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January 2025



# Employment and Social Developments in Europe

*January 2025*

The Employment and Social Developments Quarterly Review provides an in-depth analysis of recent labour market and social developments. It is prepared in the Directorate “Employment and Social Governance, Analysis” of the Directorate-General for Employment, Social Affairs and Inclusion by the Analysis and Statistics Unit. The main contributors for part I are Gaelle Debree and Marieke Delanghe. The main contributor for part II is Eva Schönwald.

A wide range of information sources were used to produce this report, including Eurostat statistics<sup>1</sup>, reports and survey data from the Commission’s Directorate-General for Economic and Financial Affairs as well as EU-LFS scientific use files.

Charts and tables in part I are based on the latest available data at the time of publication and include among others Eurostat data on national accounts (employment and GDP) and the Labour Force Survey for the third quarter of 2024, and monthly unemployment for November 2024. Data on which the report is based are the latest available as of 08/01/2025.

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<sup>1</sup> Data come from Eurostat database unless otherwise stated: <https://ec.europa.eu/eurostat/>

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## Introduction

In the third quarter of 2024, the EU economy continued expanding, with GDP growing at 0.4%, in a context of easing inflation. For 2025, the European Commission's Autumn Economic Forecast<sup>2</sup> projects annual growth to reach 1.5%. Meanwhile, inflation is expected to slow down further to 2.4% in 2025, notably with a moderation of non-energy goods and food prices.

In the labour market, the employment growth rate displayed a mild slowdown, from 0.9% in Q2 2024 to 0.7% in Q3 2024, in a context of subdued economic growth and lower employers' confidence. By the third quarter of 2024, eight Member States had already reached their 2030 employment national targets (up from five in 2023) and the employment rate attained an historically high level, at 75.9%. The employment rate rose for older workers and women, although the gender employment gap remains unchanged from the second quarter of 2024. Overall, the labour market is experiencing an easing of labour shortages (albeit levels remain high) as shown by a decrease in the unmet labour demand to 2.3% (from 2.4% in Q2 2024). Such easing is a result of a growing labour force as reflected by an increase in the participation rate (from 75.1% in Q2 to 75.4% in Q3 2024), against a record low unemployment rate, at 5.9% in November 2024.

The financial situation of households continued to improve in the second quarter of 2024, with the real gross disposable income (GDHI) standing 2.7% above its level in the same quarter of 2023. This goes along with declining shares of households reporting financial distress, albeit, at 15.7% in November 2024, levels remain significant, especially for the households in the lowest income quintile.

The thematic part of this review focuses on the overqualification of workers born outside the EU as well as factors that affect their overqualification. The analysis shows that migrants are more likely to be overqualified than people born in the EU, with a higher probability for women and those with poor language skills. Host country education significantly reduces the risk of overqualification of workers born outside the EU, with recognition of qualifications remaining a key barrier to migrants' full integration into the EU labour market. Efforts to address overqualification need to consider multiple, intersecting barriers for different population groups.

## Main economic and social developments

### 1. Macroeconomic outlook

**In the third quarter of 2024, real GDP in the EU grew by 0.4% compared to the previous quarter, and by 1.0% compared to the same quarter of 2023.** The EU economic growth was lower compared to the US, where the GDP expanded by 0.8% in the third quarter of 2024, and by 2.7% over the last year (Chart 1). It was also below China's GDP growth rate<sup>3</sup> (0.9% quarter-to-quarter, 4.6% year-on-year), but expanded at a higher pace than Japan's GDP (0.3% quarter-to-quarter and 0.5% on an annual basis) in the third quarter of 2024. The 2024 European Commission's Autumn economic forecast<sup>4</sup> projects the EU's real GDP to grow by 0.9% in 2024, and 1.5% in 2025, as consumption and investment are expected to expand, favoured by continued employment and wage growth. Together with a positive economic growth, the EU's headline inflation rate sharply declined from 6.4% in 2023 to 2.6% in 2024, also as a result of an accommodating monetary policy. Disinflation is expected to continue further, albeit at a slower pace, with a forecasted inflation rate at 2.4% in 2025, and 2.0% in 2026. According to the Autumn economic forecast, inflation easing will be supported by a moderation of prices of non-energy industrial goods, as well as food prices. On the other hand, energy deflation in the EU slowed down from -4.7% in September 2024 to -3.3% in October 2024 (-6.1% to -4.6% in

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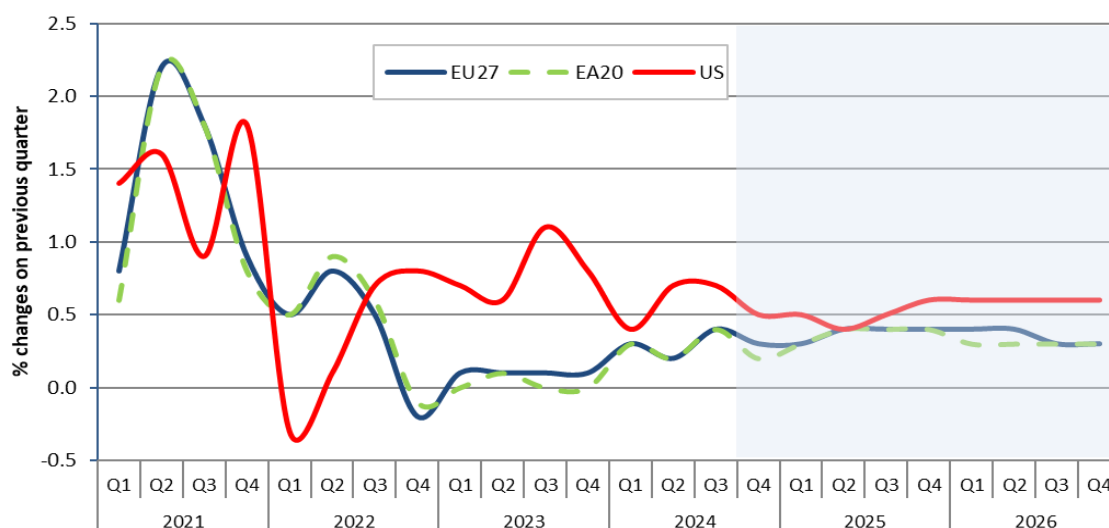
<sup>2</sup> European Commission Autumn Economic Forecast 2024

<sup>3</sup> GDP growth rates for China have been extracted from the National Bureau of Statistics of China, [https://www.stats.gov.cn/english/PressRelease/202410/t20241025\\_1957137.html](https://www.stats.gov.cn/english/PressRelease/202410/t20241025_1957137.html)

<sup>4</sup> European Commission Autumn Economic Forecast 2024

the euro area)<sup>5</sup>, driven by increasing oil prices and strong base effects<sup>6</sup>. Despite this, energy inflation is projected to have a negligible impact on headline inflation, except from a slight pick-up in 2026.

**Chart 1: Real GDP growth – EU, euro area and US**



Source: Eurostat, National Accounts, seasonally and calendar adjusted data [namq\_10\_gdp, naidq\_10\_gdp]. European Commission Autumn forecast for 2024 Q4 onwards.

Notes: Forecast from 2024 Q4 onwards in the shaded area.

## 2. Employment

**In the third quarter of 2024, employment reached new records in the EU, bringing the EU closer to its employment rate headline target of at least 78.0% for 2030.** In this quarter, 219.1 million people were employed in the EU, an increase of 1.49 million persons compared to the same quarter of 2023<sup>7</sup>. The employment rate of people aged 20 to 64 reached a historic level of 75.9% (+0.1 pp quarter-on-quarter)<sup>8</sup>, and eight Member States already attained their 2030 national target<sup>9</sup>. Employment is projected to continue growing in the next years, albeit at a slower pace<sup>10</sup>, as already observed in the third quarter of 2024, with the EU annual employment growth rate declining to 0.7%, from 0.9% in the previous quarter, and from 1.1% in the same quarter of 2023. However, the total number of hours worked decreased slightly in the third quarter of 2024 and the number of hours worked per person remains below the pre-COVID-19 level. This decline largely reflects the introduction of more efficient and productive technologies, as well as changes in workers' needs, as highly qualified workers prefer to reduce their weekly hours. More broadly, significant reductions in average hours worked have been observed among young people, men, and men with young children, as well as in European countries with longer initial average hours and higher GDP per capita growth rates<sup>11</sup>.

**Developments in the EU employment rate can be mostly attributed to increasing employment rates for women and older workers.** The employment rate for women aged 20 to 64 attained a record high of 70.9%, up by 0.1 pp from the previous quarter, and by 1.2 pp from the same quarter of the previous year (Chart 2). Despite this progress, the gender employment gap remains unchanged at 10.0 pp, as men's

<sup>5</sup> Inflation rate is expressed as an annual rate of change.

<sup>6</sup> This is reflected in the monthly rate of change of energy prices, which increased by 0.4% in both the EU and the euro area in October 2024 (compared to September 2024).

