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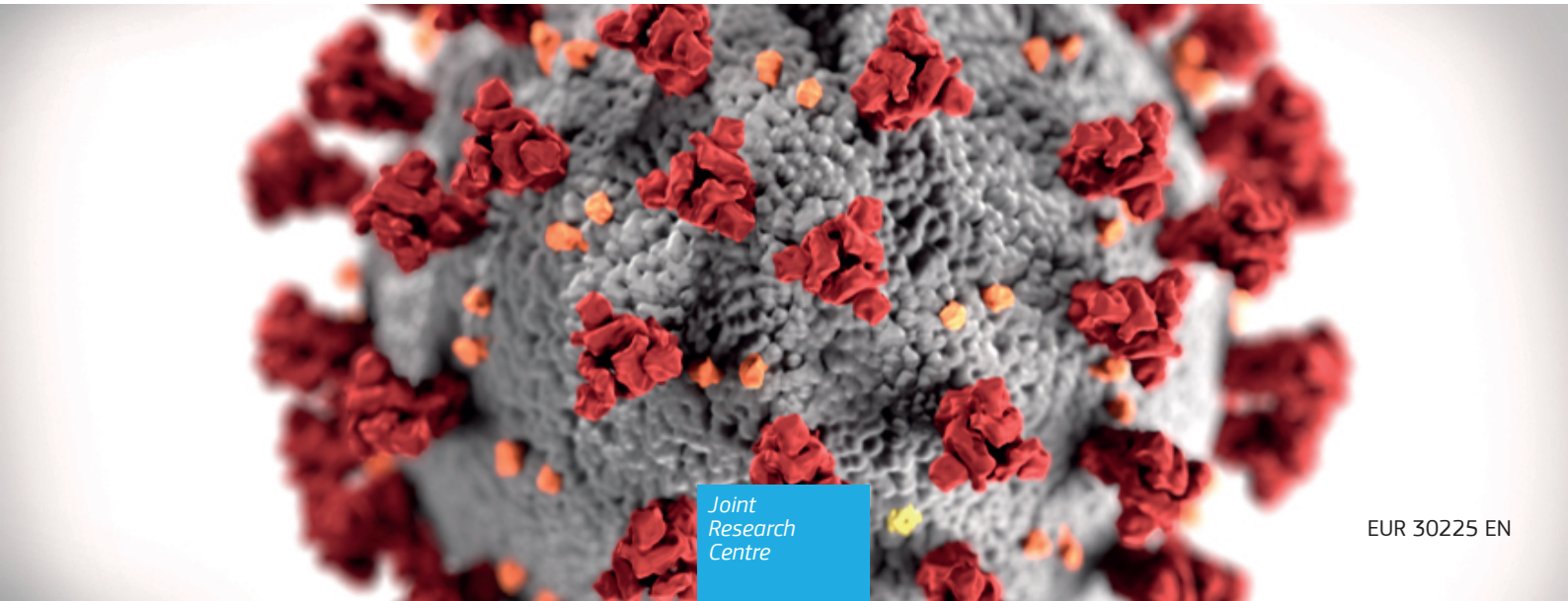

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A Vulnerable Workforce: Migrant Workers in the COVID-19 Pandemic

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Abstract

This report analyses the labour conditions of migrant workers in the EU in the context of the COVID-19 epidemic. By looking at the prevalence of temporary contracts, the position in the income distribution and the likelihood that jobs can be conducted from home for both key and other migrant workers, it highlights the potential and distinct vulnerabilities for these two groups. Foreign born workers - especially Extra-EU migrants - are at a disadvantage in all three dimensions: they are more likely to be in temporary employment, earn lower wages and have jobs that are less amenable to teleworking. The report concludes by identifying possible areas of policy intervention to address these vulnerabilities.

JEL Codes: F22, J61, K37
Keywords: Migrant workers, COVID-19 epidemic, key occupations.

