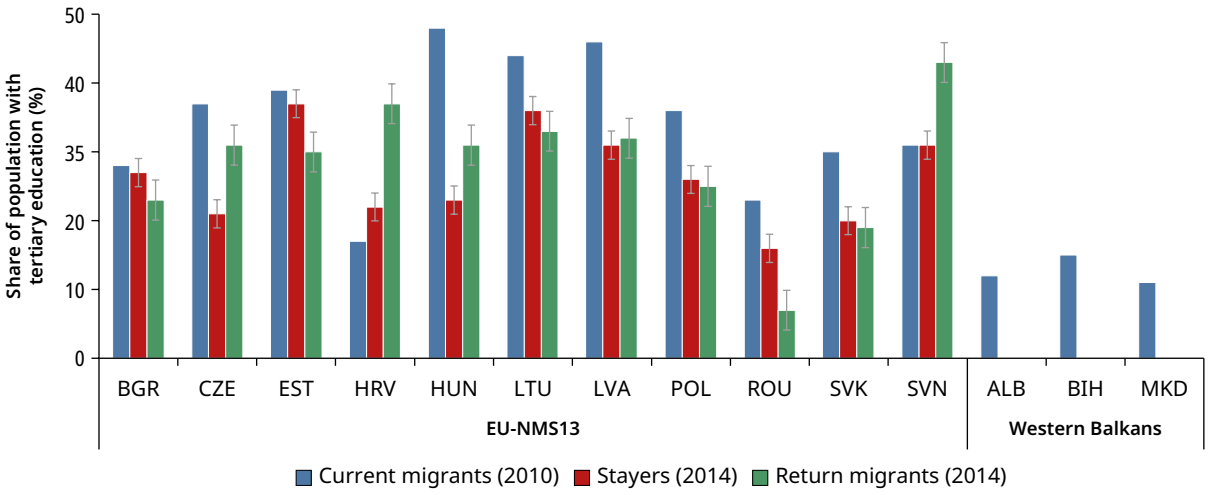
labor market, and whether the duration of stay abroad was long enough for human capital accumulation (Bossavie and Özden 2023). One emerging consensus from the empirical literature, which includes ECA countries, is that higher-skilled temporary migrants experience greater human capital, productivity, and wage gains from the migration experience than low-skilled migrants (Ambrosini et al. 2015; Gibson, McKenzie, and Stillman 2011; McCormick and Wahba 2001; Wahba 2015).[3] The duration of the stay abroad has also been shown to matter in the context of return migration to Romania (Shima 2010). Migrants who stay abroad longer have more time to accumulate human capital, but the value of the skills gained depreciates if they are not used. Human capital gains also depend on whether there is a match in the home labor market for the human capital gained by returning migrants (Dustmann, Fadlon, and Weiss 2011; Mayr and Peri 2009). If the human capital accumulated while abroad is not in demand, skill waste can take place, along with inactivity, as found for migrants returning to Poland (Coniglio and Brzozowski 2018). Finally, temporary migrants' destination countries may matter in whether there are benefits of return migration for migrants and their home economy (Dustmann, Fadlon, and Weiss 2011), as shown in Albania (Carletto and Kilic 2011).

The human capital benefits of migration for countries of origin also depend on who returns among workers who went abroad. Migrants who choose to return to their country of origin may either be more skilled and successful than those who choose to stay abroad (positive selection in return migration) or vice versa (negative selection in return migration).[4] A few studies have examined this question for ECA countries and report mixed findings. In the case of immigrants to the Netherlands, a U-shaped relationship between return intensity and migrants' income abroad is observed. Returns are more common among very low-income migrants and high-income migrants than among middle-income ones (Bijwaard, Schluter, and Wahba 2014). In the case of immigrants in Germany, higher wages have been shown to lead to more and faster returns (Dustmann 2003). From the perspective of sending countries, return migrants to the EU-NMS13 are negatively selected on education compared with current migrants and nonmigrants in almost all countries, except for Croatia and Slovenia (refer to figure 4.20), where return migrants are more likely than nonmigrants and current migrants to have some tertiary education.

High-skilled migration to the European Union exhibits a high degree of circularity overall, but countries in the EU-NMS13 and the Western Balkans struggle to attract their qualified emigrants back. High-skilled emigrants within the European Union are significantly more likely than low-skilled migrants to return to their home country within five years (refer to figure 4.21). There is, however, a great deal of heterogeneity depending on

FIGURE 4.20

Share of the working-age population (ages 25–64) with tertiary education, by migration status



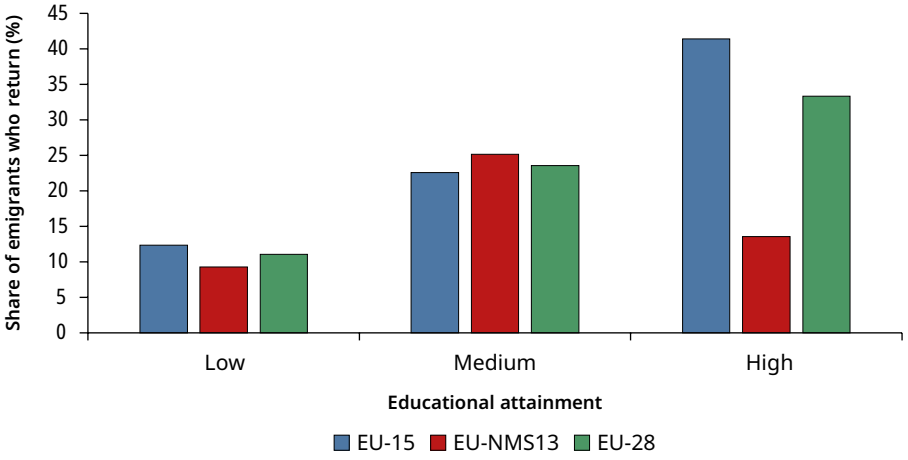
Sources: EU Labour Force Survey (database), Eurostat (https://ec.europa.eu/eurostat/statistics-explained/index.php/EU_labour_force_survey); Organisation for Economic Co-operation and Development Database on Immigrants in OECD and Non-OECD Countries (https://www.oecd.org/els/mig/dioc.htm).