<sup>7</sup> Employment levels are derived from national accounts (namq\_10\_pe)

<sup>8</sup> Employment rates are based on the Labour Force Survey (lfsi\_emp\_q)

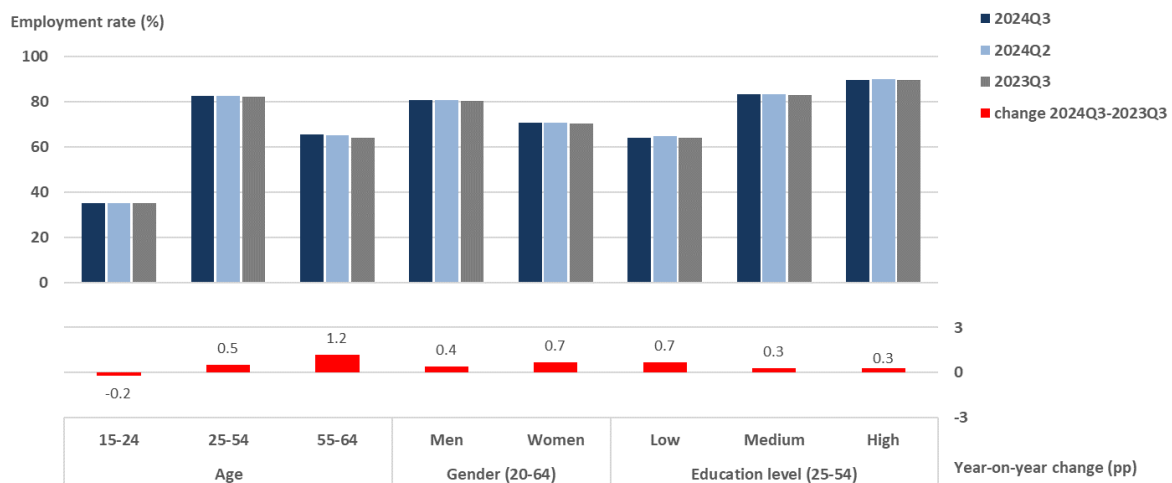
<sup>9</sup> The Netherlands, Czechia, Estonia, Ireland, Denmark, Cyprus, Poland, and Slovakia.

<sup>10</sup> European Commission Autumn Economic Forecast 2024

<sup>11</sup> European Commission (2024), Labour market and wage developments in Europe, Publications Office of the European Union, <https://data.europa.eu/doi/10.2767/888580>

employment rate also increased by 0.1 pp from the previous quarter. Older workers<sup>12</sup> saw their employment rate rise by 0.3 pp over the last quarter (+1.2 pp year-on-year) to reach 65.4%, reflecting an increasing participation rate, as statutory retirement ages and life expectancy have been extended, healthcare is improving, and retention rates as well as share of jobs in the service sector – which are less physically demanding – have been rising<sup>13</sup>. This development mirrors a long-term improvement, with older workers' labour market participation and employment rates standing roughly 20.0 pp above their 2009 levels<sup>14</sup>. On the other hand, the employment rate for low-educated workers aged 25 to 54 fell to 64.2% in Q3 2024, down by 0.5 pp from the previous quarter, although it remains 0.7 pp higher than in the same quarter of 2023. In parallel, both part-time and temporary contracts as a share of total employment remained stable at 17.2% and 10.0% respectively (-0.1 pp for both quarter-to-quarter). In 2023, 20.0% of total part-time employment is still involuntary<sup>15</sup> and 6.9% of all employees aged 15 to 64 hold an involuntary temporary contract<sup>16</sup>. Managers' employment expectations, measured by the Employment Expectations Indicator (EEI), slightly declined but remained at 98.4 in December 2024, down from 99.4 in November 2024. Such trend echoes less optimistic employment plans in industry, services and construction sectors, and a slight improvement across retail trade managers. This was accompanied by a decrease in the Economic Sentiment Indicator (ESI)<sup>17</sup>, driven by lower confidence in industry, construction as well as among consumers.

**Chart 2: Employment rate by population group - EU**



Source: Eurostat, LFS [lfsi\_educ\_q]. Data seasonally adjusted.

Notes: age groups are indicated between parentheses for gender and educational level groups. Education levels represent ISCED levels of educational attainment: low stands for ISCED 0-2, medium for ISCED 3-4 and high for ISCED 5-8.

### 3. Unemployment

**The EU unemployment rate remained at record low levels in November 2024, accompanied by diminishing long-term and very long-term unemployment rates.** In November 2024, 5.9% of the population aged 15 to 74 in the labour force was unemployed, stable compared to the previous month, but 0.2 pp lower than in November 2023 (Chart 3). With an unemployment rate at 6.1% for women and 5.7% for men, the gap between men and women remained the same as in October 2024 (0.4 pp), but it was down from 0.5

<sup>12</sup> 'Older workers' stand for people aged 55 to 64 years old.

<sup>13</sup> European Commission (2024), [Proposal for a Joint Employment Report](#)

<sup>14</sup> European Commission (2024), Labour market and wage developments in Europe, Publications Office of the European Union, <https://data.europa.eu/doi/10.2767/888580>

<sup>15</sup> Involuntary part-time employment stands for respondents reporting working part-time because they are unable to find full-time work.

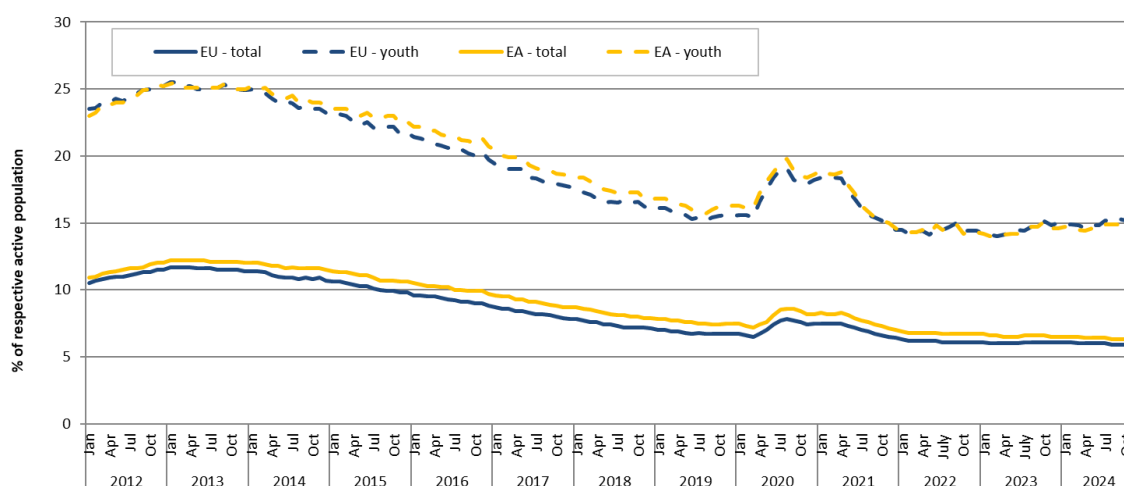
<sup>16</sup> Involuntary temporary employment represents respondents reporting holding a temporary contract because they did not find a permanent job or because the job was only available with a temporary contract.

<sup>17</sup> Indicator published as part of the EU Business and Consumer Surveys. It combines judgements and attitudes of producers and consumers by means of a weighted aggregation of standardised input series.

pp year-on-year. Along with low unemployment levels, long-term and very long-term unemployment rates stood at 1.9% and 1.0% respectively, declining from 2.1% and 1.2% reported in the previous year.

**Although the NEET rate is decreasing, the youth unemployment rate still significantly exceeds the overall average unemployment rate.** The youth unemployment rate, i.e. of people aged less than 25, stood at 15.3% in November 2024, slightly up from 15.2% in October, but still 0.5 pp less than in November 2023 (Chart 3). Furthermore, the share of young people aged 15 to 29 and who are neither in employment nor in education and training (NEET) slightly declined to 10.9% in the third quarter of 2024 (-0.1 pp on a quarterly basis, and -0.3 pp on a yearly basis). This goes along with a slight increase of the youth labour market participation rate to 41.3% in the third quarter of 2024, up from 41.2% in the previous quarter and third quarter of 2023.

**Chart 3: Unemployment rate and youth unemployment rate – EU and euro area**



Source: Eurostat, series on unemployment [une\_rt\_m]. Seasonally adjusted data.

#### 4. Additional developments in the labour force and labour demand

**The EU labour market participation rate of people aged 15 to 64 remained at 75.4% in the third quarter of 2024.** With a labour market participation rate at 80.1% for men and 70.7% for women (+0.1 pp and -0.1 pp compared to the previous quarter, respectively), the gender gap increased to 9.4 pp from its lowest level ever (9.2 pp) observed in the second quarter of 2024. Moreover, the total unmet demand for work in the EU – measured by the labour market slack indicator<sup>18</sup> – remained stable compared to the previous quarter, representing 11.7% of the extended labour force<sup>19</sup>. On an annual basis, the total unmet demand for work dropped by 0.3 pp, driven by declining rates of people available to work but not seeking a job (-0.1 pp to 2.7%) and of underemployed people (-0.1 pp to 2.3%), i.e. part-time workers who would like to work more. The proportion of people seeking a job but not available for work remained unchanged at 0.9%.