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Key Messages

- Among key workers, EU mobile and Extra-EU workers are concentrated in low skilled professions.
- The highest shares of migrant workers is among the cleaners and helpers (38%), labourers in mining and construction (23%), stationary plant and machine operators (20%) and personal care workers (19%).
- EU mobile and Extra-EU key workers are 16% and 48% more likely to be employed under temporary contracts than natives, respectively.
- More than half of EU mobile and Extra-EU key workers fall in the bottom four deciles of the overall income distribution.
- The higher probability of temporary employment and lower wages for foreign key workers - especially Extra-EU ones - compared to natives, persists even when accounting for differences in occupation, education, age and gender composition between the groups.
- A high share of foreign born key workers are employed in occupation non amenable to telework.
- Other extra-EU workers are particularly vulnerable to forced shutdowns being frequently employed in non-teleworkable occupations, on temporary contracts and belonging to the bottom of the income distribution.

1 Introduction

"Key workers" are at the front line of Europe's COVID-19 response, performing the crucial tasks of keeping European citizens healthy, safe and fed during the pandemic. Understanding who these workers are and under which conditions they can effectively continue providing their essential services is a crucial element of any informed strategy to cope with the pandemic. Two recent studies have estimated that foreign born workers account for large fractions of this "essential workforce": 19% of key-workers in the US (Gelatt, 2020) and 13% in the EU (Fasani and Mazza, 2020) are migrants, while they make up approximately 17% and 13.3% of the employed workforce, respectively.[1] Since migrant workers typically experience an overall weaker status in host country labour markets, assessing to which extent this vulnerability affects migrant key-workers is the first step to devise policy interventions that may allow them to better cope with the ongoing crisis and keep contributing to its solution.

This report unfolds as follows. Section 2 discusses possible dimensions of vulnerability of migrants workers. Section 3 presents the data used and briefly describes our methodology. Section 4 discusses the presence of migrant workers in key occupations. Section 5 focuses on native-immigrant gaps for key-workers in the probability of having a fixed-term contract (section 5.1) and in the position in the earnings distribution (section 5.2). Section 6 assesses to which extent migrant occupations - for both key and other workers - can be performed from home. Section 7 concludes with a brief discussion of policy implications.

2 Migrant Key Workers and Vulnerability

Several factors may lead us to expect migrant workers to be more vulnerable to the COVID-19 pandemic than natives. Migrant workers typically experience a weaker socio-economic integration than natives. As relative new-entrants in the host country labour markets, they are generally more likely to have fixed-term contracts, to work under non-standard contract and informal arrangements and to have shorter job tenure. Their earnings are typically lower than that of comparable native workers, implying a lower ability to accumulate savings. Further, migrants' residence status typically determines their entitlement to welfare state provisions, limiting their access with respect to natives (Avato et al., 2010). This vulnerability may be exacerbated in the midst of a pandemic and of the associated economic contraction which is triggered by government-imposed lockdowns and by the fall in citizens' demand for goods and services. Migrants are more likely to lose their job during economic downturns (Dustmann et al., 2010): a higher likelihood of becoming unemployed associated with lower savings and with limited access to the safety net is a recipe for economic destitution and marginalization. For migrants on temporary visas, it may also jeopardize the chances of renewal of their residence documents, forcing foreign workers to either return home or stay as undocumented immigrants. In addition to these pre-existing factors that

[1] This share is for 2019 and still includes the U.K. Source: Eurostat.

tend to make migrants' economic situation particularly dire during recessions, there may be pandemic-specific risks that disproportionately affect them. Migrants may face a higher health hazard than natives if they are more exposed to the contagion: this may happen if they tend to live in more densely populated areas, to work in particularly crowded conditions and to be concentrated in occupations that envisage more direct contact with other individuals (e.g. care workers, elderly care) and, in particular, with individuals potentially infected (e.g. health workers). Further, any additional hurdle that migrant workers may face in accessing health care and receive medical attention becomes extremely salient here, increasing the chances that exposure to contagion leads to dramatic health consequences.

The peculiar nature of the economic recession caused by the pandemic - in particular, its differential impact on sectors of the economy depending on whether they are considered essential or not - likely implies heterogeneous effects on the vulnerability of migrants in key and in other occupations. If migrant key workers may face a low - or even reduced - probability of losing their job despite the ongoing economic downturn, their exposure to the pandemic may be very high, being placed at the front line of the COVID-19 response. The opposite is true for migrants who were not employed in key-sectors (or not employed at all) before the pandemic developed: while the stay-at-home orders will shield them from contagion, their economic situation is bound to rapidly deteriorate.