Note: Current migrants are defined as working-age individuals who are currently absent from their household for work abroad the time of the survey. Return migrants are defined as working-age individuals who have returned to their household from abroad during the past five years. Stayers are defined as individuals who are neither current migrants nor return migrants. Error bars represent 95 percent confidence intervals. For a list of country codes, go to https://www.iso.org/obp/ui/#search. EU-NMS13 = new member states joining the European Union in 2004, 2007, and 2013.

the high-skilled migrants' region of origin. Among high-skilled migrants from the EU-15 who were abroad in 2010, 40 percent had returned to their home country five years later. In contrast, countries of the EU-NMS13 face significantly more difficulties in attracting back their migrants, and it is estimated that after five years, only 12 percent of their high-skilled migrants return home. One possible explanation is the persistence of economic challenges and push factors that led skilled migrants to move out of the country in the first place. Return rates are particularly low among high-skilled migrants from the EU-NMS13 who moved to non-EU OECD countries, such as Australia, Canada, and the United States. In the Western Balkans, recent analyses of net migration flow by educational attainment in the period 2010–19 reveal some differences across countries of origin (Leitner 2021). The results indicate a net outflow of highly skilled migrants with little evidence of return to Albania, Bosnia and Herzegovina, and Kosovo, whereas Montenegro, North Macedonia, and Serbia experienced positive net migration among those with the highest skill levels, especially among the younger cohorts. The findings indicate that return migration in the form of students returning home after acquiring university education abroad is taking place in Montenegro, North Macedonia, and Serbia (Leitner 2021).

FIGURE 4.21

Estimated share of international migrants to the European Union who return home, by educational attainment and region of origin



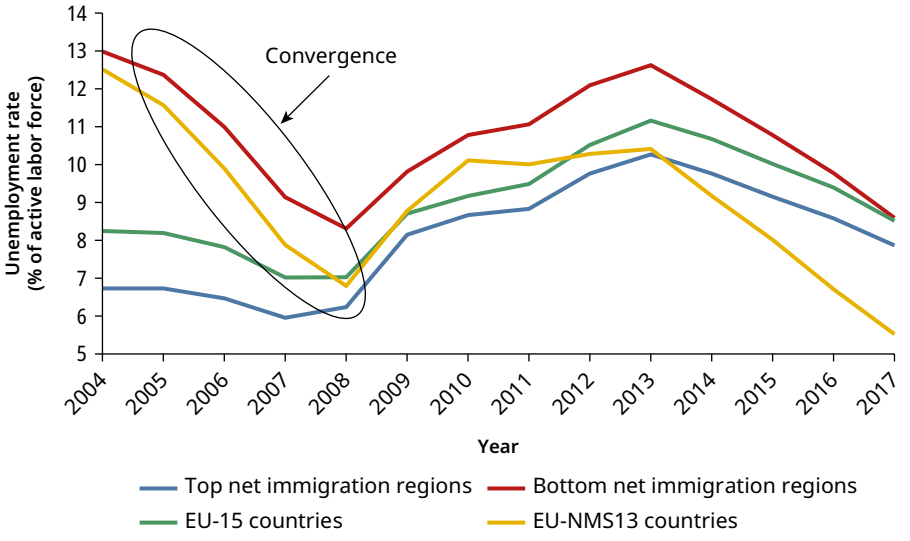
Sources: Adapted from Bossavie et al. 2022. Estimates based on data from the Centre d'Etudes Prospectives et d'Informations Internationales GeoDist Database (http://www.cepii.fr/CEPII/en/bdd_modele/presentation.asp?id=6); Organisation for Economic Co-operation and Development Database on Immigrants in OECD and Non-OECD Countries, reference years 2010 and 2011 (https://www.oecd.org/els/mig/dioc.htm); and EU Union Labour Force Survey, Ad Hoc Module, "2014 Labor Market Situation of Migrants and Their Immediate Descendants," Eurostat (https://ec.europa.eu/eurostat/data/database?node_code=lfso_14).

Note: Return rates are estimated by dividing by the number of returnees in 2014 by the stock of migrants in 2010, multiplied by the elasticity of returnees to migrants derived from a gravity-type equation that controls for a set of geographic and social ties between the sending and receiving countries (distance, contiguity, share of common ethnic groups). Low educational attainment refers to those with less than upper-secondary education; medium educational attainment, to those with upper-secondary education; and high educational attainment, to those with tertiary education. Returnee rates are estimated by dividing the number of returnees in 2014 by the stock of migrants in 2010 and multiplying by the elasticity of returnees to migrants (the percentage change in returnees for a 1 percent change in the number of migrants), which is derived from a gravity-type equation that controls for a set of geographical and social ties between the sending and receiving countries, including distance, contiguity, and share of common ethnic groups. EU-15 = European Union members before 2004; EU-NMS13 = new member states joining the European Union in 2004, 2007, and 2013.