**Labour shortages eased slightly as the job vacancy rate declined and labour hoarding increased.** In the third quarter of 2024, the level of unmet labour demand – expressed by the job vacancy rate and used as a proxy for labour shortages – decreased to 2.3%, a reduction of 0.1 pp quarter-on-quarter, and of 0.5 pp year-on-year, echoing weaker economic growth and reduced hiring plans<sup>20</sup> (Chart 4). Relatively to the previous

<sup>18</sup> This indicator measures the whole potential demand for employment. As it includes people outside the labour force ('people who are available to work but are not looking for work' and 'people who are looking for work but are not available for work'), it is computed as share of the extended labour force, which incorporates them. More methodological details can be found at: [https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Labour\\_market\\_slack\\_-\\_unmet\\_need\\_for\\_employment\\_-\\_quarterly\\_statistics](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Labour_market_slack_-_unmet_need_for_employment_-_quarterly_statistics)

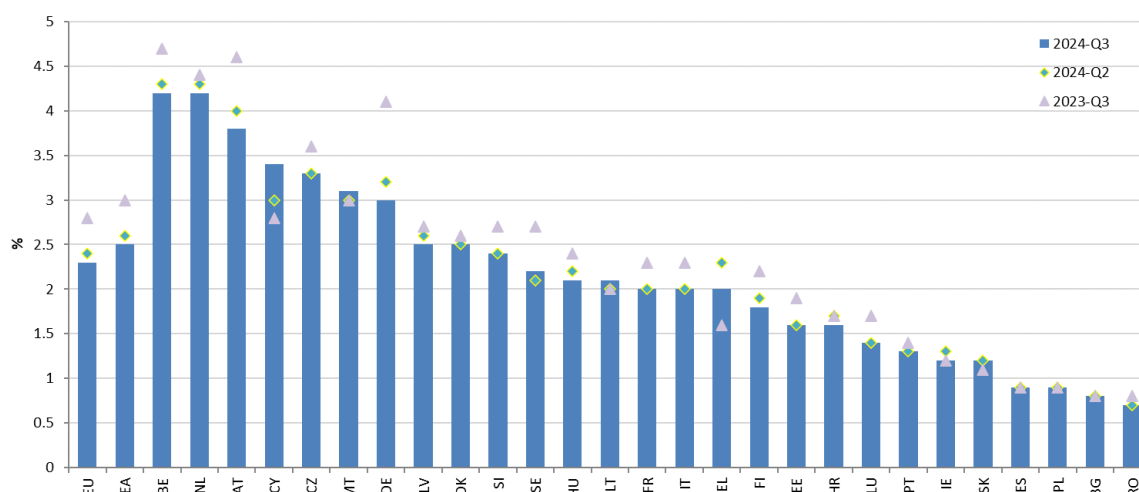
<sup>19</sup> The extended labour force consists of the labour force (unemployed and employed) and of the potential additional labour force (the two categories outside the labour force, i.e. those available but not seeking, and those seeking but not available).

<sup>20</sup> European Commission (2024), *Proposal for a Joint Employment Report*



quarter, the job vacancy rate decreased or remained stable in almost all sectors of the business economy<sup>21</sup>, declining the most in ‘Accommodation and food service activities’ (-0.5 pp) and ‘Construction’ (-0.3 pp) sectors<sup>22</sup>. In addition, labour shortages<sup>23</sup> are easing in the EU, especially in the industry sector where their indicator fell by 0.4 pp quarter-on-quarter (-4.7 pp year-on-year), while the labour shortages indicator for services slightly increased by 1.0 pp, but is 3.7 pp lower than in the fourth quarter of 2023. In a context of subdued growth, this easing can be attributed to decreasing labour demand and a simultaneous growing labour force, and especially to a continuous rise of non-EU citizens as a share of the additional labour force, accounting for 64.1% of it in 2023.<sup>24</sup> This was accompanied by an increasing share of companies retaining their labour despite expected output decreases, also referred to as labour hoarding<sup>25</sup>, standing at 10.0% in December 2024, 0.6 pp higher than in the previous month, but 0.7 pp lower than in December 2023. Compared to the previous month, labour hoarding increased in all sectors: construction (+1.4 pp to 14.9%), retail (+0.8 pp to 14.4%), industry (+0.5 pp to 9.3%), and services (+0.4 pp to 7.2%), remaining particularly high in construction and retail sectors in December 2024. Although labour shortages have been easing, they remain above the pre-COVID average of 1.7% and still reflect challenges related to demographic change, the demand for new skills linked to technological developments and the twin transition, and poor working conditions in some sectors<sup>26</sup>.

**Chart 4: Job vacancy rate – EU, euro area and Member States**



Source: Eurostat, Job Vacancy Statistics [jvs\_q\_nace2]. Seasonally adjusted data

Notes: Job vacancy rate = vacancies / (vacancies + occupied posts); NACE rev2 B-S Industry, construction, and services (except activities of households as employers and extra-territorial organisations and bodies) for all Member States except DK (NACE rev 2 B-N Business economy); Firm size > 10 for FR.

## 5. Income and financial situation of households

**In the EU, real Gross Disposable Household Income (GDHI) continued to grow significantly, at a higher pace than real GDP.** During the second quarter of 2024, real GDHI was 2.7% above the level observed in the same quarter of 2023. This performance was mostly driven by the compensation of employees and self-

<sup>21</sup> Business economy stands for all NACE2 sectors from B to N, excluding sector A (Agriculture, forestry and fishing) and sectors O to S (Public administration and defence; compulsory social security; education; human health and social work activities; arts, entertainment, and recreation; other service activities).

<sup>22</sup> Job vacancy rates by NACE2 sector are unadjusted, due to the unavailability of seasonally or calendar adjusted data.

<sup>23</sup> Indicator published as part of the EU Business and Consumer Surveys. It represents the share of respondents who report labour as a factor limiting their production or business.

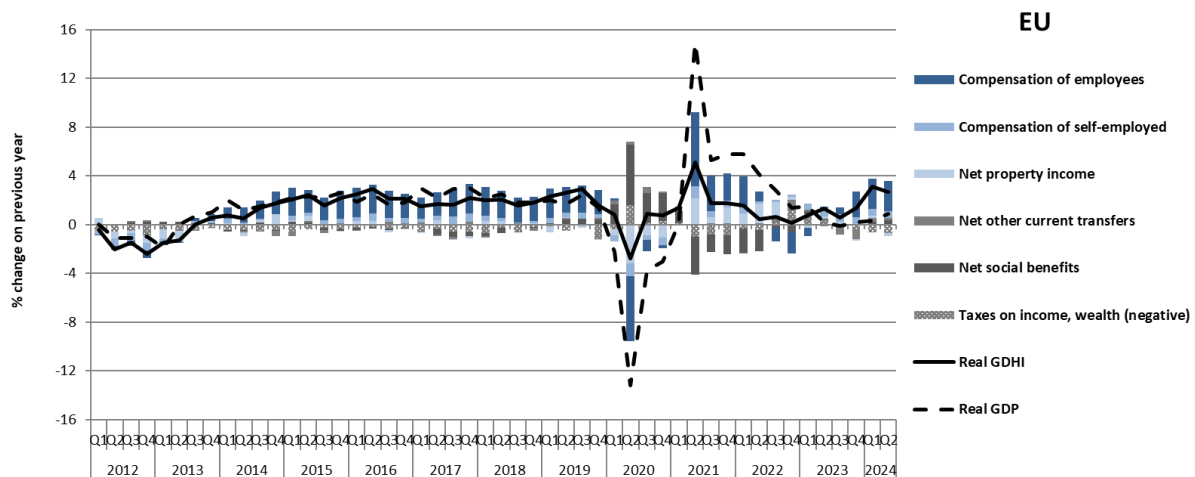
<sup>24</sup> European Commission Autumn Economic Forecast 2024 ; European Commission (2024), Labour market and wage developments in Europe, Publications Office of the European Union, <https://data.europa.eu/doi/10.2767/888580>

<sup>25</sup> Indicator published as part of the EU Business and Consumer Surveys. It reflects the share of firms which expect their output to decrease, but their employment to increase or remain unchanged.

<sup>26</sup> European Commission (2024), Proposal for a Joint Employment Report

employed<sup>27</sup> (+2.5 pp and +0.5 pp year-on-year, respectively), followed by increasing net social benefits (+ 0.4 pp year-on-year) (Chart 5). Real GDHI growth was supported by a robust labour market and recovery in real wages in a context of robust nominal wage growth and lower inflation, allowing the purchasing power of wages to recover nearly half of the loss that resulted from high inflation<sup>28</sup>.

**Chart 5: Real GDP growth, real GDHI growth and its main components**



Source: Eurostat, National Accounts, unadjusted data [namq\_10\_gdp, nasq\_10\_nf\_tr] (DG EMPL F.4 calculations)

Note: The nominal GDHI is converted into real GDHI by deflating with the deflator (price index) of household final consumption expenditure. Compensation of self-employed = Operating surplus and mixed income, gross (na\_item = B2A3G).