The extent to which non-essential jobs can be carried out with teleworking has suddenly become a crucial element to preserve employment levels. Although evidence based on social experiments (Bloom et al., 2015; Angelici and Profeta, 2017) suggests workers' productivity enhancements due to shift to working from home, teleworking arrangements are still relatively uncommon, being below 10% in most countries (Eurofound and the International Labour Office, 2017). Boeri et al. (2020) estimate that the share of jobs that could potentially be carried out from home varies between 20 and 30% in selected EU countries. Whether the shift to teleworking will help also migrant workers employed in non-essential sectors to keep their jobs will primarily depend on the type of occupations they were employed in before the pandemic spread. *Teleworkability* has substantial distributional consequences as higher skilled professions tend to be more amenable to telework than low skilled ones. Mongey et al. (2020) using February and March CPS data for the US find that professions ranking low in *teleworkability* and high in their physical-proximity measure experienced larger employment declines relative to pre-epidemic February-March changes. Furthermore, these job losses are affecting the most vulnerable disproportionately. Key workers do not risk mass layoffs since their function is essential during the epidemic, nonetheless, whether they can work from home or not has implications for them as well. Social distancing measures are intended to protect the population from infection by minimizing the occasions of personal interaction. Given their particular role key workers are exempt from these measures and are asked to carry out their functions regardless of whether they can be performed from home or not. But this exposes those key workers whose profession is not *teleworkable* (i.e. doctor, nurses, refuse workers) to a higher chance of contagion than the rest of the population.[2]

[2]For example, stories have emerged of widespread contagions occurring in meat process-

3 Data and Methodology

We use the most recent wave (2018) of the EU Labour Force Survey (EU-LFS) for our analysis. We restrict the sample to employed workers aged 15-64 and distinguish two groups of migrant workers based on their country of birth: EU mobile citizens (i.e. workers born in a EU Member State other than the one where they currently work and reside) and Extra-EU migrants (i.e. workers born outside of the Union). Further, we define as native anyone who was born in the current country of residence. Our sample includes 1,737,682 individuals, of which 1,548,223 are natives, 70,431 EU-mobile and the remaining 119,028 Extra-EU workers.

Our definition of key workers is based on the Communication from the Commission on Guidelines concerning the exercise of the free movement of workers during COVID-19 outbreak[3] supplemented with the Dutch definition of key workers.[4] We identify key workers based on ISCO-08 occupations at three digits, which is the most detailed classification available in the EU-LFS.[5] Note that both the Commission's and the National's definitions often refer to a finer ESCO four digits classification.[6] Our definition is thus necessarily more generous than the original one, but there are no obvious reasons to expect this discrepancy to affect the comparisons between natives, EU migrants and Extra-EU migrants that we discuss below.

In our empirical analysis, we explore different dimensions of the vulnerability of migrants in key occupations: temporary contracts (section 5.1), position in the income distribution (section 5.2) and possibility of teleworking (section 6). We discuss evidence on overall differences in outcomes between natives and migrant key-workers as well as on estimation results from regression analysis. In our regressions, we compare natives and immigrants with similar observable characteristics (age, sex, education, occupation) and estimate conditional differentials in the outcomes of interest.

4 Migrant Workers and Key Occupations in the EU

Figure 1 compares the concentration of natives and migrant workers in different key occupations. We distinguish occupations in high and low qualifications ones based on the median

ing plants, a key industry, in the US. Source: https://www.nbcnews.com/news/us-news/nearly-900-workers-tyson-foods-plant-indiana-test-positive-coronavirus-n1197776

[3] https://ec.europa.eu/social/main.jsp?langId=en&catId=89&furtherNews=yes&newsId=9630