Labor Market Impacts

High-skilled emigration can alleviate unemployment pressures in sending regions with scant job opportunities, especially among the tertiary-educated youth. By design, high-skilled emigration reduces pressures on origin countries' labor markets by providing employment opportunities outside the domestic labor market. This can particularly benefit the youth population, for whom the transition from the educational system to the labor market can be problematic, especially in contexts in which domestic labor demand is lagging. Descriptive evidence in the EU reported in figure 4.22 is consistent with this phenomenon: before the 2008–09 global financial crisis, migration from high- to low-unemployment areas coincided with a substantial decline in unemployment in the top migrant-sending countries.

FIGURE 4.22
Relationship between emigration and unemployment, EU origin countries



Sources: Bossavie et al. 2022, based on data from the EU Union Labour Force Survey (database), Eurostat (https://ec.europa.eu/eurostat/statistics-explained/index.php/EU_labour_force_survey); Eurostat Population database (https://ec.europa.eu/eurostat/web/population/overview).
Note: Top net immigration and emigration areas are the top 30 percent of NUTS-2 country administrative subdivisions with the highest migrant inflows minus outflows and outflows minus inflows, respectively, during 2004–17. EU-15 = European Union members before 2004; EU-NMS13 = new member states joining the European Union in 2004, 2007, and 2013; NUTS-2 = Nomenclature of Territorial Units for Statistics level 2.

Similarly, the period that followed the EU enlargement was accompanied by a much steeper decline in unemployment in top migrant-sending countries in the European Union than in top receiving countries, especially among the EU-NMS13. Although this evidence should be interpreted as descriptive and may also have been driven by other economic factors associated with EU enlargement, it is compatible with the hypothesis that high-skilled emigration helps alleviate pressures in home labor markets.[5]

The effects of emigration on wages in origin countries' labor markets are small. In Lithuania and Poland (Dustmann, Frattini, and Rosso 2015; Elsner 2013), emigration was found to have a positive effect on wages of workers in the home country who have skills like those of the workers who emigrated, because of reduced competition. Also, emigration has been found to have negative effects on the wages of less-educated native-born workers who have skills that complement those of high-skilled emigrants (Docquier, Ozden, and Peri 2014; Dustmann, Frattini, and Rosso 2015). It is important to note, however, that across the board, the magnitude of these impacts is small; in addition, the other two opposite forces at play in

equilibrium wages—aging of the native-born population and upskilling—have more than compensated for any negative effects of emigration on the wages of native-born workers in migrant-sending countries (Docquier et al. 2019).[6]

Spillovers from the Diaspora of High-Skilled Workers to Origin Countries

The most direct and tangible impact of the diaspora of highly skilled workers on countries of origin is through remittances sent back home. High-skilled migrants typically send remittances back home, especially if they moved abroad without the rest of their household with the intention of returning home (Bossavie and Özden 2023). Although remittances have immediate impacts on the welfare of household members left behind, they can also produce a range of indirect effects in countries of origin. These effects include increased investments in education and health by households left behind, an easing of financial constraints, and increased entrepreneurship. Remittances can help countries of origin and households mitigate the impacts of negative shocks because they are not affected by business fluctuations in countries of origin and have been shown to increase during economic downturns.[7] At the macro level, they can support macroeconomic stability by producing a more stable source of foreign exchange compared with more volatile financial flows such as foreign direct investment (FDI) or official development assistance.

The presence of high-skilled migrants abroad can help increase the transfer of knowledge and technology to and support trade with and financial investments in countries of origin. Evidence suggests that emigrants, especially those who are highly skilled, keep a wide range of professional ties to their native countries (Docquier and Lodigiani 2010; Saxenian 2002; Wescott and Brinkerhoff 2006). As such, skilled migrants can help ease information imperfections by reducing information asymmetries and creating trust among parties (Kerr 2008). Evidence for knowledge and technology diffusion linked to emigration has been reported for ECA in the context of migration from the former Yugoslavia to Germany (Bahar et al. 2022). The reduction in information asymmetries and transaction costs can also benefit trade. Empirically, a growing literature, although not specific to ECA, has reported a strong positive relationship between the size of the migrant community and trade with countries of origin (Genc et al. 2012; Gould 1994; Head and Ries 1998). The reduction in transaction costs enabled by the diaspora can also help raise international investments in countries of origin. Skilled migration has been shown to be associated with future increases in FDI inflows due to the formation of business networks (Kugler and Rapoport 2007).

The relationship between FDI and migration has been reported to be stronger for migrants with tertiary education than for less-educated migrants (Javorcik et al. 2011). Although most of the evidence on migration and FDI is from contexts outside ECA, similar impacts from diasporas are expected in ECA given the existence of informational barriers and transaction costs associated with FDI, especially for countries outside the European Union.

Beyond economic impacts, diasporas can also affect institutions and governance in migrant-sending countries. Diaspora networks can have an effect that is not purely economic but is also cultural, through migrants' transfers of behavioral and cultural norms to their home communities, which have been referred to as "social remittances" (Rapoport 2019). While abroad, migrants absorb added information and are exposed to new attitudes, preferences, and practices that can spill over to their home communities through contacts with relatives, friends, and other members of social networks. These social remittances include political values, fertility norms, religious attitudes, and practices. It has been shown, for example, that migrants to more democratic societies can affect social, economic, and political institutions in their home country (Docquier et al. 2016; Spilimbergo 2009). In Moldova, for instance, the emigration wave that started in the aftermath of the 1998 crisis in Russia has been argued to have affected electoral outcomes and political preferences during the following decade, eventually contributing to the fall of the last Communist government in Europe (Barsbai et al. 2017). In contrast, cross-country studies that include ECA countries have suggested that emigration may have a determinantal effect on institutional quality in countries of origin, especially on corruption (Abdih et al. 2012).