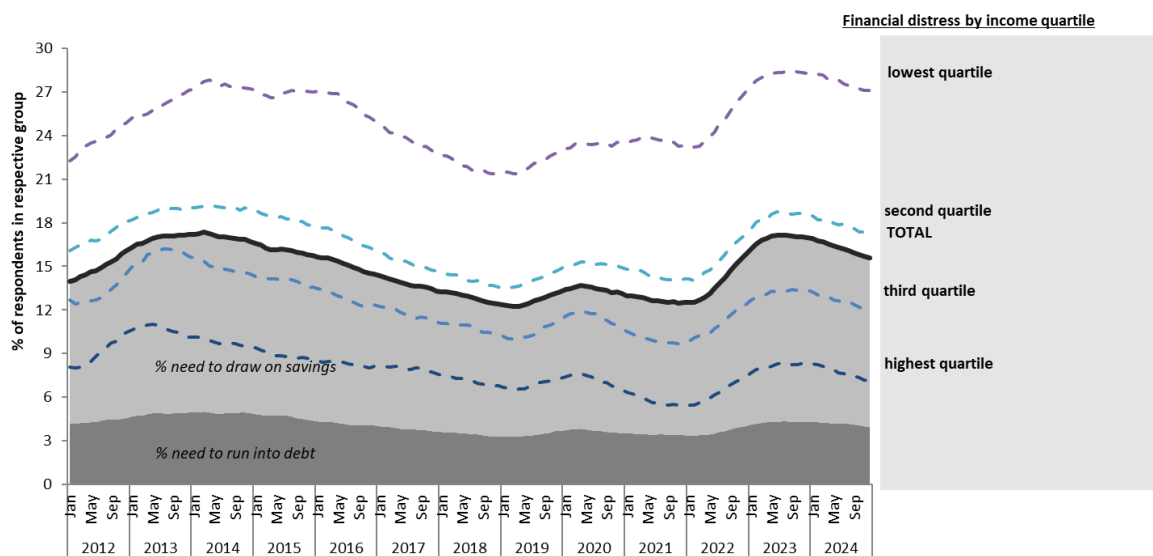
**In the context of easing inflation, the proportion of households reporting financial distress<sup>29</sup> continued decreasing in all income quartiles on an annual basis but remained particularly high for the most economically disadvantaged.** From a peak of 17.2% in August 2023, the share of households experiencing financial distress gradually declined to 15.6% in December 2024, 0.1 pp lower than in November 2024, and 1.4 pp below its level of December 2023. Yet, the indicator remained particularly high for the lowest income quartile (27.1%, -1.2 pp year-on-year), i.e. approximately 10 pp or more above any other income quartile. Likewise, the share of people reporting having to draw on savings reached 11.6% in December 2024 (-1.1 pp on a yearly basis) whereas 4.0% reported the need to run into debt (-0.3 pp compared to the same month of the previous year) (Chart 6).

<sup>27</sup> As compensation of self-employed is here considered the operating surplus and mixed income, gross.

<sup>28</sup> European Commission Autumn Economic Forecast 2024 ; European Commission (2024), Labour market and wage developments in Europe, Publications Office of the European Union, <https://data.europa.eu/doi/10.2767/888580>

<sup>29</sup> Defined as the perceived need to draw on savings or to run into debt to cover current expenditures, moving average over 12 months. For details on Business and Consumer Surveys, including consumer survey's question on the current financial situation of households, see [https://economy-finance.ec.europa.eu/economic-forecast-and-surveys/business-and-consumer-surveys\\_en](https://economy-finance.ec.europa.eu/economic-forecast-and-surveys/business-and-consumer-surveys_en)

**Chart 6: Reported financial distress by income quartile – EU, 2012-2024**



Source: European Commission, Business and Consumer Surveys. 12-months moving average (DG EMPL F.4 calculations)

Note: Lines show the long-term averages for financial distress for the population as a whole and for households in the four income quartiles. The overall share of adults reporting having to draw on savings and having to run into debt are shown respectively by the light grey and dark grey areas, which together represent total financial distress.

## Thematic focus: Patterns of overqualification among migrants

### 1. Introduction

**Overqualification occurs when a person’s formal qualifications exceed the requirements of the job performed, leading to a vertical skills mismatch.**<sup>30</sup> Over-qualified people are persons with a tertiary level of educational attainment (ISCED 5-8) who are employed in low- or medium-skilled occupations (ISCO 4-9).<sup>31</sup> In 2023, 21.9% of persons working in the EU had jobs not fitting their education level.<sup>32</sup> This ranges from 5.4% in Luxembourg to 35.8% in Spain.

**High rates of overqualification point to an inefficient allocation of labour which can negatively impact labour supply.** A high share of overqualification among the tertiary-educated indicates that there may be an inefficient allocation of labour at the macro level and underutilised potential. It also translates into lower marginal returns to education through lower wages over the lifecycle.<sup>33</sup> Being overqualified for the job can also lead to lower motivation and less labour supply, negatively affecting participation in the labour market.<sup>34</sup> Prolonged situations of overeducation may also lead to a deterioration of skills not used and can limit firms’ innovation potential.<sup>35</sup> Overqualification is particularly high among tertiary-educated migrants, motivating the analysis below to understand factors that affect this gap.

### 2. Migrants in the EU labour force

**In 2023, 42.4 million EU residents born outside the EU (henceforth “migrants”).** In absolute terms, the largest numbers of migrants living in the EU Member States on 1 January 2023 resided in Germany (12.3 million), Spain (6.1 million), France (5.6 million) and Italy (5.1 million).<sup>36</sup> In 2024, around 4 million migrants were Ukrainian refugees who received temporary protection status in the EU, a large share of them residing in Germany (27%), Poland (23%) and Czechia (9%).<sup>37</sup>

**On average, those born outside the EU have worse labour market outcomes than the native-born population.** About 32 million migrants are aged 20-64. The employment rate for migrants in the 20-64 age group was 67%, compared to 76.3% for those born in their country of residence (subsequently “native-born”). While 30.9% of persons born outside the EU have a tertiary education degree compared to 35.8% of native-born,<sup>38</sup> a larger share of migrants also works in lower-skilled occupations.<sup>39</sup>

**Overqualification rates differ substantially when considering migration patterns.** This report refers to migrants, as persons who were born outside the EU, irrespective of whether they hold the citizenship of a third country or of an EU Member State. Hence, it does not focus on persons born in a different EU Member State than the country they are employed in, who are defined as ‘EU mobile workers’. The latter face at times different barriers and have lower overqualification rates than persons born outside the EU. For the same reasons, and in particular given the significantly lower overqualification rates (Chart 7), the analysis also excludes children born in the country of residence to migrant parents (second generation migrants). Among

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<sup>30</sup> See definition of ‘overqualification’ provided by ILO (2018) and OECD (2023).

<sup>31</sup> The definition of overqualification follows the concept used by Eurostat [lfsa\_eoqgan] and OECD (2023).

<sup>32</sup> Eurostat [lfsa\_eoqgan]

<sup>33</sup> Often migrants’ tertiary education degrees are not recognised, forcing them to work in occupations not matching their field of education (horizontal skills mismatch) or in occupations not requiring tertiary education.

<sup>34</sup> High rates of overqualification are not only a labour supply issue but can also stem from structural labour market issues. Factors affecting labour demand need to also be considered when addressing skills mismatches.

<sup>35</sup> OECD 2023, Baran 2024.

<sup>36</sup> Within Germany, migrants are predominantly from Turkey, Ukraine and Syria (between 11% and 7% of total migrants in the country), while for Spain, France and Italy a large share of migrants is from Morocco (between 12% and 8%), Algeria (11% in France), Colombia (around 9% in Spain) and Albania (around 8% in Italy).

<sup>37</sup> Temporary protection for 4.2 million people in November - News articles - Eurostat

<sup>38</sup> Age 25-64, Eurostat [edat\_lfs\_9912].

<sup>39</sup> European Commission (2023).



persons aged 20 to 64, 80.5% of those born in their country of residence were part of the labour force in 2023, compared to 74.9% of those born outside the EU, a gap of 5.6 percentage points. Looking at those in the labour market, the gap in employment rates between migrants and native-born reached 9.3pp in 2023.<sup>40</sup>

**Job quality and employment conditions tend to be worse for migrants.** Migrant workers are more likely to have difficulties in finding permanent or full-time employment, and report high levels of discrimination when in employment. Migrants are also more often employed in occupations facing persistent labour shortages or are projected to experience strong labour shortages in the future, some of which are characterised by higher-than-average job strain. Among occupations characterised by persistent labour shortages, the majority of migrants are concentrated in lower-skilled occupations.<sup>41</sup>

### 3. *Overqualification among migrants in the EU*

**In most EU countries, a higher share of tertiary-educated migrants have jobs not fitting their education level than among the native-born population.** In 2023, 34.9% of tertiary-educated migrants aged 20-64 were employed in occupations for which a tertiary education level is not required, compared to 20.3% among the native-born population. While the overqualification rate differs substantially between Member States, from 23.9% in the Netherlands to 54% in Italy, the share of overqualified persons is higher among migrants in all Member States for which data is available (Chart A.1). Women are on average more overqualified than men both among migrants and native-born, with the gap between migrant women and women born in the host country (15.9pp.) being slightly larger than between migrant and native-born men (13.2pp).<sup>42</sup> Similar differences in overqualification rates are evident when comparing migrants to their second-generation children - born in the reporting country to two foreign-born parents; this suggests that the differences in overqualification rates between migrants and native-born are substantially reduced or in some subgroups even completely remedied within one generation (Chart 7)<sup>43</sup>. Second generation migrants tend to, for instance, have a higher level of proficiency in the local language and have received their educational qualifications in the host country. Given the high levels of overqualification among first generation migrants in particular, the analysis below focuses on those born outside the EU exclusively.

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<sup>40</sup> Eurostat [lfsa\_argacob, lfsa\_ergacob].

