

**IMF Working Paper**

Research Department

**Storm Clouds Ahead? Migration and Labor Force Participation Rates in Europe**Prepared by Benjamin Hilgenstock and Zsóka Kóczán<sup>1</sup>

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June 2018

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**Abstract**

The paper examines the potential effects of international migration on labor force participation in advanced economies in Europe. It documents that migration played a significant role in alleviating aging pressures on labor supply by affecting the age composition of receiving countries' populations. However, micro-level analysis also points to differences in average educational levels, as well as differences in the effects of any given level of education on participation across migrants and natives. Difficulties related to the recognition of educational qualifications appear to be associated with smaller effects of education on the odds of participation for migrants, especially women.

JEL classification: J11, J21, J23, J61

Keywords: Labor force participation, aging, migration

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<sup>1</sup> The authors would like to thank Oya Celasun, Céline Piton, Petia Topalova, and Gisela Waisman for very helpful comments on earlier drafts of the paper.

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## I. INTRODUCTION

Slowing population growth and rising life expectancy have been exerting pressure on old-age dependency ratios in most advanced economies (AEs) for decades and these trends are projected to accelerate further (Figure 1).<sup>2</sup> The aging of population in advanced economies is weighing on labor force participation rates (see, for example, Chapter 2 of the April 2018 *World Economic Outlook*). While rising labor market participation of those more marginally attached to the labor force, such as women and older workers, has contributed to stable or even increasing overall participation rates in most European economies (Figure 2), it will ultimately be outweighed by the sizable demographic shifts projected in these economies over the next several decades with important macroeconomic consequences (see, again, Chapter 2 of the April 2018 *World Economic Outlook*).

In light of these gloomy demographic trends, international migration can potentially alleviate the strains to advanced economies' shrinking labor force while also leveraging the demographic dividend in other parts of the world. Net migration has accounted for about half of the population growth in advanced economies since the mid-1980s, while natural population growth (measured as the difference between fertility and mortality) has been falling (Figure 3).<sup>3</sup> Nevertheless, there are concerns about migrants' integration in recipient countries given the greater challenges they face in local labor markets.

This paper provides new evidence on the potential effects of migration on future labor force participation in a large number of (receiving) advanced European economies.<sup>4</sup> It starts by quantifying how differences in the age profiles of migrants and natives can affect aggregate participation rates. It then measures the effects of convergence in the likelihood of labor market attachment between migrants and natives on the aggregate participation rate. Finally, in order to inform the policy debate on how to speed the process of convergence in participation rates between migrants' and natives, it examines the drivers of migrants' decisions to participate using micro-level data. Most of the analysis focuses on European

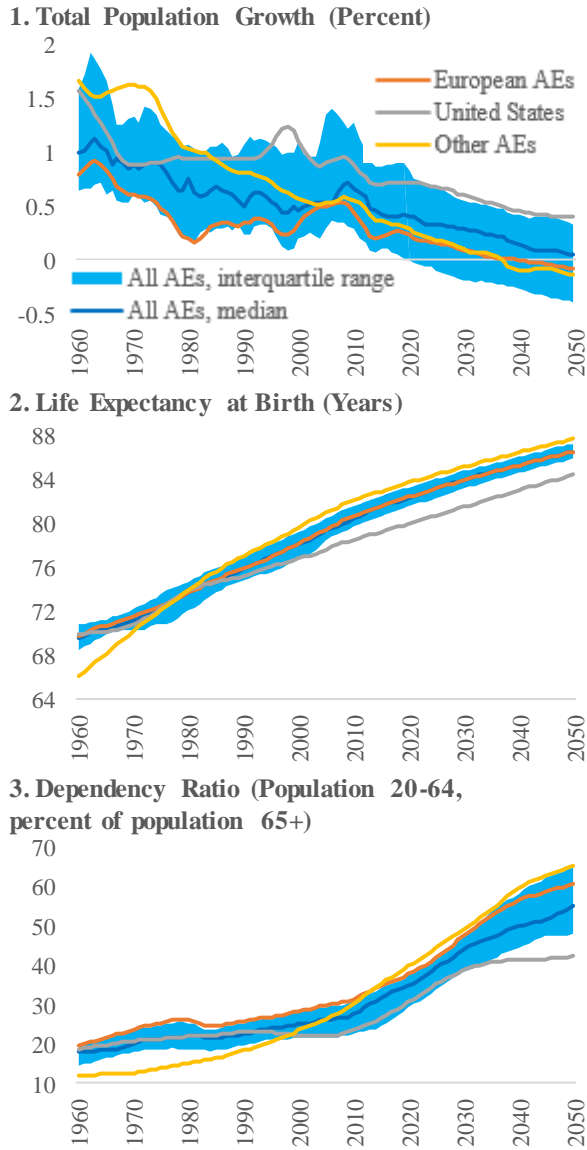
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<sup>22</sup> Population growth is projected to slow by 0.34 percentage points in the median AE, 0.32 in both European AEs as well as the United States, and 0.47 percentage points in other AEs by 2050. Life expectancy at birth is projected to rise by 4.8 years in the median AE, 4.8 years in European AEs, 5 years in the United States, and 4.6 years in other AEs. Dependency ratios will reach 55 percent in the median AE, 60 percent in European AEs, 42 percent in the United States, and 65 percent in other AEs.

<sup>3</sup> The evolution of migrant stocks as a percentage of total populations is depicted in Figure 4.

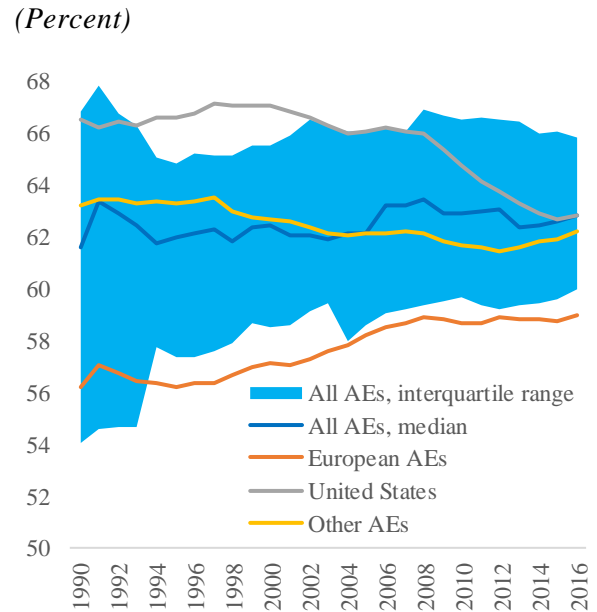
<sup>4</sup> The focus of this paper is solely on participation, and does not include other labor market outcomes such as employment. While there is a large literature on other channels through which migration may affect labor markets, for instance through the direct effects of migration on the employment of natives, this is outside the scope of this paper.

**Figure 1. Population Dynamics in Advanced Economies, 1960-2050**



Sources: United Nations; and authors' calculations.  
 Note: European advanced economies include AUT, BEL, CHE, CYP, CZE, DEU, DNK, ESP, EST, FIN, FRA, GBR, GRC, IRL, ISL, ITA, LTU, LUX, LVA, MLT, NLD, NOR, PRT, SVK, SVN, and SWE. Other advanced economies are AUS, CAN, HKG, ISR, JPN, KOR, MAC, NZL, and SGP. Abbreviations in the note use International Organization for Standardization (ISO) country codes. Series for European AEs and other AEs show population weighted averages. AEs = advanced economies.