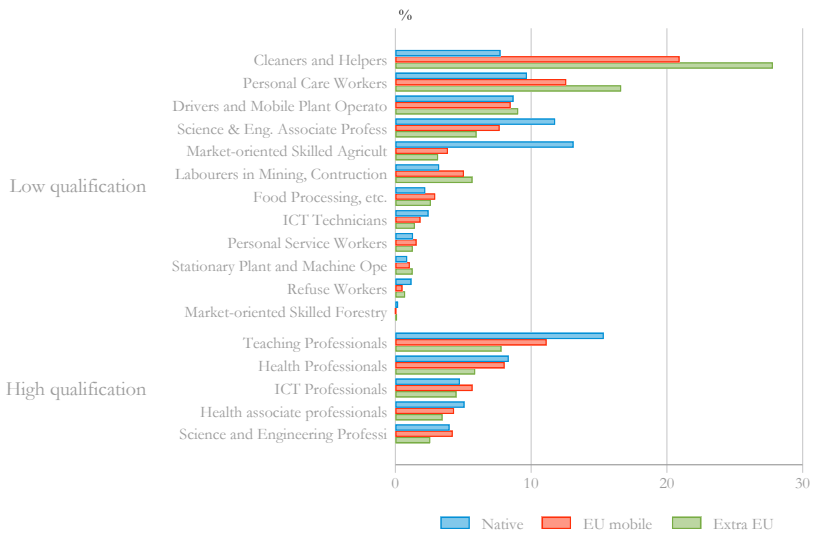
[4] https://www.government.nl/topics/coronavirus-covid-19

[5] A full list of our definition of key profession is provided in the appendix Table 3.

[6] ESCO is the European implementation of ISCO and therefore the two classifications can be easily mapped into each other.

level of education of the workers employed in each ISCO 2-digits occupation.[7] Teaching, health and health associate, ICT, science and engineering professionals belongs to the first category while all other occupations fall in the second one. Among high qualified occupations, Figure 1 shows that migrants are particularly concentrated in the low qualification professions. The three most frequent key occupations for Extra-EU migrants (cleaners and helpers, personal care workers and drivers and mobile plants operators) belong to this group, as two out of the three most frequent occupations for EU mobile key workers do. The most frequent occupation for natives, instead - teaching professionals - is a high qualification one.

Figure 1: Share of Key Workers, by Key Occupation

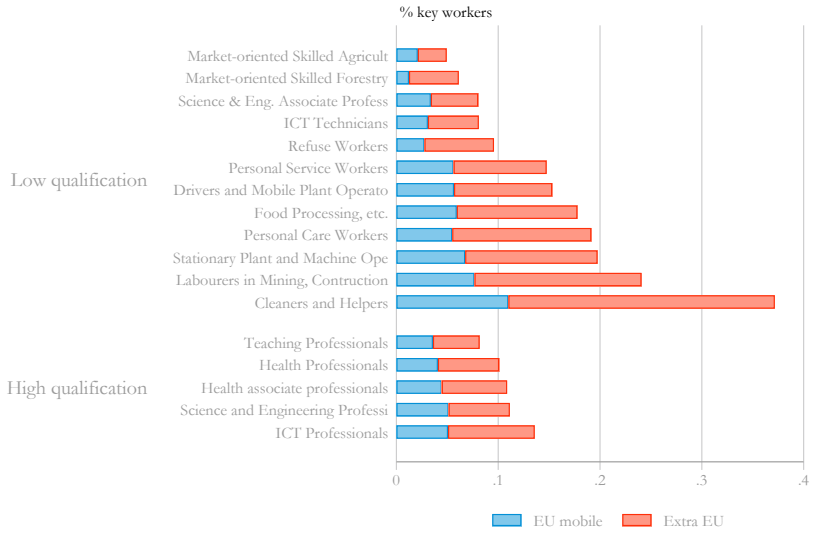


Note: Occupations are defined following ISCO 2 digits classification.

In Figure 2, we report the share of migrant workers - EU mobile (blue bars) and Extra-EU (red bars) - in each key occupation for the entire EU area separating low and high qualification professions. While foreign born workers account for 13% of key workers in the EU (Fasani and Mazza, 2020), in many key occupations we observe shares which are substantially larger. In particular, We observe the highest shares of migrants in low qualified occupations such as cleaners and helpers (38%), labourers in mining and construction (23%), stationary plant and machine operators (20%) and personal care workers (19%). In high skilled occupations, instead, we have share varying between 8% among teaching professionals and 14% among ICT professionals.

[7]We defined high skilled occupations all those occupations whose workforce median educational level is above ISCED level 3, while low skilled occupations are those whose workforce median level of education is equal or below that.

Figure 2: Share of Migrant Key-Workers, by Key Occupation



Note: Occupations are defined following ISCO 2 digits classification.