Policy Recommendations

This section builds on the evidence gathered in previous sections to propose policy solutions to increase the benefits and reduce the costs of high-skilled emigration for sending countries. It first examines policies that can help reduce incentives to emigrate among the high-skilled population, such as addressing bottlenecks in domestic labor markets and broader improvements in institutions, governance, or public services. It then proposes policies, particularly within the realm of education financing, skills monitoring, and bilateral agreements, to better distribute the costs of high-skilled migration between origin and destination countries. Finally, it focuses on policies to increase the benefits of the high-skilled migration experience for migrants themselves, origin countries, and destination countries.

Reducing the Strength of Push Factors to Emigrating

Despite the gains that high-skilled emigration can generate for countries of origin, those that would like to reduce it must address its root causes. This willingness to reduce emigration flows may be strong in countries that experience high emigration rates among their high-skilled population, as observed in smaller origin countries in the Western Balkans. As highlighted in previous sections, high-skilled migration flows within ECA are mainly driven by disparities in economic opportunities and broader living standards—including access to public services—and governance. Although some of these conditions are structural and can only be altered in the medium to long term, some policies can be implemented in the short term to reduce bottlenecks in domestic labor markets, the business environment, and access to public services.

Addressing bottlenecks in domestic labor markets can increase the attractiveness of home economies, reducing the push and pull factors to emigrate. Overall, policies that can help make the domestic labor market more attractive and efficient—especially for the youth who have a higher propensity to emigrate—can help reduce the strength of push and pull factors. Such policies and programs include traditional labor market policies, such as support to entrepreneurship; active labor market policies, including wage subsidy programs, training, and labor market intermediation; and changes in labor regulations that may discourage employment. These supply-side measures can be complemented by broader demand-side policies that affect the labor market and employment creation, such as measures to improve the broader business and macroeconomic environment, or the tax and benefit system.[8]

Strengthening home institutions, public services, and governance may also reduce incentives to emigrate. Countries addressing corruption in both public and private spheres and investing in improving the quality of governance and public institutions might be able to reduce, directly or indirectly, the extent of brain drain (Bernini et al. 2024). In addition, the provision of quality public services, primarily through greater investment in health and education services, may also increase incentives for highly skilled workers and their families to remain in their home country. In the short run, policies to increase access to services can include targeted housing subsidies during the first years of these workers' career (especially young couples) and increasing the quantity and quality of childcare services. In addition to reducing incentives to emigrate, improvements in local labor market conditions, governance, and access to public services may also incentivize the return of high-skilled migrants.

Reducing the Costs of High-Skilled Emigration for Sending Countries

Reform in graduate education financing, together with cost-sharing arrangements between origin and destination countries, can help mitigate fiscal losses associated with graduates' emigration. Several education financing options have been proposed to help better distribute the cost of education of high-skilled migrant workers among origin countries, destination countries, and migrants. Such measures include the introduction of a graduate tax, according to which graduates would be required to pay part of their taxes to the origin country where they received their education, regardless of their current residence (Poutvaara 2008). As an alternative, income-contingent loans (ICLs), which would be collected from migrant graduates, could also support that objective.[9] By making ICL loan repayments feasible and tax deductible in destination countries, such programs would imply that destination countries would refund some of the education expenditures of the sending countries on the human capital that has been lost (Poutvaara 2004). The implementation of such ICL schemes or graduate taxes would require formal education cost-sharing arrangements between sending and receiving countries, for example, in the context of the European Union's unique labor market. As an alternative, in the absence of bilateral agreements allowing the repayment of ICLs in receiving countries, ICLs should involve regular annuity payments if beneficiaries are residing abroad (Chapman and Higgins 2013). Such potential reforms in education financing, however, should be very carefully considered against their potential effects on incentives to invest in education and broader human capital development in countries of origin.

Establishing or strengthening skills monitoring systems, together with tracking emigration flows, is essential to ensuring a timely response to external and internal demand for high-skilled workers. Better emigration and skills management must start with the collection of data on emigrants' skills and educational profile at the time of departure and by putting in place adequate skills monitoring systems to track the demand and supply of skills and anticipate shortages, especially in critical occupations. Such skills monitoring systems are being implemented in Czechia and Sweden, where a comprehensive labor market information system produces data on skills and jobs in demand in different regions and industries, allowing the detection of potential shortages of skilled workers. Such initiatives, however, remain rare in middle-income countries where high-skilled emigration is widespread. Among countries in the Western Balkans, for example, only the State Statistical Office of North Macedonia publishes information on annual emigration flows (OECD 2022). Even among origin countries that record emigration flows, the skills and occupational profiles of emigrants are typically not available. In North Macedonia, the Ministry of

Education and Science has sought to establish a Skills Observatory, and the Ministry of Labor and Social Policy runs econometric models for skills forecasting. However, the potential of the two initiatives remains to be fully realized, because skills needs and mismatches have not been thoroughly analyzed in the context of migration (OECD 2022).

Once skill needs have been identified, addressing constraints to the supply expansion of high-skilled graduates is crucial. Improvements in the quantity and quality of the provision of skills are essential to preventing labor shortages and harnessing the incentivizing effects of migration on human capital accumulation. Domestic educational systems need to be flexible enough to rapidly respond to increased demand for skilled labor, either domestically or externally. Efforts to respond to skill demand can be made at both the intensive margin (by enhancing the capacity of schools and universities) and the extensive margin (by establishing new education centers). Rigid training systems for certain occupations—such as highly regulated systems based on narrow entry criteria or a small, fixed number of places in medical education—are not necessarily aligned with the needs created by changes in internal or international demand for these occupations. In contrast, education systems without quota systems or with quotas that may be readily adjusted to account for shifts in demand are likely to be able to respond more quickly to prevent potential shortages associated with emigration.