**Figure 2. Evolution of Labor Force Participation Rates in Advanced Economies, 1990-2016 (Percent)**

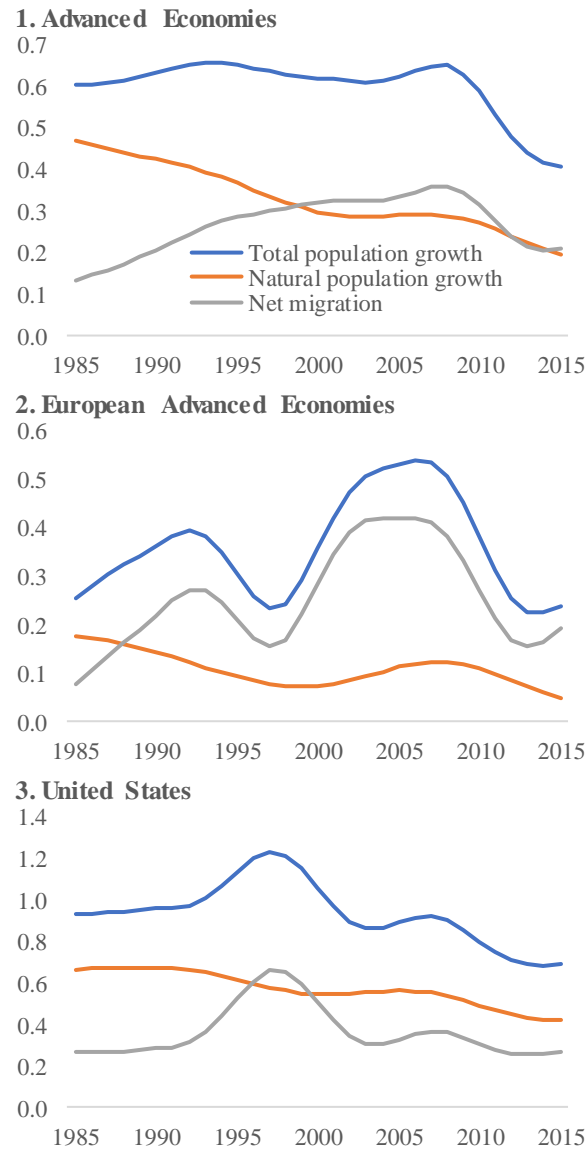


Sources: Organisation for Economic Co-operation and Development; and authors' calculations.  
 Note: European AEs include AUT, BEL, CHE, CZE, DEU, DNK, ESP, EST, FIN, FRA, GBR, GRC, IRL, ISL, ITA, LUX, NLD, NOR, PRT, SVK, and SWE. Panel is balanced starting in 1994. Other AEs include AUS, CAN, ISR, JPN, KOR, NZL, and SGP. Panel is balanced for full time period. Abbreviations in the note use International Organization for Standardization (ISO) country codes). AEs = advanced economies.

advanced economies; other advanced economies, including the United States are included in some of the stylized facts for reference.

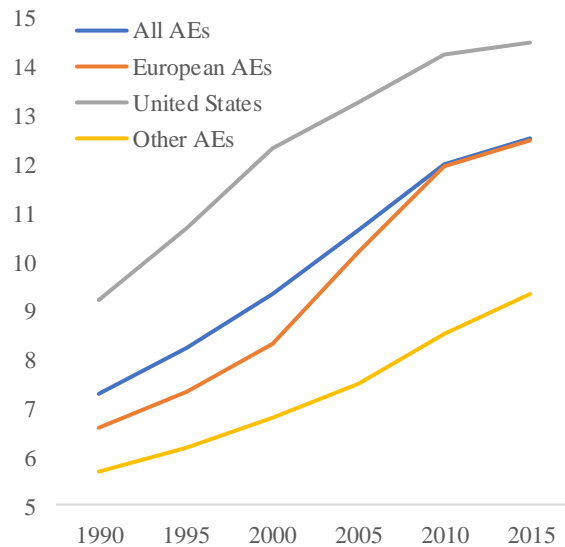
The paper documents that migration assumptions, already embedded in population projections for advanced economies, play a very significant role in mitigating the effects of aging on labor supply. As migrants are more likely to be prime-age than natives, this compositional

**Figure 3. Contributions of Natural Population Growth and Net Migration to Total Population Growth, 1985--2015**  
(Percent)



Sources: United Nations; and authors' calculations.  
 Note: Panel 1 is based on a balanced sample of 34 advanced economies. Natural population growth refers to the difference between fertility and mortality.

**Figure 4. Migrant Stocks in Advanced Economies, 1990-2015**  
(Share of population)



Sources: United Nations; and authors' calculations.  
 Note: European AEs include AUT, BEL, CHE, CYP, CZE, DEU, DNK, ESP, EST, FIN, FRA, GBR, GRC, IRL, ISL, ITA, LTU, LUX, LVA, MLT, NLD, NOR, PRT, SMR, SVK, SVN, and SWE. Other AEs include AUS, CAN, HKG, ISR, JPN, KOR, MAC, NZL, PRI, and SGP. Abbreviations in the note use International Organization for Standardization (ISO) country codes. AEs = advanced economies.

effect alleviates the pressures of aging on participation rates. In the absence of migration, the decline in participation would be significantly deeper. These gains could, however, be further strengthened by supporting migrants' labor force participation—prime-age migrants' (especially migrant women's) participation is typically below that of natives, though increases with years since migration. The micro-level analysis also points to differences in education levels across

migrants and natives, and, in addition to this, smaller positive effects of education on the odds of participation, especially for women, with the latter likely related to difficulties in the recognition of educational qualifications. Targeted support in this area could thus yield significant further gains.

The rest of the paper is structured as follows. Section II presents a brief overview of the relevant literature on migrants' labor force participation, Section III describes the dataset used, and Sections IV and V examine the roles of age composition and the participation effects of migration respectively. Section VI presents the microlevel analysis, Section VII zooms in on obstacles to migrants' labor market integration and Section VIII concludes.

## II. LITERATURE REVIEW

This paper contributes to several strands of literature on the economic impacts of international migration. Most papers looking at migration and labor force participation rates examine either the age effects of migration, or the participation of migrants, and typically focus on individual countries. Numerous papers explore the demographic implications of migration (see for example Brown and Guttman 2017 for Australia, Holzmann 2005 for advanced economies, Nichols and others 2015 for the United States). These papers typically focus on the age composition of migrants relative to the native population, but do not examine differences in participation rates across the two groups. A notable exception is Cully (2011), which examines both the age effects and the participation effects of migration on the aggregate participation rate in Australia, and finds that it added almost 2 percentage points to the aggregate participation rate over the 2001-2011 period.

A number of papers analyze the differences in participation rates of migrants relative to natives and examine the drivers of migrants' participation decisions. Borjas (2017) contrasts undocumented immigrants with legal immigrants and natives and finds that the labor force participation rate of undocumented men is higher than that of natives or legal immigrants and that this gap widened over the past two decades. However, the participation of undocumented women is far below that of both legal immigrants and natives. Meyer (2016) examines labor market outcomes of immigrants in Germany and finds positive effects of German language skills and having a German degree on labor market outcomes, and notes convergence in participation to natives' levels after 20 years.

Several studies focus specifically on migrant women's labor force participation and the roles of gender norms, parenthood and spousal income. Rubin and others (2008) conduct a thorough analysis of the drivers of migrant women's labor force participation using Eurostat's European Union Labour Force Survey and highlight the importance of years since migration and the age of youngest child, alongside important differences across countries. Holland and de Valk (2016) look at the participation of second generation Turkish women in France, Germany, the Netherlands and Sweden and find 'motherhood gaps' in participation (larger negative effects of parenthood on participation for migrant than for native women) in France and the Netherlands, but not in Germany and Sweden. Khoudja and Fleischmann (2015) exploit variation across different ethnic groups in the Netherlands to examine the impact on participation of the interactions between spousal income and gender roles, and

note significant differences. Similarly, Kok and others (2011) examine the impact of home- and host-country culture on the participation of migrant women in the Netherlands.<sup>5</sup>

This paper contributes to this literature by combining an analysis of the age effect and the impact of different migration scenarios on population and participation projections, with individual-level analysis of the drivers of migrants' participation decisions. It aims to complement existing studies by focusing on the effects of education instead of family composition, and looking at the participation of migrant men as well as women.

### III. DATA

The paper relies on population data from the United Nations and historical labor force participation rates from the Organisation for Economic Co-operation and Development (OECD). We project labor force participation rates by combining population projections data from Eurostat and the United Nations, and the historical estimates of participation rates from the OECD.<sup>6</sup>

The micro-level analysis of the drivers of migrants' and natives' participation decisions relies on microdata from Eurostat's European Union Labour Force Survey (EULFS). The EULFS is a very large representative household survey, focused on the labor force participation of people aged 15 and over as well as on persons outside the labor force.<sup>7</sup> The surveys are conducted by national statistical institutes across Europe and are centrally processed by Eurostat. The national statistical institutes are responsible for selecting the sample, preparing the questionnaires, conducting the direct interviews among households, and forwarding the results to Eurostat in accordance with the requirements of the regulation. Harmonized data is then made available at the European level.