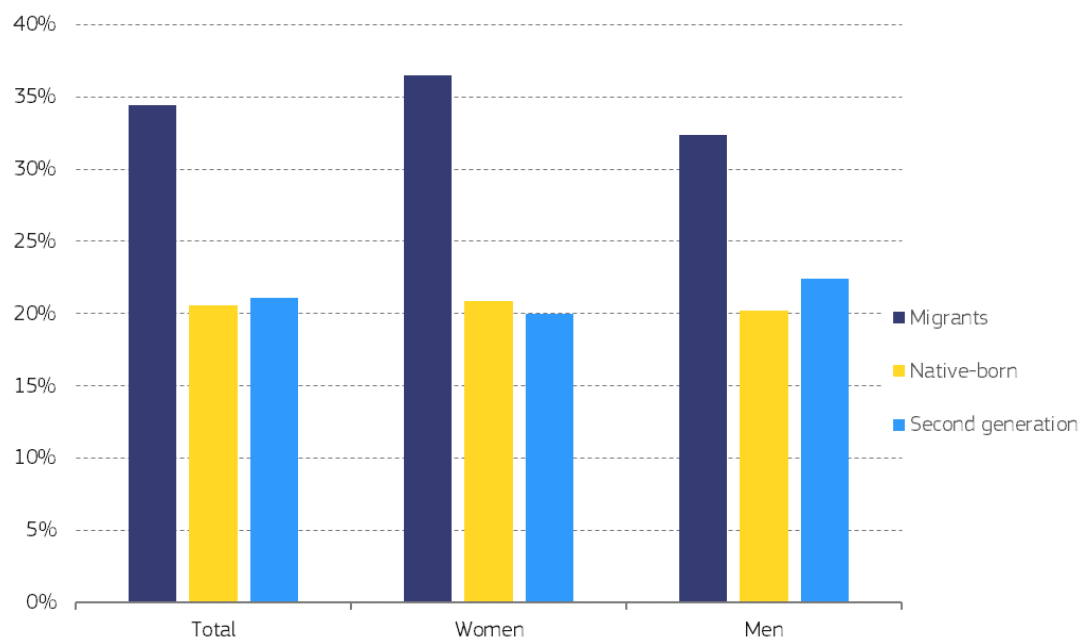
<sup>41</sup> European Commission (2023).

<sup>42</sup> Eurostat [lfsa\_eoqgac].

<sup>43</sup> As microdata for 2023, needed to analyse second-generation migrants, was not available at the time of writing, data is shown for 2021 in line with the analysis conducted on the LFS ad-hoc module below.

### Chart 7: Overqualification rates are higher among migrants

Rate of overqualification by migration background, EU, 2021



Source: Author's calculations, LFS 2021.

Note: Second generation refers to persons born in the reporting country but with both parents born outside the EU. Native-born exclude second generation migrants for the purpose of this breakdown. As information on second-generation migrants from the microdata of LFS 2023 was not available at the time of writing, data from the LFS 2021 was used in line with the analysis conducted below on the LFS 2021 ad-hoc module.

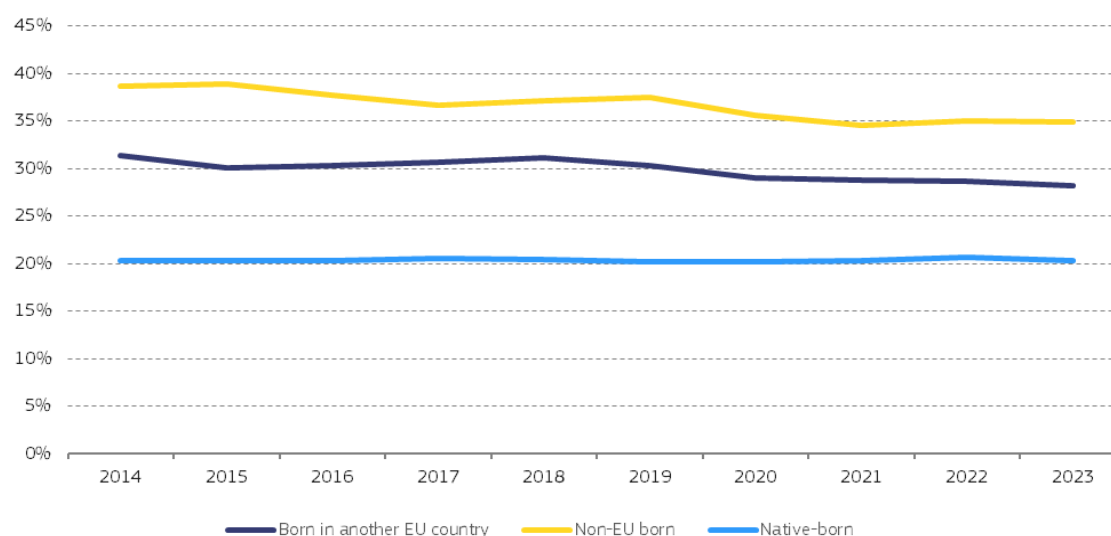
**The gap in overqualification between migrants and native-born has narrowed only slightly over time.** Tertiary-educated migrants have less favourable employment situations than native-born throughout the period from 2014 to 2023 (Chart 8). The share of migrants with tertiary-education employed in an occupation requiring a lower education level declined from 38.7% in 2014 to 34.9% in 2023 compared to stable overqualification rates among the native born,<sup>44</sup> but large and persistent differences remain.

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<sup>44</sup>Notwithstanding the break in time series in 2021.

## Chart 8: Overqualification rates over time

Overqualification rate of employed persons aged 20–64 years by country of birth, EU, 2014–2023



Source: Eurostat [lfsa\_eoqgan]

Note: 2021 break in series.

**In light of the large and persistent overqualification gaps, this chapter explores the factors associated with overqualification among migrants.**<sup>45</sup> The analysis exploits the 2021 Labour Force Survey (LFS) ad-hoc module on the labour market situation of migrants and their immediate descendants which allows to consider a rich set of factors that may affect overqualification typically not available in annual LFS data collections.<sup>46</sup> Multivariate analysis allows to assess the degree to which different characteristics of migrants are associated with a higher degree of overqualification. The below analysis uses a probit regression model to identify patterns of overqualification among different groups of migrants.<sup>47</sup> Full regression tables can be found in the Annex.

### **Arriving at a young age in the host country and having an EU citizenship reduce the probability of overqualification, but significant gaps remain between the native- and the foreign-born population.**

Research suggests that migrants who hold the citizenship of the host country have better labour market outcomes even after controlling for observable factors.<sup>48</sup> In fact, naturalisation in host countries grants migrants access to certain legal rights and entitlements, including intra-EU mobility. In line with existing literature, the analysis finds that holding the citizenship of an EU Member State reduces the likelihood of being overqualified by almost 5 pp.<sup>49</sup> Given that some academic training is done in the host country, those who arrive under the age of 15, who are also more likely to be naturalised, have a 4pp. lower probability to be overqualified.<sup>50</sup> Nevertheless, large gaps between migrants and the native-born population remain even when

<sup>45</sup> Note that EU mobile workers are outside of the scope of this analysis. The focus will be exclusively on third country migrants as there are different dynamics affecting third-country migrants compared to EU mobile workers.

<sup>46</sup> The LFS ad-hoc module (2021) includes a rich dataset of additional information on language skills and educational background of migrants, as well as self-perceived obstacles encountered at work or at finding a job. Despite these advantages, the LFS contains only a relatively small sample of migrants per country. People living in communal establishments are not sampled, affecting a significant share of the migrant population, posing some limitations to the analysis.

<sup>47</sup> Probit regressions are run on the full sample of migrants and native-born aged 20-64 who answered the LFS ad-hoc module 2021. As there may not only be different overqualification but also differences between migrants and native-born in terms of who is employed, Heckman selection models are run as a robustness check to account for this possibility. However, due to the lack of a fully exogenous instrument, baseline results reported are based on the probit regressions. Results are robust to different specifications unless otherwise specified. See tables A.1 and A.2 for full regression specifications.

<sup>48</sup> OECD (2011).

<sup>49</sup> This analysis uses citizenship of any EU Member State rather than citizenship of the host country as the relevant factor affecting overqualification, as the right to work in any Member State is a right enjoyed under any EU citizenship. In addition, some countries allow descendants of nationals to apply for citizenship in certain cases without having resided in the country. Results remain similar when considering host country citizenship.

<sup>50</sup> OECD (2011). Age cut-off based on OECD (2023).

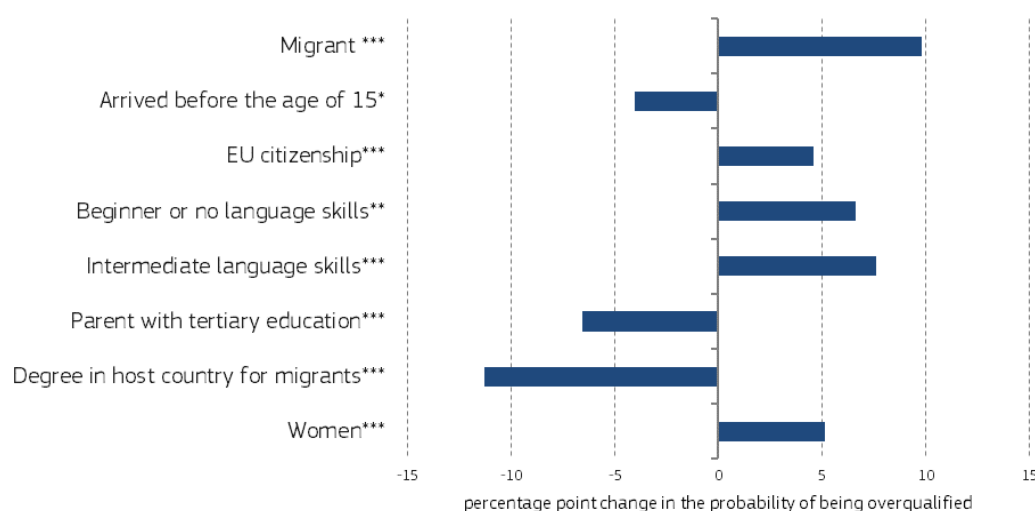
taking into account citizenship (Chart A.2). The analysis below aims to identify additional factors that are associated with a higher degree of overqualification.