If educational systems cannot expand skill supply in a timely manner, opening domestic labor markets to non-ECA countries in select occupations where skill shortages are anticipated can help in importing needed skills. Immigration in response to emigration is already a rising phenomenon in parts of EU-NMS13, especially among citizens of non-EU Eastern European countries. Poland, which has traditionally been a migrant-sending country, is increasingly turning into an immigration hub within the European Union, to compensate for the emigration of its high-skilled workers (Bossavie et al. 2023). One way to boost immigration is by promoting bilateral labor agreements and by easing the hiring of foreign workers among companies in sectors with rising labor demand. The economic benefits of relying on immigration flows to address domestic labor shortages, however, must be considered within the broader sociopolitical environment of each country, weighted against potential political backlash.

Enhancing the Benefits of the Migration Experience for High-Skilled Migrants, Origin Countries, and Destination Countries

Strengthening ongoing efforts to certify foreign credentials across ECA can enhance the mobility of high-skilled workers and increase the benefits of

the migration experience for all actors. To reduce occupational downgrade, countries of origin need to adjust education and training curricula to international standards. This can help ensure that the quality of education and productivity levels of graduates in each occupation are comparable to those in destination countries. Once this is achieved, extending skills recognition systems through close collaboration between origin and destination countries can also help reassure employers about the productivity of foreign graduates. Institutionalized cooperation between vocational education and training schools and universities in countries of origin and public employment agencies in destination countries is also key to extending skills recognition systems (OECD 2022).

Multilateral migration arrangements can serve as an institutional base to enhance the benefits of high-skilled migrants for all parties involved. Such multilateral arrangements and partnerships can offer a way to combine migration opportunities with long-term investments in key areas such as labor market assessments, education, migrant reintegration, and diaspora engagement. They also imply a shift in focus from recruitment to investing and building skills in countries of both origin and destination. The new EU Pact on Migration and Asylum (European Commission 2020), announced by the European Commission in September 2020, includes new tools for the management of labor migration at the EU level, including Talent Partnerships. These partnerships were established to create better job opportunities at home and legal routes to the European Union, starting first in the European Union's neighborhood and the Western Balkans. The partnerships will combine mobility schemes for workers and students with related capacity-building support in migrant origin countries. Similar partnership models have also been piloted at a bilateral level through mobility skills partnerships.

Global skill partnerships (GSPs) between sending and receiving countries are promising instruments to address human capital and financial losses in the former while ensuring better skills matches in the latter. GSPs can address the potential loss of essential human capital in countries of origin while preparing potential migrants for work in the host country (Clemens 2015). Under these bilateral arrangements, the country of origin agrees to train people in the skills needed in both origin and destination countries. Some trainees choose to stay and increase human capital in the origin country, and others migrate to the destination country for some time. In exchange for receiving migrants with specifically needed skills, the destination country provides technology and finance for the training. In Europe, this approach has already been implemented by Germany, through the German Agency for International Cooperation, with pilots in Kosovo. Other destination countries such as Austria and Switzerland have already

invested in similar partnering with training centers in the Western Balkans to improve vocational and educational training for potential future migrants. For example, the Austrian Development Agency and the Austrian Federal Economic Chamber have been working together with the Serbian Federal Economic Chamber and other project partners to implement the Austrian dual-training apprenticeship system.

GSPs need to satisfy several conditions to be successfully implemented, stay sustainable, and operate at scale. First, investing in human capital expansion in both origin and destination countries should be the paramount goal, leading to long-term economic development and growth in all countries across the income spectrum. Second, extensive cooperation and collaboration between origin and destination countries formalized by enforceable bilateral or multilateral agreements are essential because GSPs involve long-term investments in both training and labor market access. Third, well-managed and systematic international social protection and labor market intermediation systems are key. Furthermore, strong institutional capacity is needed for recruitment and training provision, labor market intermediation, and diaspora engagement. In many cases, private agencies play a role in recruitment and training, which also requires capacity for oversight from education and technical and vocational education and training authorities.

To better leverage their highly skilled migrants, countries of origin can establish or strengthen strategic frameworks and institutional structures for diaspora engagement. To guide and support the implementation of diaspora programs, strategic frameworks for encouraging skills and knowledge transfers can be adopted by countries of origin. Such strategies aim to create institutional structures and implement policies or programs to attract diaspora professionals for short- and long-term engagements. Such strategies have started to be developed in some countries of origin, such as those in the Western Balkans, although implementation is still underway (OECD 2022). One example is the Albanian National Diaspora Strategy for the period 2021–25, which lays out an action plan to promote the inclusion and contribution of the diaspora in the country's socioeconomic and political development (World Bank 2023).

Developing or strengthening platforms to connect with the diaspora is a first step toward leveraging it. These platforms can provide matching and network services that connect diaspora members from different destination countries with the private and public sectors in countries of origin, and also with each other. Such initiatives can include diaspora registries, interactive portals, diaspora forums, and fellowship programs. In Albania, for example, the National Diaspora Agency has established a network of hundreds of thousands of contacts through outreach by using diplomatic

networks, newsletters, social networks, and cultural events (World Bank 2023). Diaspora forums can also help strengthen connection, dialogue, and close collaborative ties with a country's diaspora. Such forums bring together prominent diaspora members, government officials, members of academia, civil society, private entities, and international organizations, with the aim of networking and establishing cooperation opportunities in various fields. They have been implemented, for example, in Georgia (https://gda.ge/pages/economic-forum-of-the-georgian-diaspora). More evidence, however, is needed to assess which of these programs are most effective in expanding diaspora outreach and in sustaining engagement over time.