The paper uses a random sample of 10,000 respondents per country per year for 25 European economies over the period 2000-2016.<sup>8</sup> Labor force participation is measured

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<sup>5</sup> A detailed discussion of large literature on the effects of migration on natives' labor market outcomes is outside the scope of this paper, but generally finds the impact of migration on average wages or employment of native workers to be limited (see Aiyar and others 2016; Akgunduz, van den Berg, and Hassink 2015; Card 1990; Peri 2014, and IMF 2015). Numerous papers also examine the effects of (predominantly male) migration on the participation of those (especially women) who are left behind in the home countries (see e.g. Hanson 2007 and Wang 2013 on Mexico, Karymshakov and Sulaimanova 2017 on Kyrgyzstan, Khan and Valatheeswaran 2016 on the state of Kerala in India, Yun 2014 on Tajikistan).

<sup>6</sup> The following analysis and figures rely on United Nations and Eurostat projections, which may, however, differ from alternative sources of populations projections, for instance from national agencies.

<sup>7</sup> The survey includes private households; persons carrying out obligatory military or community service, and persons in institutions/collective households are not included in the target group of the survey.

<sup>8</sup> The following countries are included in the sample: Austria, Belgium, Cyprus, Czech Republic, Denmark, Germany, Estonia, Finland, France, Greece, Iceland, Ireland, Italy, Latvia, Lithuania, Netherlands, Norway, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom. Information on family composition is not available for Denmark, Finland, Iceland, Norway, Sweden and Switzerland so regressions



based on the reported main labor force status of respondents. The status is coded here as *employed* (if a person has a job or profession, including unpaid work for a family business, apprenticeship, or paid traineeship), *unemployed*, or *out of the labor force* (including people who are students, retired, permanently disabled, in compulsory military service, fulfilling domestic tasks, and otherwise inactive), based on respondents' answers about their activity during the reference week. The EULFS provides information on various individual and household characteristics used in the analysis, such as age, gender, education, and family composition. Importantly, it allows us to distinguish between migrants and natives based on country of birth.

One of the determinants of migrants' participation decisions analyzed in the paper is the routinizability of an individual's occupation. This is measured following Das and Hilgenstock (forthcoming), who construct routinizability scores for nine occupation groups based on the ISCO–88 one-digit level by assigning individual occupations' scores from Autor and Dorn (2013) to these groups and calculating the median for each group.

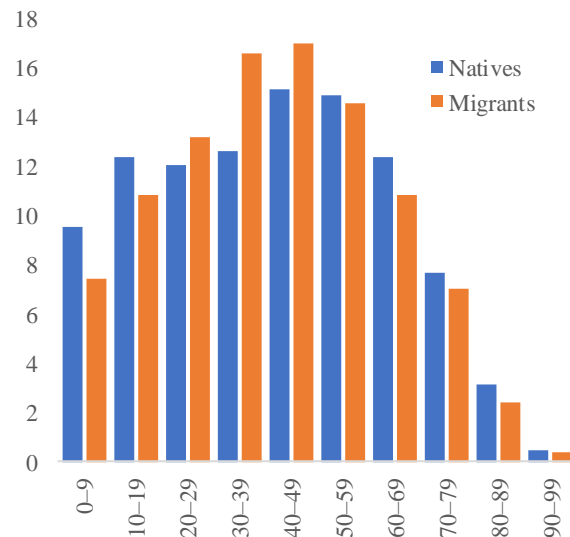
Data on migrant integration policies is from the Migrant Integration Policy Index database (MIPEX), and is discussed in greater detail in Section VI.

#### IV. THE ROLE OF AGE COMPOSITION

One way migrants affect the labor supply in recipient economies is through age composition. Migrants are more likely to be of prime working age than natives because they typically arrive after they have completed their education and often leave when they retire. This is certainly the case in the sample of European economies included in our study as depicted in Figure 5. This shows a simple average across all countries in the sample over the years 2000–2016; the pattern also holds when looking country by country. As participation is highest among

**Figure 5. Age Profile of Natives and Migrants**

(Percent of population)



Sources: United Nations; and authors' calculations.

Note: Countries included are AUT, BEL, CYP, CZE, DEU, DNK, ESP, EST, FIN, FRA, GBR, GRC, IRL, ITA, LTU, LUX, LVA, MLT, NLD, NOR, PRT, SVK, SVN, and SWE. Labels in the figure use International

Organization for Standardization (ISO) country codes. are estimated on a subset consisting of the other 19 economies only becomes available after 2000, so the final sample used in the regressions is unbalanced across countries. Unfortunately, data on country of birth is often aggregated in this dataset, for instance into broad categories such as EU or non-EU countries – the paper thus cannot examine how participation decisions of migrants differ by countries of origin, or how refugees differ from economic migrants. A random sample rather than the full dataset is used to facilitate time-intensive computations.

those of prime working age, age composition could thus have significant implications for overall labor force participation.

Figure 6<sup>9</sup> examines how these age effects would affect the evolution of labor force participation going forward. To quantify their role, we project country-level labor force participation by holding participation rates by gender and age group constant at their respective 2015 levels and weighting these by the groups' respective population shares, which change over time.<sup>10</sup> In this exercise, participation rates do not differ between natives and migrants and changes are solely a result of changes in the age composition. For gender-age group  $l$ , country  $i$ , and time  $t$ , country-level labor force participation rates are constructed as

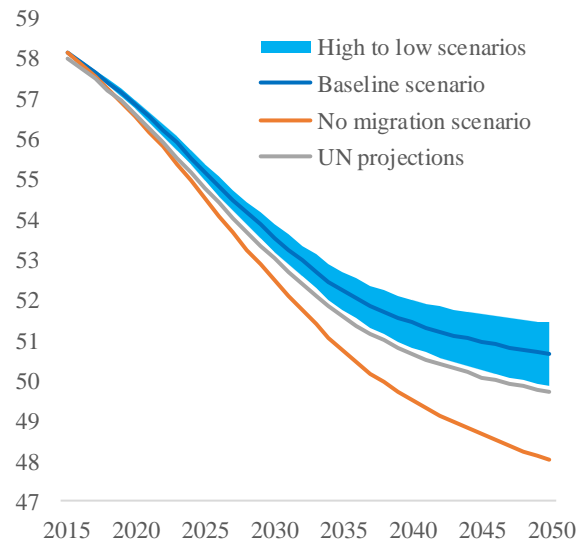
$$LFPR_{it} = \sum_l \omega_{lit} \times LFPR_l$$

where  $\omega_{lit}$  represents gender-age group  $l$ 's population share in country  $i$  at time  $t$ .

The figure illustrates the expected evolution of aggregate labor force participation in advanced European economies under Eurostat's alternative migration scenarios, where differences stem solely from changes in the age composition of the countries' populations as a result of net migration.

The Eurostat baseline scenario is broadly based on trend extrapolation of net migration as a share of each receiving country's population until 2050 (see European Commission 2017). The baseline scenario would imply, for instance, an increase in Germany's migrant stock from the current 14 percent to 29 percent of the population. The high (low) migration scenarios refer to a one-third increase (decrease) in net migration

**Figure 6. Participation Rate, All European Advanced Economies, 2015-2050**  
(Percent)



Sources: Eurostat; United Nations; and authors' calculations.

Note: Countries included are AUT, BEL, CYP, CZE, DEU, DNK, ESP, EST, FIN, FRA, GBR, GRC, IRL, ITA, LTU, LUX, LVA, MLT, NLD, NOR, PRT, SVK, SVN, and SWE. Labels in the figure use International Organization for Standardization (ISO) country codes. Detailed migration scenarios are based on Eurostat data and are compared to United Nations baseline scenario.

<sup>9</sup> Figure 6 shows population-weighted averages across countries.

<sup>10</sup> Five-year age groups are used for persons between ages 15 and 64 and all persons ages 65 or higher are collapsed into one group. Persons ages 14 and younger are not included in the analysis.

relative to the baseline (so for Germany would result in migrant stocks of 25 and 33 percent of the population, respectively, by 2050).