5 Migrant-Native Gaps for Key-Workers

5.1 Temporary contracts

The share of workers aged 15-64 who are employed with temporary contracts in the EU is approximately 11%. As Figure 3 shows, this share varies widely across Member States, being close to zero in Eastern Countries such as Estonia, Lithuania, Latvia and Romania while being above 20% in Spain (red dots in the graphs). These percentages are similar among key workers (blue bars), with the EU average being equal to 11%.

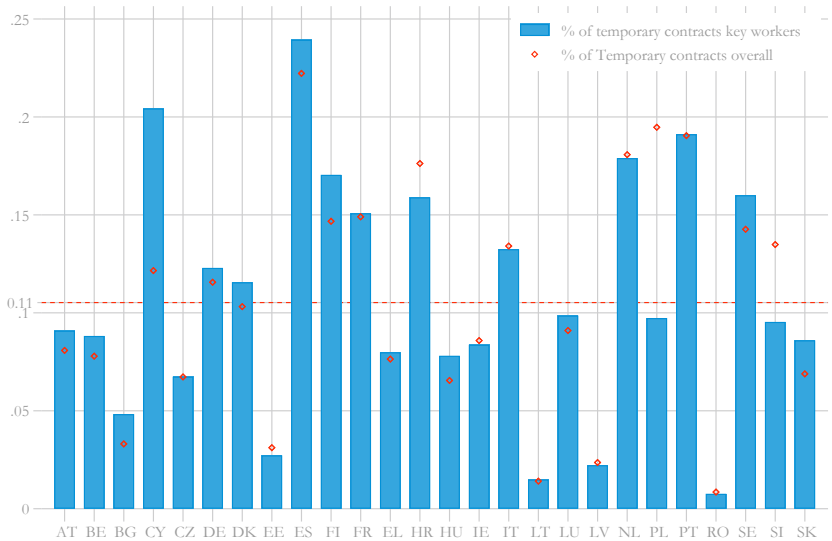
In Figure 4 we report the percentage point difference between migrants and natives in the share of key workers with temporary contracts in each Member State. Both groups of migrants are more likely to have a temporary job than natives, although to different extents. On average, the difference is equal to 1.8 p.p for EU Mobile and to 5.3 p.p. for Extra-EU workers (see dashed lines in the figure) which correspond to a 16% and 48% higher probability of being a temporary employee with respect to the average value (11%), respectively. The migrant-native differentials for EU-mobile workers (red bars) are mostly positive (with the exception of Slovakia, Ireland, Austria, Hungary and Slovenia) but relatively small in magnitude. We observe large differentials only in Italy (10 p.p.), Greece (8 p.p.), Denmark (7 p.p.) and Hungary (6 p.p.). The differentials are far larger for Extra-EU workers (blue bars): they are above 10 p.p. in four countries - Poland (21 p.p.), Cyprus (18 p.p.), Italy (13 p.p.) and Spain (11 p.p.) - and vary between 8 and 10 p.p. in other six countries (France,

Table 1: Probability of temporary contracts

	EU Mobiles		Extra EU	
	(1)	(2)	(3)	(4)
Origin:				
EU mobile	-0.019**	(0.007)		
Extra EU			-0.026***	(0.007)
Origin × Country:				
BE	0.009	(0.017)	0.092***	(0.018)
BG	0.001	(0.010)	-0.051	(0.037)
CY	0.044*	(0.021)	0.584***	(0.017)
CZ	0.058	(0.037)	0.037	(0.046)
DE	0.042***	(0.009)	0.076***	(0.008)
DK	0.064***	(0.017)	0.074***	(0.012)
EE	0.012	(0.032)	0.080***	(0.013)
ES	0.022	(0.029)	0.074***	(0.020)
FI	0.028	(0.037)	0.103*	(0.041)
FR	0.078**	(0.030)	0.096***	(0.017)
EL	0.161***	(0.030)	0.091***	(0.014)
HR	0.078	(0.064)	0.016	(0.027)
HU	0.019	(0.014)	0.017	(0.026)
IE	0.004	(0.010)	0.058***	(0.012)
IT	0.001	(0.010)	-0.012	(0.008)
LT	0.108**	(0.041)	0.083***	(0.010)
LU	0.049**	(0.019)	0.232***	(0.043)
LV	0.049*	(0.019)	0.065***	(0.017)
NL	0.094**	(0.032)	0.132***	(0.019)
PL	-0.168***	(0.015)	0.227**	(0.074)
PT	0.086***	(0.023)	0.061***	(0.014)
RO	0.010	(0.018)	0.004	(0.018)
SE	0.087***	(0.011)	0.170***	(0.009)
SI	-0.013	(0.030)	0.001	(0.027)
SK	0.102	(0.057)	0.015	(0.035)
Country FE	✓		✓	
Occupation FE	✓		✓	
Age FE	✓		✓	
R^2	0.160			
Obs.	416,477			