Diaspora programs can help enhance knowledge spillovers to the home country. Once linkages with the diaspora are in place, collaboration between researchers and individuals or institutions in countries of origin and abroad can generate knowledge spillovers to origin countries. This collaboration can be facilitated by establishing scientific networks, knowledge funds, or fellowship programs, potentially accompanied by financial incentives. One example of such programs is the Polish Scientists Abroad Network, which developed a scientific community that allowed Poland to expand its network and exchange ideas on a global scale. Serbia also has put significant effort into engaging with its diaspora members in education and science. The Serbian Science and Diaspora Collaboration Program established in 2019 provides financial incentives for the collaboration between local research and development agencies and the diaspora, knowledge exchange, and visits to host institutions. In addition, as part of the reforms envisioned under the Serbia Accelerating Innovation and Growth Entrepreneurship project, the Serbian Diaspora Facility was established to finance technical assistance and provide grants to scientists, researchers, and entrepreneurs from the Serbian diaspora to transfer their knowledge and skills back to the country. Some countries have sought other ways to integrate the scientific diaspora into domestic research activities. The Croatian Unity through Knowledge Fund, for example, is a dedicated grant facility for joint research projects between the Croatian diaspora and local research institutions in Croatia. Funding is awarded to research initiatives that have the potential to strengthen the Croatian economy or contribute to the development of the country's research infrastructure.

Other diaspora programs can help support investment and business creation in countries of origin. Origin countries can mobilize the diaspora to encourage foreign companies to engage in business at home. To do so, countries of origin can connect diaspora members with opportunities at home by leveraging memorandum of understanding agreements with

government and nongovernment agencies (including consulates and embassies), as is done in Albania. Some diaspora programs can also be specifically targeted to entrepreneurs. Programs providing financial incentives for the diaspora to establish businesses in their home country have been implemented in Armenia and Romania. The latter has attracted more than 1,000 Romanian migrants to develop businesses in Romania (Croitoru 2021). Other types of diaspora programs include temporary return programs for highly skilled individuals to share their expertise with experts in their home country. Another successful example of diaspora engagement programs with highly skilled emigrants that had a notable impact on the local economy was the Diaspora Invest Project in Bosnia and Herzegovina (World Bank 2023). The program was implemented between 2017 and 2022 and offered grants and technical assistance to incentivize diaspora members who are entrepreneurs to open or expand businesses in Bosnia and Herzegovina. In four years, the project provided US$2 million in grants to 164 firms. This resulted in total investments by diaspora members of US$22 million; created 1,571 jobs; and increased sales in supported businesses by 70 percent (World Bank 2023). About 75 percent of these additional sales took place in the export market, primarily in the former destination countries of diaspora members, highlighting the influence of emigrants' expertise and network.

Increasing the Benefits of the Migration Experience through Return Migration

Three main types of policy can help increase the benefits of high-skilled labor mobility through return migration. The first two types aim to increase the incidence of return migration among high-skilled migrants by (1) removing existing regulatory, bureaucratic, and informational barriers that inhibit return migration and (2) changing the financial and nonfinancial incentives to return to the home country. Finally, the third type of policy is intended to make return migrants more productive and enhance the benefits of return migration for the home economy.[10]

A first step toward increasing returns among high-skilled migrants is to remove regulatory, bureaucratic, and informational barriers that inhibit return migration. Several regulatory and bureaucratic barriers can make it difficult and costly for migrants to return to their home country. An example of such barriers relates to citizenship or residency rights. Migrants from countries without dual citizenship may have had to give up their home country citizenship to gain citizenship abroad, which can create difficulties if they want to permanently return. Additionally, they may face the disincentive of closing the option of migrating again by means of giving up their newly acquired foreign citizenship. Using cross-sectional data on

migrants in Germany and Spain, it has been shown that migrants from countries that offer dual citizenship send more remittances and express higher intent to return (Leblang 2017). Although dual citizenship makes it easier for migrants to return, many migrants marry citizens of other countries. Another constraint they face in this case is a limit to the ability of their noncitizen spouse and children to live, work, and attend school in the migrant's country of origin. These regulatory and bureaucratic bottlenecks, however, can be addressed quickly and at low cost through regulation changes. To address these issues, origin countries can give permanent residence status to foreign spouses and children to facilitate return migration, as is done in Malaysia (Lowell 2001). In the context of ECA, a recent comprehensive program made up of 50 measures to remove personal, professional, and administrative barriers was implemented in Spain.

Greater portability of social benefits, particularly retirement benefits, can also help alleviate bureaucratic constraints to return migration and may increase returns. Two key issues related to the portability of social benefits for high-skilled migrants can be identified (McKenzie and Yang 2015). The first is that migrants who work in multiple countries may not accrue enough years of work to become fully vested in the contributory pension systems of either their home or their destination country. The second is whether migrants retain eligibility to receive pension payments if they return to their home country. EU countries have many bilateral agreements, but coverage is limited for migrants who move from a non-EU ECA country to the European Union (Avato, Koettl, and Sabates-Wheeler 2010). Although pension portability can directly improve the well-being of return migrants, literature quantifying this finding or examining the impact of pension portability on the rate of return migration is lacking.