**Migrants with poorer language skills and women have a higher probability of being overqualified.**

Over half of tertiary-educated migrants in employment report having arrived with hardly any or basic language skills in their host country (52.9%). At the time of the interview for the LFS ad-hoc module, the share of those having little language skills had dropped to 11.7%. For those employed, the regression analysis indicates that having lower language skills increases the probability of being overqualified by approximately 7 percentage points. (Chart 9) Women have a 5 pp. higher probability to be overqualified, but the results suggest no particular patterns among migrant women in particular compared to native-born women, even when controlling for the presence of children.

**Chart 9: Migrants are more likely to be overqualified than native-born, with variations by characteristics**

Factors connected to the probability of being overqualified, EU, 2021



Source: Author's calculations, LFS 2021.

Note: Average marginal effects using probit regression on sample of migrants and native-born (20-64) who answered the LFS ad hoc module 2021. Excludes Bulgaria, Croatia, Hungary, Malta, Poland, Romania, Slovakia and Slovenia due to sample size limitations and data reliability concerns. Chart shows a selection of key variables of interest where the deviation from zero shows the difference with respect to the reference group in parenthesis: migrant (people born in the country of residence), arrived before the age of 15 (arrived after the age of 15), EU citizenship (does not hold EU citizenship), beginner or intermediate language skills (mother tongue/advanced (proficient) user), parent with tertiary education (no parent has a tertiary education degree), degree in host country (highest level of education achieved outside country of residence), women (men). Results show the percentage point change in the probability of being overqualified when being in the category displayed rather than being in the reference group (in parenthesis). \*\*\* significant at 0.1%, \*\* significant at 1%, \* significant at 5%, no \* = not significant. For full set of results, see table A.1.

**Completing the highest level of education in the host country significantly reduces the risk of overqualification, pointing to issues with degree recognition for finding suitable employment.**

Holding a degree from the host country reduces the probability of being overqualified by 11.25 pp among migrants. (Chart 9) Interestingly, native-born who obtained their highest degree abroad have lower overqualification rates than native-born who graduated in the country they were born. This is in line with existing studies finding that a host-country degree reduces the migrant overqualification gap.<sup>51</sup> These findings point to the recognition of degrees obtained abroad as one of the barriers to migrants finding a suitable job.

**Tertiary-educated migrants most often report a lack of recognition of formal qualifications and a lack of language skills as key barriers to finding a suitable job.** Among those who are overqualified, 15.6% report a lack of recognition of formal qualifications abroad as the main obstacle to getting a suitable

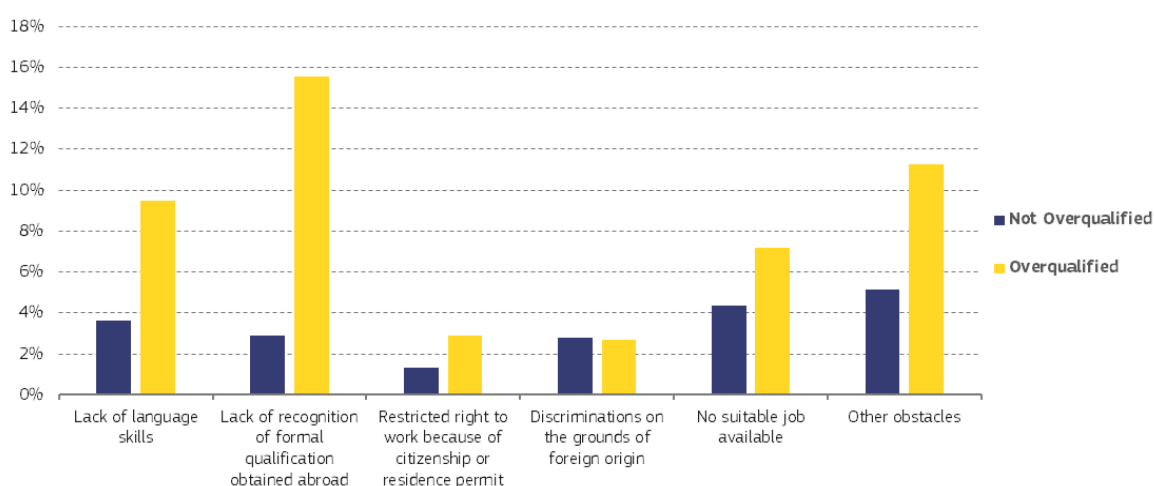
<sup>51</sup> OECD (2023).



job,<sup>52</sup> supporting the regression results. A further 9.5% mention a lack of language skills as the main impediment to a suitable job, while others refer to a lack of available suitable jobs overall (7.2%). Only 2.7% identify discrimination based on foreign origin as the main obstacle (Chart 10).<sup>53</sup> Looking further into the recognition of formal qualifications obtained abroad, over 40% (41.9%) of those overqualified report no issues with the recognition of their degrees, having either successfully applied for recognition of their education (17.6%) or not needing recognition (24.3%), In contrast, 14.2% have applied either with the outcome pending (3.8%) or with no success (10.4%) and another 18.0% report cost and complexity concerns as a reason for not applying (Chart A.3). These obstacles are notably more prevalent among those overqualified compared to those not overqualified, where three quarters (75.8%) have either had their degree recognised or did not need a recognition.<sup>54</sup>

### Chart 10: Main obstacle to finding a suitable job

Obstacles to finding a suitable job by overqualification status among migrants, EU, 2021



Source: Author's calculations, LFS 2021.

Note: Sample of all tertiary-educated migrants who are currently employed.

**Persons with lower-educated parents face an increased likelihood of being overqualified, both among native-born and migrants.** Persons where at least one parent obtained a tertiary degree have a lower likelihood of working in a job which does not fit their education level. For those where a parent obtained a tertiary degree, the probability of being overqualified for their job decreases by 6.5 pp. Higher parental educational background can affect children in several ways. Existing research suggests that parents of high economic status may better equip their children with skills, social networks or also higher aspirations, among others.<sup>55</sup> However, there is no differential effect for migrants, implying a rather universal effect of parental education on overqualification irrespective of the country of birth.

**Persons migrating to seek international protection tend to be more overqualified than those migrating for other reasons, including employment.** Persons who seek international protection have a 5.6pp higher probability of working in occupations not fitting their education level than those migrating for family reasons. Those with the lowest probability of being overqualified are on average persons who had already found a job before migrating (-12.2 pp.) or those migrating for education or training reasons (-7.4 pp.) (Chart 11). This points to international recruitment being effective in attracting talent from third countries with the required skills level, thus providing a better vertical skills match for those seeking employment from abroad. By region of origin, migrants from North America and Oceania have a lower likelihood of being overqualified

<sup>52</sup> The question asks respondents to identify obstacles to finding a suitable job, i.e. corresponding to the respondents' educational attainment. However, as this question is self-reported, suitability may be perceived differently by different respondents and not fully overlap with the concept of overqualification used in this analysis.

<sup>53</sup> While suitability should be assessed corresponding to the respondent's educational attainment, this is a subjective question and thus should be interpreted with caution. Around 50.9% of those identified as overqualified state that they have encountered no obstacles in getting a suitable job.

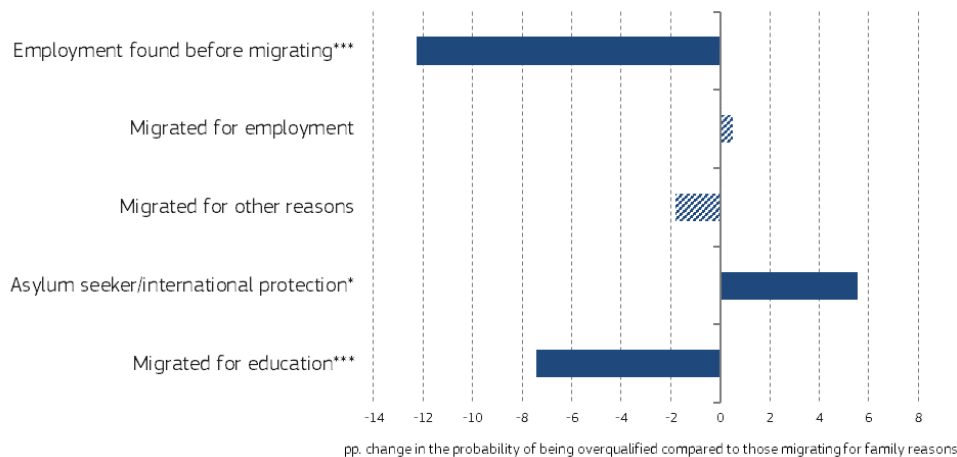
<sup>54</sup> Ahm2021\_estqual in LFS 2021 asks specifically about the recognition of formal qualifications obtained abroad, irrespective of whether this is mentioned as the main obstacle in the question on obstacles to finding a suitable job.

<sup>55</sup> Capsada-Munsech (2015).

when in employment, and those migrating from Africa excluding North Africa have a higher probability of being overqualified compared to other migrants.<sup>56</sup> (table A.1)

### Chart 11: Differences in the probability of overqualification by reason for migration

Probability of overqualification by reason for migration, EU, 2021



Source: Author's calculations, LFS 2021.

Note: Average marginal effects. Results show the percentage point change in the probability of being overqualified for persons migrating for different reasons compared to those migrating for family reasons using variable MIGREAS (self-reported).

\*\*\* significant at 0.1%, \*\* significant at 1%, \* significant at 5%, no \* = not significant (striped bars). For full set of results, see table A.1.

## 4. Conclusion

**Overqualification is more prevalent among persons born outside the EU than among the native-born population.** This is particularly the case for migrants without EU citizenship and those arriving at a later age. Overqualification is also more prevalent among women than men, among migrants and the native-born.