The United Nations baseline scenario assumes a continuation of recent migration trends for nonrefugee flows until 2050, but also considers the country's migration policy stance (see United Nations 2017 for details). While on average this produces estimates broadly consistent with the European Union's low-migration scenario, this is not necessarily the case for individual countries

Under the baseline scenario, the average aggregate participation rate would decline by 7.4 percentage points by 2050. This would have significant macroeconomic consequences: within a simple aggregate production framework with a labor share of 56 percent (the average labor share of income in 2017 for a subset of advanced economies) this would translate into a 4.1 percentage point reduction in potential output by 2050.

Allowing for an increase in net migration could offset some of this decline: the drop would be 0.8 percentage point less under the assumption of high migration. Alternatively, it would be 0.8 percentage point more under low migration. More restrictive immigration policies would significantly exacerbate the negative effect of population aging on participation. Strikingly, if no new migration is allowed, the decline in participation would be 2.7 percentage points larger. In other words, labor force participation in the median economy in Europe could decline by more than 10 percentage points by 2050 in the absence of migration flows.

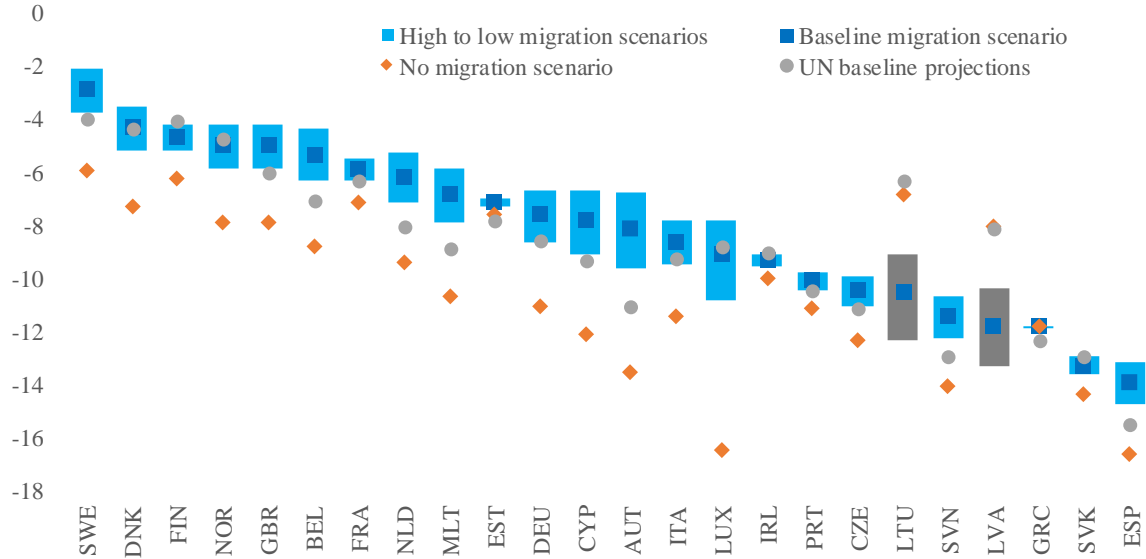
These numbers hide significant heterogeneity across countries. Figure 7 shows the changes in labor force participation rates under different scenarios for each country individually. The average spread between the high and low migration scenarios is 1.1 percentage points, but ranges from more than 2.5 points in Austria and Luxembourg to less than 0.5 points in Estonia, Greece, and Spain. In two countries, Latvia and Lithuania, due to large projected *outmigration* (especially of the young and prime-age), the low migration scenario would result in significantly *smaller* decreases in labor force participation (2.9 and 3.2 percentage points respectively). Interestingly, even among high migration countries experiences vary significantly: while in the case of France, the difference between the low and high migration scenarios is only 0.8 percentage points, it is 1.9 percentage points in Germany and about 1.6–1.7 percentage points in Spain, Italy, and the United Kingdom. Countries that display large declines in the no-migration scenario (for example Austria, Luxembourg, the Slovak Republic, Slovenia, and Spain) are those that are confronting particularly intense challenges arising from aging populations. Countries for which the baseline-to-no-migration-scenario difference and the interquartile range are particularly large (for example Austria, Belgium, Germany, Luxembourg, and Portugal) are those that see the highest inflows of migrants relative to their respective populations or see the biggest differentials in age profiles between natives and migrants.

In a large majority of countries, the no migration scenario would lead to a dramatic decline in labor force participation, ranging from around 6 percentage points in Sweden and

Finland to more than 15 percentage points in Luxembourg and Spain. The full evolution of participation rates under different scenarios is shown for eight large European economies in Appendix Figure 1.

**Figure 7. Changes in Labor Force Participation Rate, 2015-2050**

(Percentage points)



Sources: Eurostat; United Nations; and authors' calculations.

Note: Bars in gray indicate that due to substantial out-migration, low migration scenario leads to a smaller decrease in labor force participation compared to high migration scenario.

## V. PARTICIPATION EFFECTS OF MIGRATION

While migration can boost aggregate participation rates through the age effects discussed above, participation rates also differ between migrants and natives, and these differences vary by gender and age.

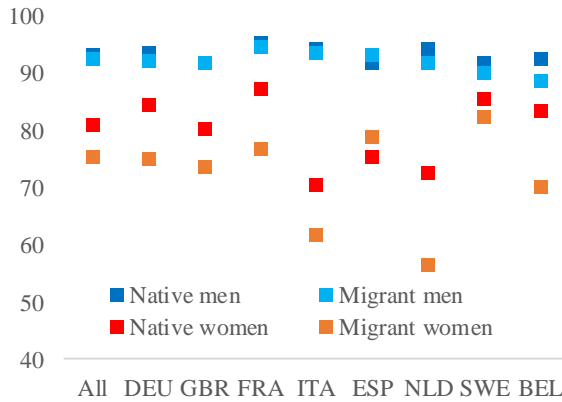
Disaggregated data from the EU LFS looking at 25 advanced European economies suggest that the participation of prime-age men is very similar for natives and migrants (Figure 8, panel 1), while participation is significantly lower among prime-age migrant women than among prime-age native women (75 percent versus 81 percent).<sup>11</sup> This is in line with the findings of Rubin and others (2008), who note this pattern for ‘old’ migrant-receiving countries (such as Germany, France, the Netherlands, the United Kingdom), while adding that in ‘new’ migrant-receiving countries in Southern Europe (Greece, Portugal,

<sup>11</sup> The statistics discussed are simple averages computed from the 10,000 persons per country per year random sample from 25 economies over 2000–2016. Differences between migrant and native women are typically statistically significant, though patterns vary across countries.

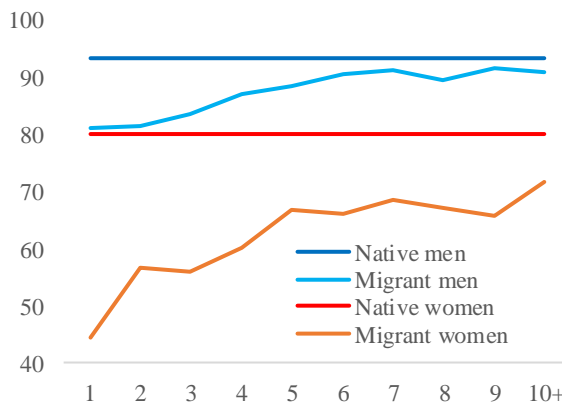
**Figure 8. Labor Force Participation Rates of Prime-Age Natives and Migrants, 2000-2016**

(Percent)

**1. Participation Rates by Sex and Immigration Status**



**2. Evolution of Participation Rates by Sex and Immigration Status**



Sources: Eurostat, European Union Labour Force Survey; and authors' calculations.