Policies relaxing informational barriers on employment opportunities and changes in conditions in the home country may also help increase returns. In addition to regulatory and bureaucratic barriers, informational barriers may prevent some migrants from returning. These barriers include a general lack of information regarding specific job opportunities or about changes in labor market conditions in the home country. Several ECA countries have attempted to reduce job search frictions by making it easier for domestic firms to locate emigrant workers interested in returning and vice versa. Job fairs, such as the ones implemented by Bulgaria or by Moldova in Italy (TFMI 2012), can help initiate direct contact between emigrants and leading companies in the home country. Offering returning migrants dedicated websites and a return migrant handbook with information on programs to help them find work and deal with the logistics of resettlement, such as in Poland, may also support return migration (TFMI 2012). Rigorous evaluations, however, have yet to be conducted to assess the effectiveness of such measures.

Increasing the Incentives to Return

Education programs encouraging brain circulation with return conditions can help countries of origin benefit from migrants' human capital accumulation. One way for countries of origin to take advantage of high-skilled emigration is to implement mobility programs for high-skilled migrants with return conditions after a certain amount of time spent in the destination country. These measures aim to encourage mobility and human capital accumulation abroad while ensuring that the country of origin ultimately benefits from the migration experience by making returns mandatory. Such programs have been implemented in several origin countries, including Kazakhstan, where the government-funded Bolashak program supports talented Kazakh students to study abroad and requires them to return to Kazakhstan and work in their respective fields for at least five years.

Financial incentive packages for the permanent return of high-skilled migrants can be effective in some contexts, if incentives are sufficiently large. Such programs include tax exemptions and benefits, interest-free or low-interest loans, temporary salary supplements to facilitate career entry, assistance with housing, schooling for children, and employment opportunities for spouses (Jonkers 2008; Lowell 2001; TFMI 2012). In Malaysia, the Returning Expert Program provides a flat tax of 15 percent on employment income for five years, the ability to import two cars tax-free, and permanent residence status to a foreign spouse and children within six months. An evaluation of this program showed that it increased the return probability for applicants with a preexisting job offer back in the home country by 40 percent and generated modest fiscal gains for the country of origin (Del Carpio et al. 2016).[11] In the ECA context, the number of such programs has grown substantially in the past two decades, although they are mostly low scale, with the exception of the Spanish return migrant program (Plan de Retorno a España). Portugal and the Slovak Republic implemented programs providing fiscal incentives to return migrants, but the magnitude of the incentives provided has been argued to be too small to have a meaningful impact on returns when compared with the large earnings gains of high-skilled migrants abroad. Even if high-skilled migrants return, narrative evidence suggests that beneficiaries of such programs use the benefits only temporarily and tend to leave the country again once the benefits expire.

Supporting the Reintegration of High-Skilled Migrants in Home Labor Markets

Policies aimed at supporting the reintegration and return of highly skilled migrants may also help increase the benefits of skilled migration. Despite

the positive wage premiums available to them in the labor market, returnees still face challenges. Once high-skilled migrants have decided to return to their home country, a second policy challenge for the origin country is to promote reintegration programs that help smooth returning migrants' transition into the domestic labor market and support returnees in starting up businesses. This is important, because migrants tend to have weaker domestic networks upon return than those who stay in the country and, given the higher rates of self-employment and entrepreneurship among returnees, may be negatively affected by administrative and institutional barriers to setting up businesses.

Reintegration plans and interventions for return migrants can be strengthened by offering a comprehensive set of services tailored to their needs, return circumstances, and future migration intentions. Reintegration programs for return migrants have existed for several years in many countries in ECA. However, a government strategy and a centralized reintegration mechanism are often lacking. As a result, those programs typically have very limited resources and outreach. Returnees could benefit from larger-scale support delivering a comprehensive array of services to eligible and interested return migrants. These services could be provided through one-stop shops for returnees and could include assistance in planning the return; helping to define a professional plan; and finding employment, lodging, and financial help for those moving back. Such support measures for returnees, however, require an upgrade and better integration of migration management systems (databases, services, and systems). Information about available resources and the procedures to obtain them through different public administrations, employment offers, and facilitation of networks of returnees could also be provided. One other key element of reintegration programs for returnees is the active participation of interested firms in connecting labor supply and demand, as included in Spain's comprehensive Plan de Retorno a España (refer to box 4.1).

Certifying skills acquired abroad may help migrants take greater advantage of their migration experience at home and in future migration episodes. Through their work experience abroad, migrants acquire skills and experience that can be valuable in origin countries' labor markets but also in another migration experience. Those skills can be destination specific, but they may also be transferable to other destination countries and potentially generate higher earnings the next time around. In Armenia, for example, more than half of returned migrants reported acquiring new skills during their experience abroad; however, almost none of these new skills were certified or documented. Within Western Europe, the Bologna Process aims to formalize recognition of higher education qualifications,

BOX 4.1 *El Plan de Retorno a España:* An Example of a Comprehensive Program for Return Migrants

In 2019, the Spanish government published the *Plan de Retorno a España* (Plan to Return to Spain), made up of 50 measures to remove personal, professional, and administrative barriers to returning to Spain, including assistance to plan the return and define a professional plan (SGIE 2019). Furthermore, the Spanish State Employment Service elaborated a plan to address the problem of high youth unemployment; one of the plan's measures is to create a program to incentivize the return of the diaspora of young people and support mobility (SEPE 2019). It includes support for self-employment and finding employment and financial help for moving back to Spain and finding lodging. It also helps returnees with one-stop shops that include information about resources available from different public administrations and their procedures, employment offers, and networks of returnees. One key element is the active participation of interested firms in the process, to connect labor supply and demand. Although the actual return of young emigrants is largely linked to employment opportunities in Spain, these measures can smooth the transition and reduce bureaucratic and information barriers while keeping stronger links with the diaspora.

but many migrants from ECA origin countries still experience difficulties obtaining overseas qualifications that are recognized in their home countries. Outside ECA, a few programs have been implemented to facilitate the recognition of qualifications and skills gained abroad, such as Argentina's Red de Argentinos Investigadores y Científicos en el Exterior (Network of Argentine Researchers and Scientists Abroad) program, which offers the translation and accreditation of qualifications formally earned abroad.