**Host country education significantly reduces the risk of overqualification, with recognition of qualifications remaining a key barrier to migrants' full integration into the EU labour market.** The results show a clear pattern of overqualification particularly among migrants who have issues with the recognition of their qualifications. Further, completing the highest degree in the host country reduces the probability of being overqualified by over 11 percentage points, the largest association out of the factors analysed. In 2023, the European Commission issued a Recommendation to simplify the recognition of qualifications of third-country nationals. It sets out guidance on simplifying and expediting the recognition of skills and qualifications of third-country nationals to facilitate their integration into the EU labour market, with the aim to significantly reduce the gap in the over-qualification rate between migrants and native-born by 2030.<sup>57</sup> The Commission's Skills Portability Initiative has also been announced in 2024 in the 2024-2029 political guidelines, which will further facilitate the cross-border recognition of skills across EU Member States.

**Proficiency in the host country language plays a significant role in finding a job matching migrants' skills.** Migrants who do not have fully proficient skills in the language of the host country are 7 percentage points more likely to be overqualified. Almost 1 out of 10 migrants who are overqualified identify a lack of language skills as the main obstacle to getting a suitable job, leading to underused skills of highly educated migrants, possibly exacerbating persistent labour shortages.

**Efforts to address overqualification need to consider multiple, intersecting barriers for different population groups.** The analysis shows that some population groups tend to be disproportionately overqualified among migrants and native-born, such as women or those with lower parental educational

<sup>56</sup> When controlling for observables, see full regression results in table A.1. Other differences by region in the main specification were not robust to different specifications.

<sup>57</sup> Commission Recommendation on the recognition of qualifications of third-country nationals, 15.11.2023.

attainment. Language skills and degree recognition are two of the key barriers identified by migrants to finding a suitable job. Nevertheless, 11.2% of those overqualified also referenced other obstacles as the key barrier to finding a well-matching job, showing that further efforts are needed to understand barriers to job matching and to address these with appropriate policies.

**Labour market outcomes of migrants receive considerable attention in EU policy, particularly in light of persistent labour shortages and projected demographic trends.** The Action Plan on Integration and Inclusion 2021-2027<sup>58</sup> acknowledges that overqualification of migrants means missed opportunities for the individuals concerned as well as society as a whole. The Action Plan puts forward various actions for the Commission and Member States to improve the recognition of qualifications, specifically, and improve the labour market integration of migrants generally. The European Commission's Pact on Migration and Asylum<sup>59</sup> recognises legal migration as an essential part of the EU's approach to migration and commits to explore an EU Talent Pool for skilled third-country workers, then developed under the 2022 Skills and Talent Package. This will be the first EU-wide platform aimed at facilitating international recruitment and providing opportunities for jobseekers from third countries that are interested and have the skills required to work in EU-wide shortage occupations.<sup>60</sup>

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<sup>58</sup> Commission Communication COM(2020) 758 final, 24.11.2020.

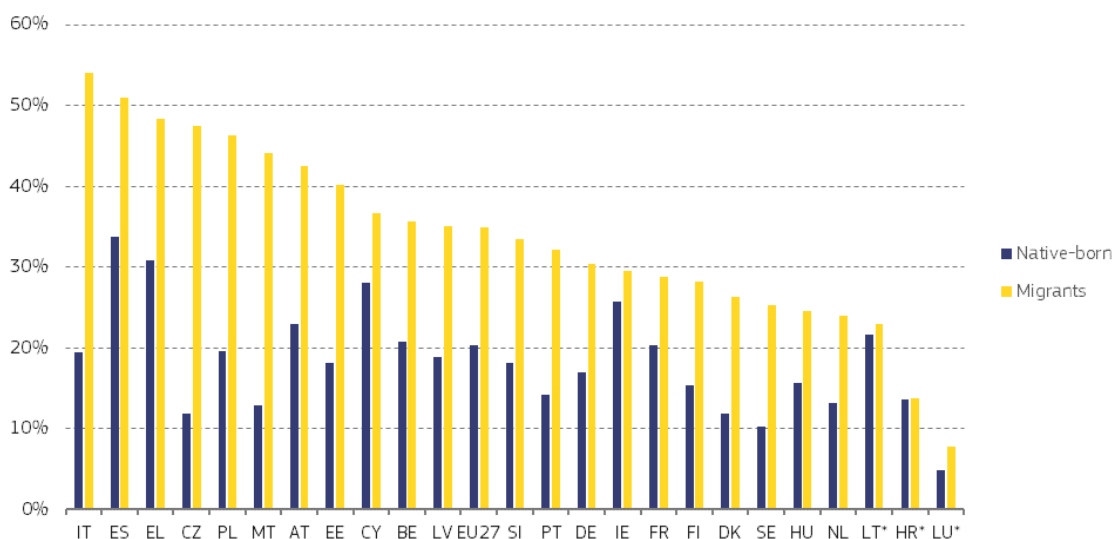
<sup>59</sup> COM/2020/609 final

<sup>60</sup> 2023/0404(COD)

## 5. Appendix

**Chart A.1: Overqualification rates across Member States**

Overqualification rate by Member State and country of birth, EU, 2023



Source: Eurostat [lfsa\_eoqgac]

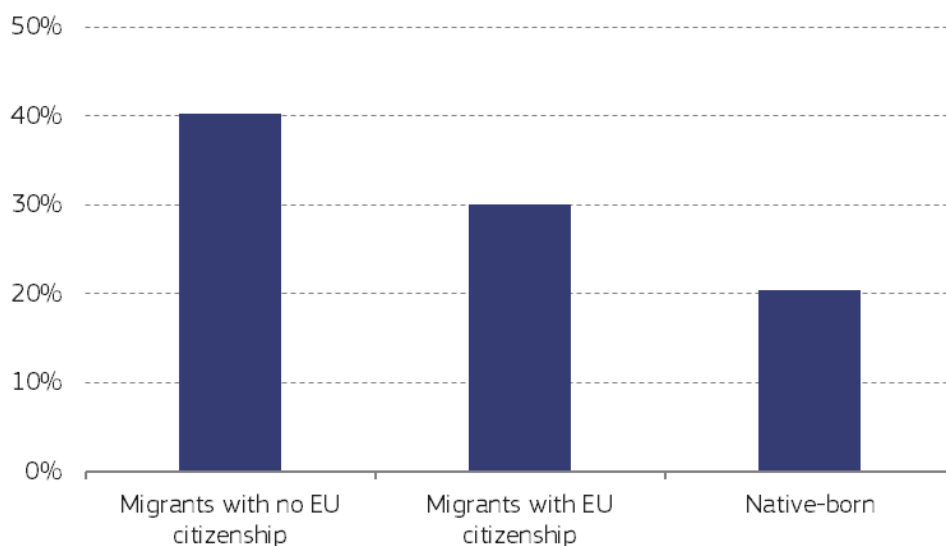
Note: Overqualification rate of employed persons aged 20-64. Only available data presented.

Spain and France: definition differs.

(\*) Migrants: Low reliability

**Chart A.2: Differences in the probability of overqualification by citizenship**

Rate of overqualification by citizenship and migration status, EU



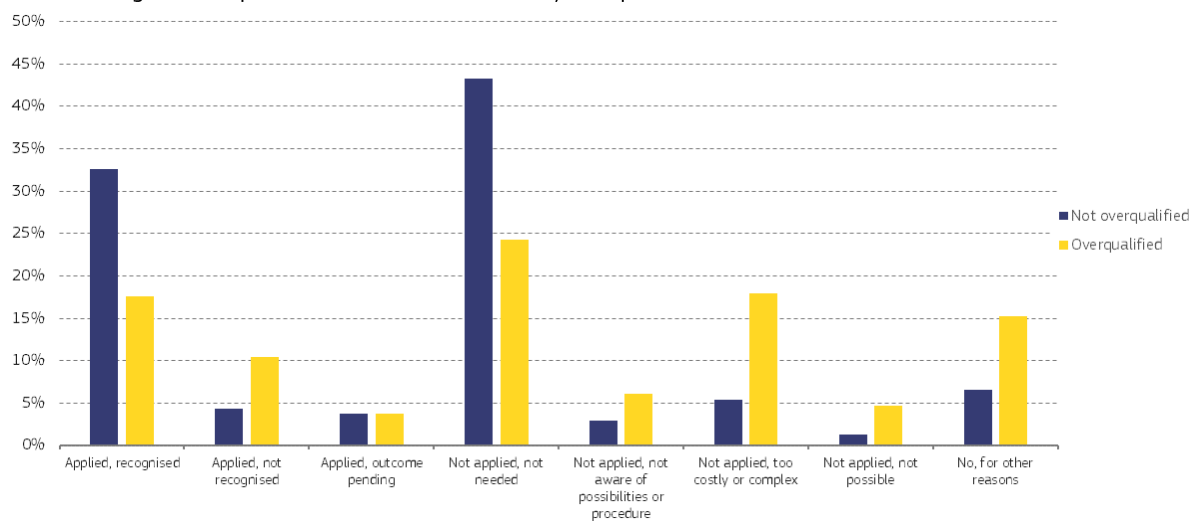
Source: Author's calculations, LFS 2021.

Note: EU citizenship includes holding a citizenship of any EU Member State regardless of the reporting country, see discussion in the main text on the use of EU vs host country citizenship.



### Chart A.3: Recognition of formal qualifications obtained abroad differs between those overqualified and those not

Status of recognition of qualifications obtained abroad by overqualification



Source: Author's calculations, LFS 2021.

Note: Share of respondents who answered question ahm2021\_estqual.