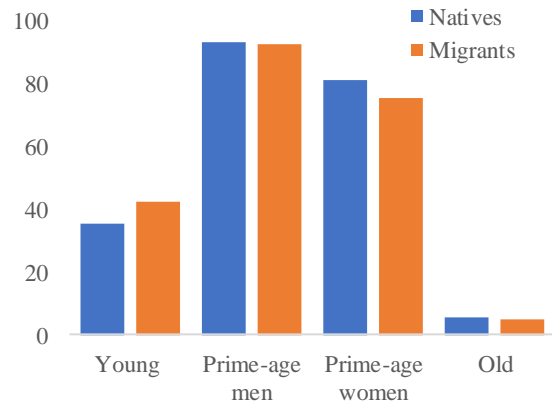
Note: In panel 1, "All" refers to European advanced economies as listed in the note to Figure 4. Panel 2 is based on the eight countries listed in panel 1. x-axis in panel 2 denotes year since migration.

Migrant participation rates converge toward those of natives over time: participation increases with years in the host country, especially for prime-age women (Figure 8, panel 2). This pattern has also been noted by Rubin and others (2008) and Meyer (2016).

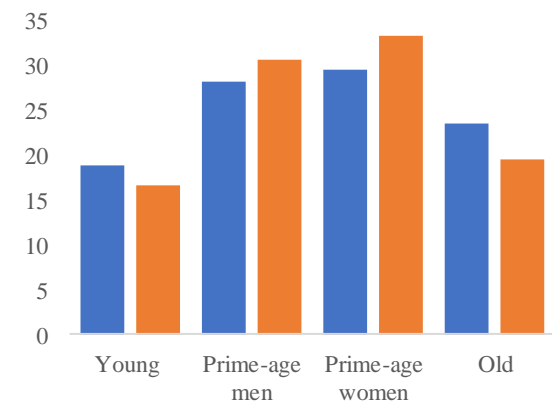
Figure 9 panel 1 looks beyond the prime-age and highlights that young migrants are more likely to be in the labor force than young natives (42 versus 36 percent; young natives are on average more likely to be in education), but participation among migrants 55 and older

**Figure 9. Participation Rates and Population Shares, Natives vs. Migrants by Sex and Age Group**

**1. Participation Rates by Sex, Age, and Immigration Status (Percent)**



**2. Population Shares by Sex and Age, Natives vs. Migrants (Percent)**



Sources: Eurostat, European Union Labour Force Survey; and authors' calculations.

Spain) the participation rate of migrant women actually exceeds that of native women, as these migrants tend to be younger.

is slightly lower than for natives in the same age group (5 versus 6 percent). As noted in Section IV, panel 2 confirms that migrants are more likely to be prime-age than natives.

If the participation rates of migrants were to increase to those of natives, this could result in further gains in aggregate participation, even abstracting from the age composition effect discussed above (holding the relative shares of different age groups of migrants as well as natives in the population constant). The aggregate participation rate of country  $i$  can be written as the population-share weighted average ( $pop$ ) of the participation rates of migrants ( $m$ ) and natives ( $n$ ) in four groups each ( $g$ , including young, prime-age men, prime-age women, older workers):

$$PR_i = \sum_{g=1}^4 PR_{gi}^m pop_{gi}^m + \sum_{g=1}^4 PR_{gi}^n pop_{gi}^n$$

If prime-age and 55-plus migrants' participation rates are assumed to increase to natives' levels (such that for these three groups  $PR_{gi}^m = PR_{gi}^n$ ), while young migrants' participation stays constant (it already exceeds young natives'), this would result in an additional 1.4 percentage point increase in overall participation (relative to a no convergence scenario), in addition to the age composition effect discussed above (Figure 9).

## VI. MIGRANTS' PARTICIPATION DECISIONS

What is holding back migrants' involvement in the labor market? The following analysis estimates logit models on a random sample of 10,000 respondents per country per year, where the dependent variable is a dummy variable indicating whether someone is in or out of the labor force.<sup>12</sup> Recognizing that participation decisions may be shaped by different factors over a person's life time, these regressions are estimated separately for different subgroups of workers: namely prime-age migrant men, prime-age native men, prime-age migrant women, prime-age native women, older natives and older migrants. The participation of individual  $j$  in country  $i$ , region  $r$  at time  $t$  (a dummy variable)

$$part_{jirt} = age_{jirt} + urban_{jirt} + educ_{jirt} + routinization_{jirt} + X_{jirt} + \alpha_i + \gamma_r + \delta_t$$

is thus linked to the individual's age, whether the respondent lives in an urban or rural area, their highest level of education completed (lower secondary, upper secondary, or tertiary) and the routinization score of their current occupation (if currently employed) or last occupation (if currently unemployed or inactive). Motivated by the findings of the existing literature, regressions also control for measures of family composition in the vector  $X_{jirt}$ : the number of children; other employed adults in the household; and whether the individual lives in a household of a single adult without children (the baseline category), a single adult with children, or as a couple with or without children. Country, region and year fixed effects are

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<sup>12</sup> The empirical strategy follows that in Chapter 2 of the April 2018 *World Economic Outlook*, but zooms in on differences between migrants and natives.

included, and standard errors are clustered at the country-year level.<sup>13</sup> These logit regressions are then estimated separately for natives and migrants (based on country of birth), and by age group, as shown in Table 1 and Figure 10.<sup>14</sup>

Migrants' participation decisions are shaped by many of the same factors that shape those of natives. Those who are more educated participate more: for instance, having tertiary education roughly doubles the odds of participating for prime-age native men, relative to having only lower secondary education (the baseline category). Effects are even larger (around 2.5 times) for prime-age native women. Household composition matters for both natives and migrants: being in a couple and having children typically increases the odds of participation for prime-age men, but lowers it for prime-age women.

There is some evidence of local labor market effects: other employed adult(s) in the household are associated with higher odds of participation.<sup>15</sup> Working or having worked in an occupation that is more easily routinizable is associated with lower odds of participation.<sup>16</sup>

Additional regressions for the migrant sample extend the baseline specification by including years since migration as an additional control. In line with the trends illustrated in Figure 8 panel 2 and the findings of the existing literature, an additional year in the host country is estimated to increase the odds of participation by 4–7 percent, even when controlling for individual and household characteristics.

These results also point to significant differences between the drivers of the participation decisions of migrants and natives. The effects of household composition are somewhat larger for migrants (being married and having children has larger negative effects on the participation of migrant women than on native women and this effect is statistically significantly different, in line with the existing literature), while local labor market effects

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<sup>13</sup> Results are robust if interacted country-year fixed effects are included instead.

<sup>14</sup> Separating the group of migrants further into those from within the European Union and those from elsewhere points to broadly similar patterns across the two groups.

<sup>15</sup> While this is outside the scope of this paper, further analysis could examine how this relates to regional labor market conditions.

<sup>16</sup> Results on education, other individual characteristics and household composition are robust to including a set of (last) occupation dummy variables instead of the routinization score.

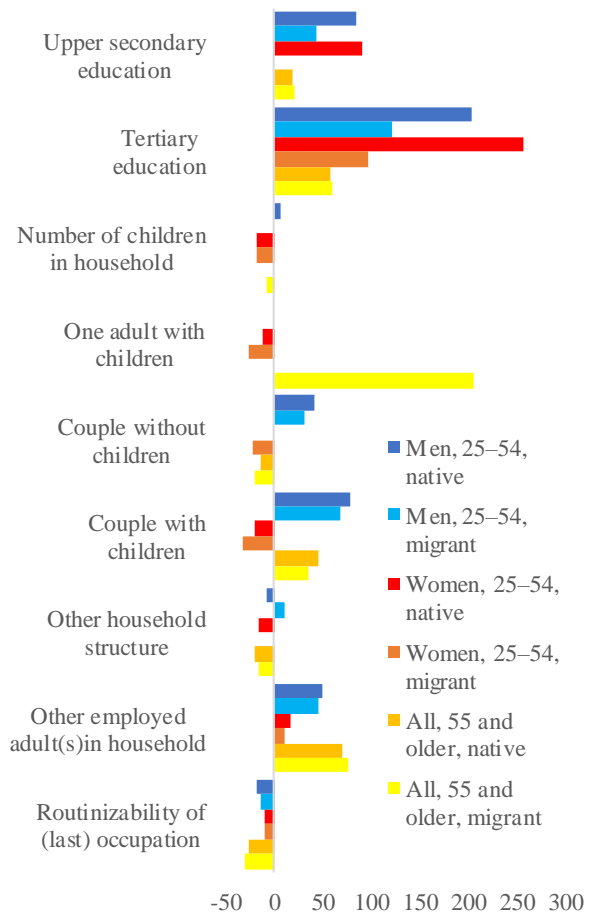
appear to be weaker for migrant women, but are not statistically significantly different from each other.