Although policy interventions to support productive return migration are being tested and implemented, systematic impact evaluations are essential in assessing their effectiveness before scale-up. Overall, global evidence on the effectiveness of policies targeted at incentivizing returns and improving the outcomes of returnees remains quite scarce. Rigorous impact evaluations are especially lacking (McKenzie and Yang 2015). Despite the incidence of self-employment among low-skilled return migrants, the effectiveness of programs facilitating entrepreneurship among returnees is also poorly documented. Similarly, for returnees who seek wage employment, it has yet to be determined whether programs aimed at reducing job search frictions are effective and under what conditions. The implementation of small-scale programs targeted to returning migrants should be systematically accompanied by rigorous impact evaluations

beyond simple follow-up quantitative and qualitative surveys and process evaluations. One example of such rigorous impact evaluations is the one assessing the impacts of the Returning Expert Program in Malaysia (Del Carpio et al. 2016).

More detailed data collection on return migrants through national household surveys or ad hoc migration surveys is needed to inform policies for high-skilled returnees. Available nationally representative household surveys rarely provide detailed information about the migration journey of past international migrants, their human capital accumulation, labor market experience, or the motivations behind the decision to migrate and return (voluntary-involuntary or planned-unplanned). This lack of information hampers the ability to better understand the impact of migration and to design adequate programs that support migrants throughout their journey, including after returning to their home country. To address this data gap, either more detailed modules on past migration episodes could be included in nationally representative household surveys or comprehensive ad hoc surveys could be developed, targeted at the population of return migrants. Nationally representative household surveys need to collect detailed information on past migration abroad to identify return migrants and link the details of their past migration experiences to labor market outcomes back home. Although such datasets remain rare, examples include the Egyptian Labor Market Survey outside ECA and the Albania Living Standard Measurement Survey in ECA,[12] which was implemented more than a decade ago. Comprehensive ad hoc migration surveys also remain quite rare in ECA and globally. Recent exceptions include the 2019 World Bank Return Migrant Survey for Bangladesh, which collected very detailed information about the past and current employment outcomes of a representative sample of those returning to Bangladesh. In ECA, the recent 2023 Kyrgyz Migration Survey, also carried out by the World Bank, collected detailed information on the past and current migration episodes and labor market outcomes of a representative sample of the Kyrgyz Republic's working-age population. Evidence-based policies targeting return migrants would benefit from implementing similar surveys in other countries of origin in the region.

Although more demanding, linking microdata between origin and destination countries is another promising avenue to connect returnees with their migration experience and inform policies for more productive high-skilled return migration. Scandinavian countries are at the forefront of these efforts. Finnish and Swedish population registers have, for example, been linked to better understand emigrant and returnee selection, using birth date, gender, municipality of residence, and year of migration to match more than 85 percent of Finns who migrated to Sweden after 1970

and who lived there in 1990 (Rooth and Saarela 2007). Such efforts to merge administrative data across national borders also extend to historical data, although such mergers are constrained by the availability of variables without which they are infeasible.

Notes

1. This share is calculated as the number of Central EU workers employed in the health care and social sectors abroad over the total number of Central EU workers employed in those sectors, both in their home countries and abroad.
2. Studies vary in terms of rigidity, particularly in terms of how they account for the double selection that happens among return migrants at both the departure and the return stages (Wahba 2015).
3. In some ECA countries, such as Albania (Carletto and Kilic 2011) and Estonia (Masso, Eamets, and Mõtsmees 2014), migrants returning from low-skilled occupations abroad do not experience significant occupational mobility upon return.
4. Borjas and Bratsberg (1996) propose a theoretical framework to account for the selection of returnees among a host country's immigrant population. They argue that selection depends on the relative skill levels in the two locations, with the skill level of return migrants lying between that of nonmigrants and migrants who stay abroad permanently. Thus, when emigrants are positively selected from the origin country's population, returnees will be negatively selected among all migrants. When emigrants are negatively selected, return migrants will be positively selected.
5. The distinct nature of intra-EU migration flows might limit the generalization of these results to other non-EU ECA countries. Descriptive evidence of the supportive effect of migration in alleviating excess labor supply in other ECA countries is more scarce. For example, during the last two decades unemployment rates in the Western Balkans have significantly dropped, coinciding with high emigration rates.
6. While evidence of the impact of emigration on wages is concentrated among OECD ECA countries, there is a lack of rigorous studies for non-OECD ECA countries.
7. See chapter 5 for a more detailed discussion of the impacts of remittance on origin countries.
8. For example, rigid employment protection legislation in countries of origin, as opposed to more flexible employment protection regulation in destination countries, has been shown to imply larger bilateral flows at the macro level (Bossavie et al. 2022).
9. Unlike regular student loans, whereby students repay the loan in fixed annuity amounts over a predetermined time horizon until the debt is extinguished, students taking out income-contingent loans begin repaying the loans only once their income exceeds a certain threshold, and the repayment amount is adjusted proportionally depending on the labor incomes of the beneficiaries (Chapman 2006).
10. See McKenzie and Yang (2015) for a detailed discussion.
11. However, no effect was reported for high-skilled emigrants without a job offer back home.
12. The dataset for Egypt is available at https://www.erfdataportal.com/index.php/catalog/157. The dataset for Albania is available at https://microdata.worldbank.org/index.php/catalog/1970.

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