**Table A.1: Regression analysis – full results**

	(1)	(2)	(3)	(4)
Migrant	0.956*** (0.124)	0.918*** (0.123)	0.951*** (0.125)	0.925*** (0.121)
Migrated before age 15	-0.179** (0.0771)		-0.161** (0.0775)	-0.177** (0.0758)
Educated in host country	0.253*** (0.0590)	0.252*** (0.0590)	0.267*** (0.0583)	0.240*** (0.0562)
Educated in host country * migrant	-0.624*** (0.0865)	-0.679*** (0.0827)	-0.637*** (0.0857)	-0.611*** (0.0837)
Arrived 10+ years ago	0.103 (0.0853)	0.0730 (0.0844)	0.0763 (0.0861)	0.0848 (0.0836)
Arrived 5-9 years ago	0.0271 (0.0909)	0.0369 (0.0913)	0.0219 (0.0919)	0.0380 (0.0889)
Intermediate language skills	0.293*** (0.0681)	0.307*** (0.0680)	0.279*** (0.0684)	0.285*** (0.0668)
Basic or no language skills	0.257*** (0.0841)	0.264*** (0.0844)	0.265*** (0.0848)	0.251*** (0.0827)
>1 parent with tertiary degree	-0.270*** (0.0147)	-0.270*** (0.0147)	-0.262*** (0.0135)	-0.266*** (0.0134)
>1 parent with tertiary degree * migrant	-0.0889* (0.0511)	-0.0864* (0.0510)	-0.0875* (0.0510)	-0.0832* (0.0499)
Female	0.213*** (0.0142)	0.213*** (0.0142)	0.193*** (0.0134)	0.199*** (0.0127)
Female * migrant	0.0310 (0.0506)	0.0367 (0.0504)	0.0305 (0.0508)	0.0339 (0.0496)
Job found before migrating	-0.654*** (0.0821)	-0.627*** (0.0819)	-0.593*** (0.0833)	-0.615*** (0.0806)
Migrating for employment (without job)	0.0219 (0.0874)	0.0532 (0.0860)	0.0135 (0.0858)	0.00535 (0.0850)
Migrated for education/training	-0.352*** (0.0822)	-0.287*** (0.0754)	-0.324*** (0.0825)	-0.346*** (0.0812)
Asylum seeking/international protection	0.219** (0.0857)	0.229*** (0.0859)	0.214** (0.0875)	0.198** (0.0839)
Other reason for migration	-0.0771 (0.0972)	-0.0667 (0.0957)	-0.0681 (0.0954)	-0.0669 (0.0945)
Has partner	-0.149*** (0.0145)	-0.149*** (0.0145)	-0.141*** (0.0133)	-0.132*** (0.0144)
Partner * migrant	-0.0231 (0.0538)	-0.0170 (0.0536)	-0.0185 (0.0540)	-0.0738 (0.0570)
Age 35-49	-0.126*** (0.0169)	-0.126*** (0.0169)	-0.138*** (0.0153)	-0.128*** (0.0157)
Age 35-49*migrant	0.0964 (0.0649)	0.123* (0.0644)	0.108* (0.0648)	0.0776 (0.0647)
Age 50-64	-0.135***	-0.135***	-0.151***	-0.163***

	(0.0181)	(0.0181)	(0.0167)	(0.0165)
Age 50-64*migrant	0.000510	0.0389	0.0316	0.0439
	(0.0768)	(0.0753)	(0.0763)	(0.0749)
Holds EU citizenship	-0.205***	-0.221***	-0.181***	-0.188***
	(0.0600)	(0.0599)	(0.0597)	(0.0589)
Rural dummy	0.192***	0.191***	0.205***	0.205***
	(0.0163)	(0.0163)	(0.0151)	(0.0148)
Latin America	0.0385	0.0498	0.0420	0.0365
	(0.0713)	(0.0713)	(0.0718)	(0.0704)
MENA	0.130*	0.136**	0.145**	0.122*
	(0.0682)	(0.0682)	(0.0686)	(0.0670)
North America & Oceania	-0.322***	-0.327***	-0.389***	-0.343***
	(0.120)	(0.119)	(0.121)	(0.118)
Africa	0.226***	0.228***	0.223**	0.213**
	(0.0844)	(0.0843)	(0.0867)	(0.0837)
Asia	-0.104	-0.108	-0.0918	-0.115
	(0.0833)	(0.0829)	(0.0836)	(0.0817)
Has children				-0.0301**
				(0.0146)
Children * migrant				0.120**
				(0.0556)
Constant	0.535***	0.535***	0.508***	0.536***
	(0.0817)	(0.0817)	(0.0787)	(0.0747)
Country Fixed Effects	Yes	Yes	Yes	Yes
Control for NACE	Yes	Yes	Yes	Yes
Control for field of education	Yes	Yes	No	Yes
Observations	108,544	108,544	107,401	108,544

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Source: LFS (2021).

Note: Probit regression with robust standard errors. Outcome is 1 (overqualified) or 0 (not overqualified) for all persons in employment who are native-born or migrants. Results for predictive probabilities using margins available upon request.

Sample includes all native-born and migrants who are employed and hold a tertiary degree.

Excludes Bulgaria, Croatia, Hungary, Malta, Poland, Romania, Slovakia and Slovenia due to low sample size and/or data reliability concerns.

**Table A.2: Heckman selection analysis – second stage results**

	(1)	(2)	(3)
Migrant	0.747*** (0.117)	0.691*** (0.114)	0.692*** (0.114)
Migrated before age 15	-0.182** (0.0713)	-0.176** (0.0707)	-0.176** (0.0707)
Educated in host country	0.258*** (0.0530)	0.268*** (0.0533)	0.268*** (0.0532)
Educated in host country * migrant	-0.529*** (0.0799)	-0.514*** (0.0788)	-0.517*** (0.0787)
Arrived 10+ years ago	0.176** (0.0787)	0.192** (0.0778)	0.193** (0.0776)
Arrived 5-9 years ago	0.0947 (0.0832)	0.106 (0.0823)	0.105 (0.0822)
Intermediate language skills	0.158** (0.0642)	0.113* (0.0630)	0.118* (0.0629)
Basic or no language skills	0.0377 (0.0809)	0.00951 (0.0782)	0.0123 (0.0786)
>1 parent with tertiary degree	-0.257*** (0.0129)	-0.254*** (0.0127)	-0.254*** (0.0127)
>1 parent with tertiary degree * migrant	-0.0481 (0.0473)	-0.0387 (0.0468)	-0.0390 (0.0466)
Female	0.149*** (0.0130)	0.137*** (0.0121)	0.138*** (0.0121)
Female * migrant	-0.0338 (0.0475)	-0.0476 (0.0464)	-0.0406 (0.0463)
Job found before migrating	-0.327*** (0.0816)	-0.276*** (0.0764)	-0.278*** (0.0764)
Migrating for employment (without job)	0.166** (0.0814)	0.186** (0.0795)	0.183** (0.0793)
Migrated for education/training	-0.255*** (0.0771)	-0.221*** (0.0757)	-0.226*** (0.0756)
Asylum seeking/international protection	0.175** (0.0791)	0.165** (0.0782)	0.166** (0.0782)
Other reason for migration	-0.0301 (0.0890)	-0.0274 (0.0893)	-0.0259 (0.0890)
Has partner	-0.0706*** (0.0137)	-0.0629*** (0.0125)	-0.0610*** (0.0125)
Partner * migrant	-0.0586	-0.0481	-0.0474

	(0.0497)	(0.0494)	(0.0494)
Age 35-49	-0.0522*** (0.0156)	-0.0414*** (0.0144)	-0.0409*** (0.0144)
Age 35-49*migrant	0.0303 (0.0599)	0.0226 (0.0594)	0.0200 (0.0592)
Age 50-64	-0.157*** (0.0156)	-0.158*** (0.0154)	-0.155*** (0.0154)
Age 50-64*migrant	-0.0317 (0.0707)	-0.0472 (0.0701)	-0.0481 (0.0699)
Holds EU citizenship	-0.112** (0.0557)	-0.0877 (0.0547)	-0.0924* (0.0545)
Rural dummy	0.186*** (0.0143)	0.182*** (0.0141)	0.181*** (0.0141)
Latin America	0.00685 (0.0661)	-0.000782 (0.0653)	0.00383 (0.0652)
MENA	0.0226 (0.0641)	0.00184 (0.0626)	0.00408 (0.0625)
North America & Oceania	-0.325*** (0.110)	-0.326*** (0.109)	-0.325*** (0.110)
Africa	0.193** (0.0795)	0.179** (0.0790)	0.181** (0.0791)
Asia	-0.117 (0.0769)	-0.103 (0.0768)	-0.102 (0.0764)
Constant	0.258*** (0.0744)	0.202*** (0.0701)	0.197*** (0.0700)
Country Fixed Effects	Yes	Yes	Yes
Control for NACE	Yes	Yes	Yes
Instrument	Presence of children <5 and persons 65+ in household	Field of education	Both (1) and (2)
Observations	160,703	159,162	159,162

Source: LFS (2021).

Note: Heckman probit regression with robust standard errors, using different instruments to predict employment (1<sup>st</sup> stage). Results show second stage results only, additional tables available upon request.

Instruments are (1) presence of children under 5 and household members over 65, (2) field of education, or (3) both together. No instrument is expected to be fully exogenous as caring responsibilities may also affect the choice of job (due to e.g. the ease of adjusting work patterns to caring responsibilities) and the field of education may also make the probability of finding a job in the right field and with the right skills requirement more or less likely. Thus results are shown only for the purpose of robustness checks.

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