**VII. OBSTACLES TO INTEGRATION**

A key difference between migrants and natives, and much-less discussed in the literature, relates to the effects of education on participation. Migrants are typically less educated than natives and this difference is particularly pronounced for women: for instance, 26 percent (27 percent) of prime-age migrant men (women) have only completed up to lower secondary education, as opposed to 20 percent (18 percent) of prime-age native men (women).

However, in addition to these differences between average education levels, ‘returns to education’, in terms of their effects on the odds of participating also differ between migrants and natives. Although higher education increases the odds of being active for both migrants and natives, the effects are statistically significantly smaller for migrants. For instance, while as noted above, tertiary education roughly doubles the odds of participating for prime-age native men, it only increases it by about 20 percent for migrants relative to the base category. The difference is even more striking for women – ‘returns to education’ in terms of the increase in the odds of participation appear to be higher for native prime-age women than for native prime-age men, while they are even smaller for migrant women than for migrant men. These regression results thus suggest that not only is lower average educational attainment weighing on the participation of migrants, their returns to it, in terms of increasing the odds of participating, are also lower, even when controlling for differences in levels.

**Figure 10. Change in the Odds of Being Active (Percent)**



Sources: Eurostat, European Union Labour Force Survey; and authors' calculations.  
 Note: Logit regressions based on 10,000 respondents a year a country random sample of 18 countries. Only effects significant at the 10 percent level are shown. The base category for education is "up to lower secondary education"; for family composition the base category is "one adult without children." The routine exposure coefficient is scaled by the difference between the 25th and 75th percentiles. Regressions also control for age, gender, urban/rural location, year, country and region fixed effects, and the output gap. Standard errors are clustered at the country-year level.

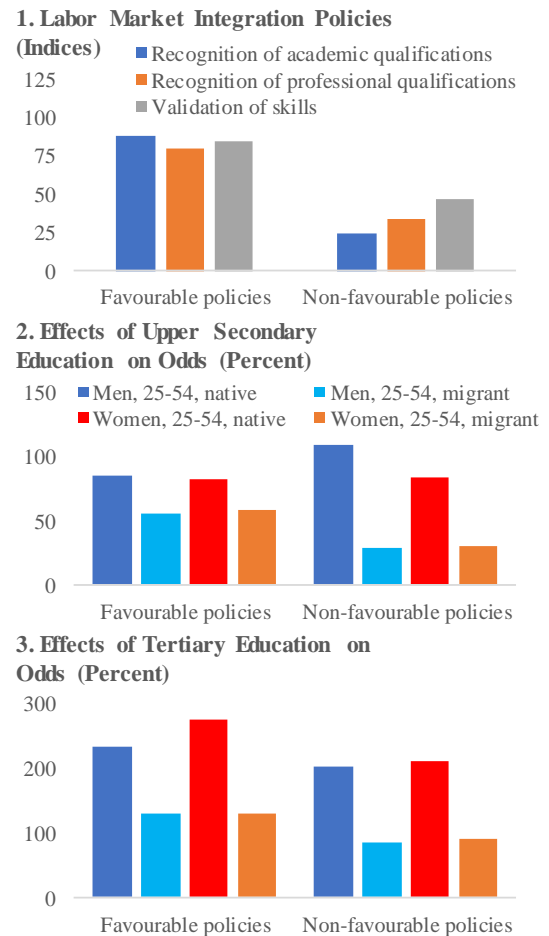


One potential reason for this finding could be the difficulty migrant workers may face in getting the same return to education as natives. This would also be consistent with the large literature on migrant wage gaps, which suggests that even conditional on observables migrants tend to earn less than natives, possibly due to difficulties in having their qualifications recognized (see for instance Schmitt and Wadsworth 2006, Coulombe and others 2014).

Migrant integration policies, however, seem to play an important role in bridging the gap between the sensitivity of participation of migrants and natives to educational attainment. To examine their role, we reestimate the equation in Section VI above separately for countries with more favorable policies related to the recognition of education and professional qualifications earned abroad and those less favorable policies in that regard.

Figure 11, panel 1 shows three indicators from the Migrant Integration Policy Index (MIPEX) – recognition of academic qualifications, recognition of professional qualifications, and validation of skills – for two country groups: countries with favorable policies and countries with non-favorable policies.<sup>17</sup> Panels 2 and 3 show the average effects of different educational attainment levels on the

**Figure 11. Migrant Labor Market Integration and Odds of Being Active**



Sources: Eurostat, European Union Labour Force Survey; Migrant Integration Policy Index (MIPEX); and authors' calculations.

Note: Numbers in panel 1 represent simple averages within groups and years for 2010-2014 period. For methodological details see note of Figure 10.

<sup>17</sup> Countries with favorable policies are defined as those with the average of the three indices above the median and include BEL, DEU, ESP, GBR, NLD, and PRT. Countries with non-favorable policies are AUT, FRA, GRC, IRL, ITA, and LUX. CYP, CZE and SVK are omitted from this part of the analysis due to the small number of migrants in the sample. Recognition (of professional qualifications in regulated professions such as law, medicine, architecture acquired abroad, and of academic qualifications acquired abroad) receives a score of 100 if the same procedures and fees apply as for nationals, a score of 50 if different procedures apply than for nationals (e.g. more documents and/or higher fees are required) and a score of 0 if this is ad hoc or there is no procedure for the recognition of titles for certain residents or certain fields of study (e.g. recognition depending on mutual recognition agreements). Validations of skills refers to the existence of a single procedure for the validation of skills/competences acquired abroad and receives a score of 100 if there is a single procedure and the same fees for foreigners and nationals, a score of 50 if the procedure is different than for nationals (e.g. more documents and/or higher fees are required) and a score of 0 if this is ad hoc or there is no procedure for the validation of skills for certain residents or certain professional fields.

odds of being active from country-specific logit regressions for the two groups. This points to smaller differences between natives and migrants in countries with favorable policies for upper secondary education. Favorable policies in turn increase the positive effects of tertiary education on the odds of participating for both natives and migrants (but do not reduce the difference between them).<sup>18</sup>

### VIII. CONCLUSIONS

The paper documented that migration plays a very significant role in alleviating aging pressures. This is driven primarily by an age composition effect as migrants are more likely to be prime-age than natives. In the absence of migration, the decline in participation would thus be significantly deeper. Higher migration flows could contribute to labor supply and the host economy more broadly as well—increasing output per capita by boosting demand and investment, contributing to technological progress, and increasing labor productivity, including through skill complementarity.<sup>19</sup>

The analysis, however, also points to lower participation rates among migrants than among natives, though the participation gap tends to narrow with years since migration. In addition to differences in average education levels, the effects of any given level of education on participation also appear to be smaller for migrants than for natives. These results suggest that policies that support migrant integration, such as recognition of educational qualifications or language training, could increase the positive effect of migration on participation in (receiving) advanced economies, beyond its effects on age composition (see also Chapter 4 of the October 2016 *World Economic Outlook*). This could help mitigate some of the future negative effects of aging and help make social safety nets more sustainable in these economies.

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<sup>18</sup> Unfortunately, the time coverage of the MIPLEX indicators is too short to be included in the regressions directly.

<sup>19</sup> See Chapter 4 of the October 2016 *World Economic Outlook* for a summary; see also Aiyar and others 2016; Alesina, Harnoss, and Rapoport 2015; Cattaneo, Fiorio, and Peri 2015; D’Amuri and Peri 2014; Farré, González, and Ortega 2011; Hunt and Gauthier-Loiselle 2010; Jaumotte, Koloskova, and Saxena 2016; Ortega and Peri 2014, Peri, Shih, and Sparber 2015; and Peri and Sparber 2009.