Note: ***, ** and * denote statistical significance at the 99.9, 99 and 95%, respectively. All regressions include a gender dummy. All regressions are weighted using person weights from the LFS. Robust standard errors in parentheses.

Figure 3: Share of Temporary Contracts, by Country



Note: The bars report the share of temporary contracts among key workers in the country. The diamonds represent the share of temporary contracts overall in the country. The dashed line indicates the EU average of temporary contracts (11%).

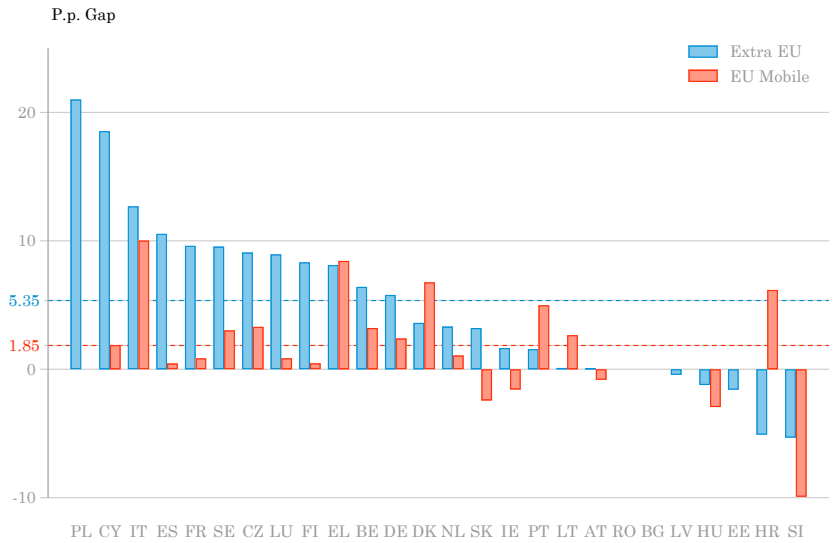
Sweden, Czech Republic, Luxembourg, Finland and Greece).

The native-migrant gap in the probability of being in temporary employment may increase or decrease once we take into account the differences in individual characteristics between natives and immigrants. If being a young worker is strongly associated with having a temporary contract, for instance, migrants may appear over-represented among temporary workers because they are typically younger than the native population (see Appendix Figure 15). Our regression analysis allows to compare the probability of being on a temporary contract for migrants and natives while holding constant their observable characteristics. We report our estimates for the conditional migrant-native gap by member states for EU mobile and Extra-EU workers in panel (a) and (b) of Figure 5. For both group of migrants the vast majority of positively signed bars suggest that migrants tend to be more likely than natives to have temporary contract even once you compare workers with similar characteristics and employed in similar occupations.[8] The estimated gap for EU mobile workers (Figure 5, panel a) is relatively small and not statistically different from zero in approximately half of the EU countries, while it gets larger in size and becomes strongly significant in most countries for Extra-EU workers.

In Figure 6 we report estimated coefficients from a similar exercise, but we now estimate

[8]In our regressions, we condition on occupation dummies, gender, educational level, age, age squared, country of residence and migration status.