**Table 1: Determinants of Labor Force Participation**

	Men, Ages 25-54			Women, Ages 25-54			All, 55+		
	Natives	Migrants	Migrants	Natives	Migrants	Migrants	Natives	Migrants	Migrants
<i>Age</i>	1.161*** (0.0130)	1.148*** (0.0168)	1.141*** (0.0264)	1.334*** (0.0166)	1.284*** (0.0240)	1.225*** (0.0294)	1.427*** (0.131)	1.330*** (0.144)	2.781 (2.445)
<i>Age squared</i>	0.998*** (0.000140)	0.998*** (0.000183)	0.998*** (0.000290)	0.997*** (0.000149)	0.997*** (0.000222)	0.998*** (0.000299)	0.998*** (0.000607)	0.998*** (0.000768)	0.993 (0.00605)
<i>Male</i>							1.196*** (0.0337)	1.230*** (0.0733)	1.139 (0.192)
<i>Upper secondary education</i>	1.840*** (0.0418)	1.443*** (0.0454)	1.311*** (0.0542)	1.918*** (0.0399)	1.377*** (0.0510)	1.077 (0.0561)	1.195*** (0.0386)	1.211*** (0.0760)	1.103 (0.261)
<i>Tertiary education</i>	3.051*** (0.106)	2.213*** (0.0905)	1.887*** (0.108)	3.573*** (0.0995)	1.969*** (0.115)	1.294*** (0.0805)	1.585*** (0.0667)	1.595*** (0.103)	1.385 (0.325)
<i>Urban</i>	1.003 (0.0202)	0.986 (0.0305)	0.922* (0.0421)	1.017 (0.0147)	1.012 (0.0238)	1.030 (0.0356)	1.040 (0.0309)	0.914 (0.0517)	1.507** (0.288)
<i>No. of children in household</i>	1.063*** (0.0105)	1.003 (0.0158)	0.950*** (0.0179)	0.812*** (0.00783)	0.821*** (0.0108)	0.818*** (0.0152)	0.972 (0.0233)	0.912** (0.0362)	0.831 (0.144)
<i>One adult with children</i>	1.029 (0.0649)	1.137 (0.130)	1.101 (0.209)	0.888*** (0.0293)	0.746*** (0.0396)	0.615*** (0.0433)	1.461 (0.359)	3.052*** (1.305)	18.00 (34.67)
<i>Couple without children</i>	1.407*** (0.0430)	1.308*** (0.0631)	1.222*** (0.0944)	0.964 (0.0421)	0.782*** (0.0544)	0.735*** (0.0599)	0.852*** (0.0275)	0.799*** (0.0545)	0.459*** (0.108)
<i>Couple with children</i>	1.793*** (0.0609)	1.686*** (0.0904)	1.528*** (0.122)	0.788*** (0.0353)	0.676*** (0.0398)	0.578*** (0.0440)	1.447*** (0.150)	1.349* (0.212)	0.815 (0.354)
<i>Other household structure</i>	0.928** (0.0293)	1.106* (0.0579)	1.043 (0.0854)	0.842*** (0.0323)	0.960 (0.0615)	1.023 (0.107)	0.798*** (0.0426)	0.838** (0.0727)	0.565** (0.156)
<i>Other employed adult(s) in household</i>	1.489*** (0.0358)	1.448*** (0.0631)	1.254*** (0.0833)	1.171*** (0.0421)	1.107* (0.0632)	0.997 (0.0560)	1.697*** (0.101)	1.772*** (0.200)	1.628*** (0.290)
<i>RTI score of occupation</i>	0.817*** (0.0119)	0.856*** (0.0194)	0.832*** (0.0257)	0.901*** (0.0125)	0.899*** (0.0171)	0.863*** (0.0217)	0.727*** (0.0142)	0.687*** (0.0240)	0.656*** (0.0843)
<i>Years since migration</i>			1.036*** (0.00687)			1.071*** (0.0117)			1.064* (0.0374)
<i>Lagged output gap</i>	1.037*** (0.00653)	1.052*** (0.00925)	1.047*** (0.00812)	1.026*** (0.00467)	1.021*** (0.00475)	1.022*** (0.00549)	1.032*** (0.00706)	1.024* (0.0147)	1.013 (0.0265)
<i>Number of obs.</i>	369411	126272	34048	356781	120957	36299	69597	17651	1442

Note: The dependent variable is a dummy variable for whether the individual is in or out of the labor force. Logit regressions including country, region and year fixed effects. Country-year clustered standard errors in parentheses. \* denotes statistically significant at 10 percent, \*\* at 5 percent, \*\*\* at 1 percent.

## REFERENCES

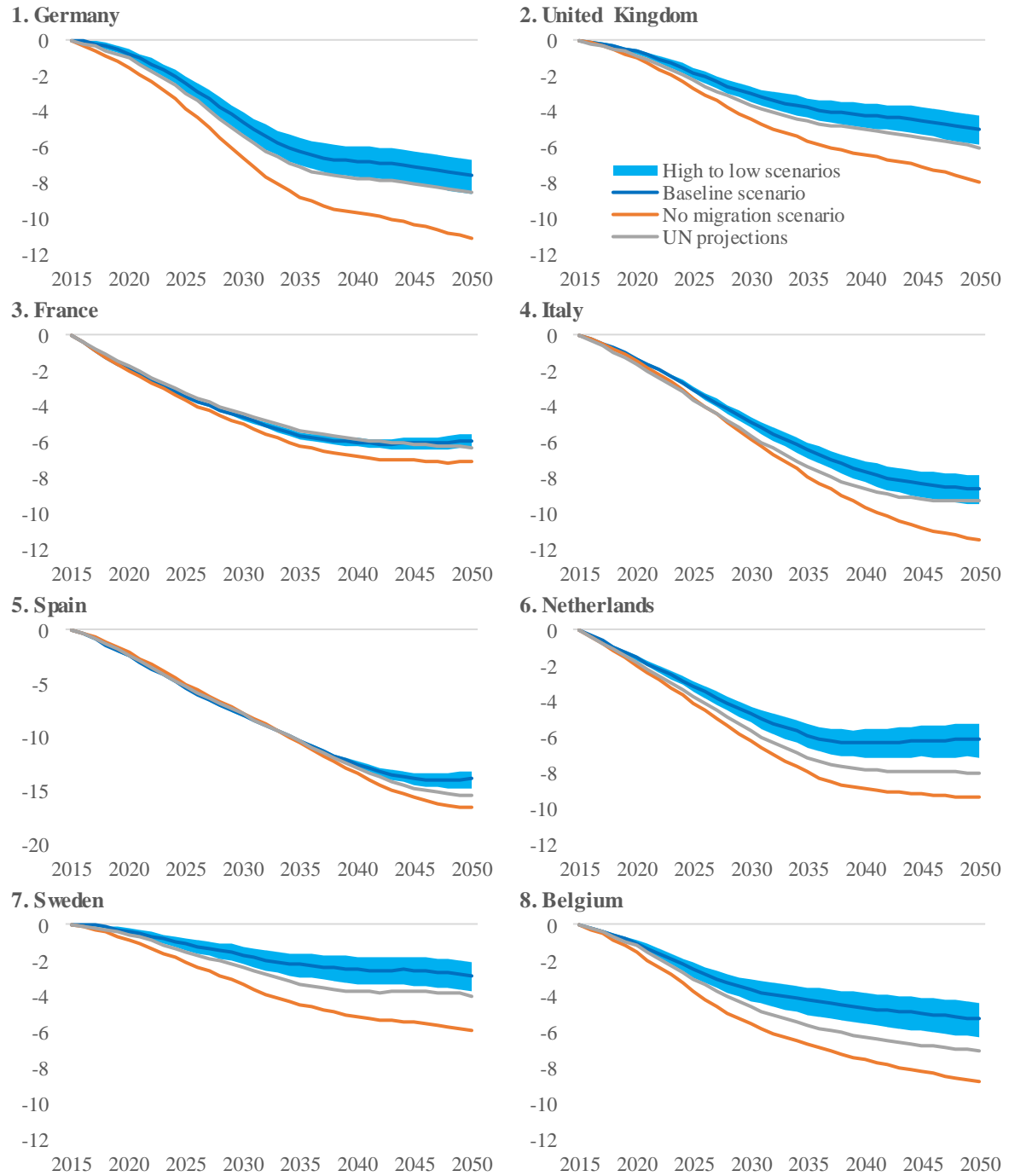
- Abdulloev, Ilhom, Ira N. Gang, and Myeong-Su Yun. 2014. "Migration, Education and the Gender Gap in Labour Force Participation." Discussion Paper No. 8226, Forschungsinstitut zur Zukunft der Arbeit.
- Aiyar, Shekhar, Bergljot Barkbu, Nicoletta Batini, Helge Berger, Enrica Detragiache, Allan Dizioli, Christian Ebeke, Huidan Lin, Linda Kaltani, Sebastian Sosa, Antonio Spilimbergo, and Petia Topalova. 2016. "The Refugee Surge in Europe: Economic Challenges." IMF Staff Discussion Note 16/02, International Monetary Fund, Washington.
- Akgunduz, Yusuf, Marcel van den Berg, and Wolter Hassink. 2015. "The Impact of Refugee Crises on Host Labor Markets: The Case of the Syrian Refugee Crisis in Turkey." IZA Discussion Paper 8841, Institute for the Study of Labor (IZA), Bonn.
- Aldén, Lina, and Matts Hammarstedt. 2014. "Integration of Immigrants on the Swedish Labor Market: Recent Trends and Explanations." Centre for Labour Market and Discrimination Study, Linnaeus University, Växjö, Sweden.
- Alesina, Alberto, Johann Harnoss, and Hillel Rapoport. 2015. "Birthplace Diversity and Economic Prosperity." NBER Working Paper 18699, National Bureau of Economic Research, Cambridge, Massachusetts.
- Beyer, Robert C. M. 2016. "The Labour Market Performance of Immigrants in Germany." IMF Working Paper No. 16/6, International Monetary Fund.
- Borjas, George J. 2017. "The labor supply of undocumented immigrants." *Labour Economics* 46: 1–13.
- Brown, Alexandra, and Rochelle Guttmann. 2017. "Ageing and Labour Supply in Advanced Economies." Reserve Bank of Australia.
- Card, David. 1990. "The Impact of the Mariel Boatlift on the Miami Labor Market." *Industrial and Labor Relations Review* 43 (2): 245–57.
- Cattaneo, Cristina, Carlo V. Fiorio, and Giovanni Peri. 2015. "What Happens to the Careers of European Workers When Immigrants 'Take Their Jobs?'" *Journal of Human Resources* 50 (3): 655–93.
- Carrasco, Raquel, Juan F. Jimeno, and A. Carolina Ortega. 2005. "The Effect of Immigration on Labor Market Performance of Native-Born Workers: Some Evidence for Spain." Center for Research & Analysis of Migration (CReAM).

- Cully, Mark. 2011. "How much do migrants account for the unexpected rise in the labour force participation rate in Australia over the past decade?" Paper, Australian Conference of Economists.
- D'Amuri, Francesco, and Giovanni Peri. 2014. "Immigration, Jobs, and Employment Protection: Evidence from Europe before and during the Great Recession." *Journal of the European Economic Association* 12 (2): 432–64.
- Das, Mitali, and Benjamin Hilgenstock. Forthcoming. "Labor Market Consequences of Routinization in Developed and Developing Economies." IMF Working Paper, International Monetary Fund, Washington, DC.
- European Commission, 2017. Technical Note: Summary Methodology of the 2015-based Population Projections.
- Farré, Lidia, Libertad González, and Francesc Ortega. 2011. "Immigration, Family Responsibility and the Labor Supply of Skilled Native Women." *B.E. Journal of Economic Analysis & Policy* 11 (1), Article 34.
- Gelatt, Julia, Jeanne Batalova, and B. Lindsay Lowell. 2006. "Immigrants and Labor Force Trends: The Future, Past, and Present." Policy Briefs, Migration Policy Institute.
- Hanson, Gordon H. 2007. "Emigration, Remittances and Labor Force Participation in Mexico." Working Paper 28, INTAL – ITD.
- Holland, Jennifer A., Helga A. G. de Valk. 2017. "Differences in labour force participation by motherhood status among second-generation Turkish and majority women across Europe." *Population Studies: A Journal of Demography* 71(3): 363–78.
- Holzmann, Robert. 2005. "Demographic Alternatives for Aging Industrial Countries: Increased Total Fertility Rate, Labour Force Participation, or Immigration." SP Discussion Paper No. 0540, The World Bank.
- Hunt, Jennifer, and Marjolaine Gauthier-Loiselle. 2010. "How Much Does Immigration Boost Innovation?" *American Economic Journal: Macroeconomics* 2 (2): 31–56.
- International Monetary Fund. 2015. "International Migration: Recent Trends, Economic Impacts, and Policy Implications." Staff Background Paper for G20 Surveillance Note. Washington.
- International Monetary Fund. 2018. "United Kingdom: Staff Report for the 2017 Article IV Consultation" Washington.

- Jaumotte, Florence, Ksenia Koloskova, and Sweta C. Saxena. 2016. "Impact of Migration on Income Levels in Advanced Economies." Spillover Note 8, International Monetary Fund, Washington.
- Karymshakov, Kamalbek, and Burulcha Sulaimanova. 2017. "Migration impact on left-behind women's participation and time-use: Evidence from Kyrgyzstan." WIDER Working Paper 2017/119, United Nations University.
- Khan, M. Imran, and C. Valatheeswaran. 2016. "International Migration, Remittances and Labour Force Participation of Left-behind Family Members: A Study of Kerala." *Margin – The Journal of Applied Economics Research* 10(1): 86–118.
- Khoudja, Yassine, and Fenella Fleischmann. 2017. "Labor Force Participation of Immigrant Women in the Netherlands: Do Traditional Partners Hold Them Back?" *International Migration Review* 51(2): 506–41.
- Kok, Suzanne, Nicole Bosch, Anja Deelen, and Rob Euwals. 2011. "Migrant Women and the Labour Market: One the Role of Home- and Host-Country Participation." Discussion Paper 180, CPB Netherlands Bureau for Economic Policy Analysis.
- Münz, Rainer. 2008. "Migration, Labor Markets, and Integration of Migrants: An Overview for Europe." SP Discussion Paper No. 0807, The World Bank.
- Nichols, Austin, Steven Martin, Nan Marie Astone, H. Elizabeth Peters, Rolf Pendall, Kaitlin Franks Hildner, and Allison Stolte. 2015. "The Labor Force in an Aging and Growing America." *Mapping America's Futures*, Brief 4, Urban Institute.
- Orrenius, Pia M., and Madeline Zavodny. 2013. "Immigrants in the U.S. Labor Market." Working Paper 1306, Federal Reserve Bank of Dallas.
- Ortega, Francesc, and Giovanni Peri. 2014. "Openness and Income: The Role of Trade and Migration." *Journal of International Economics* 92: 231–51.
- Ott, Eleanor. 2013. "The Labour Market Integration of Resettled
- Peri, Giovanni, and Chad Sparber. 2009. "Task Specialization, Immigration, and Wages." *American Economic Journal: Applied Economics* 1(3): 135–69
- Peri, Giovanni, Kevin Shih, and Chad Sparber. 2015. "STEM Workers, H-1B Visas, and Productivity in US Cities." *Journal of Labor Economics* 33 (3): S225–55.
- Peri, Giovanni. 2014. "Do Immigrant Workers Depress the Wages of Native Workers?" *IZA World of Labor* 2014: 42.

- Rubin, Jennifer, Michael S. Rendall, Lila Rabinovich, Flavia Tsang, Constantijn van Oranje-Nassau, and Barbara Janta. 2008. "Migrant women in the European labour force: Current situation and future prospects." RAND Technical Report, RAND Corporation.
- Smits, Jeroen. 1999. "Family migration and the labour-force participation of married women in the Netherlands, 1977–1996." *Population, Space and Place* 5(2): 133–150.
- United Nations, 2017. *World Population Prospects: Methodology of the United Nations Population Estimates and Projections, 2017 Revision*.
- Wang, Qing. 2013. "Male Migration and Female Labor Force Participation: New Evidence from the Mexican Family Life Survey." Peking University HSBC Business School.

**Appendix Figure 1. Change in Labor Force Participation Rates Relative to 2015**  
(Percentage points)



Sources: Eurostat; United Nations; and authors' calculations.