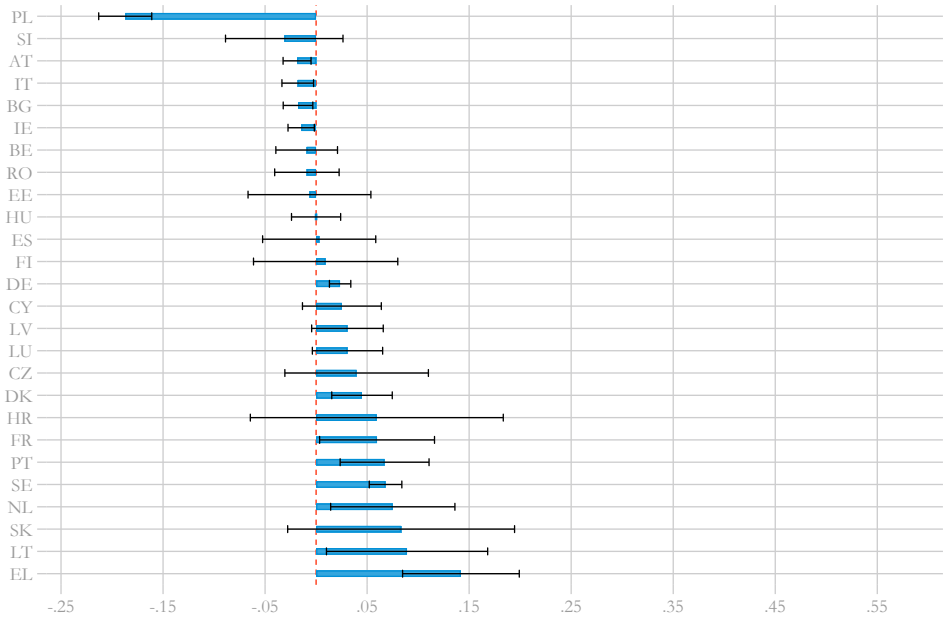
Figure 4: Probability of Having a Temporary Contract: Migrant vs. Native Key-Workers, by Member State



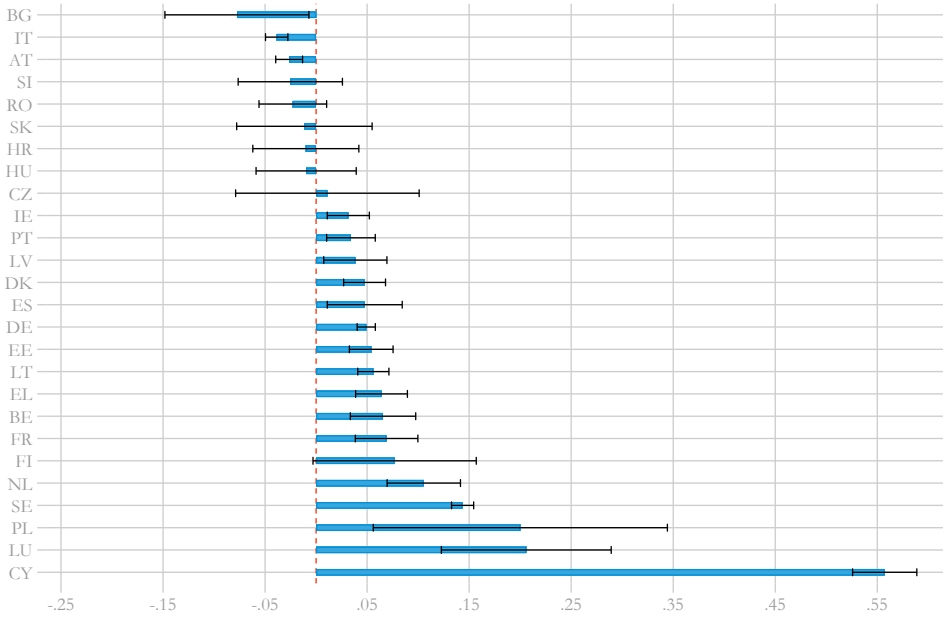
Note: The bars report the percentage point difference for the probability of having a temporary contract between native and migrant key workers. The red dotted line indicates the EU average for the EU mobile vs. native difference (1.55 percentage points), while the blue dotted line indicates the EU average for the Extra-EU vs. native difference (5.35 percentage points).

gaps by key occupation rather than by Member State. We distinguish high and low skilled occupations (blue and red bars, respectively). Even within occupation, migrant workers are more likely to have a temporary contract than natives, although the gaps for Extra-EU workers (panel b) are larger (and more often statistically different from zero) than for EU mobile. Remarkably, we observe significant gaps for EU migrants almost exclusively in high skill occupations, while for Extra-EU workers we find significant gaps in both low and high skill jobs.

Figure 5: Native-Migrant Gap in Temporary Contract Probability, by Member State



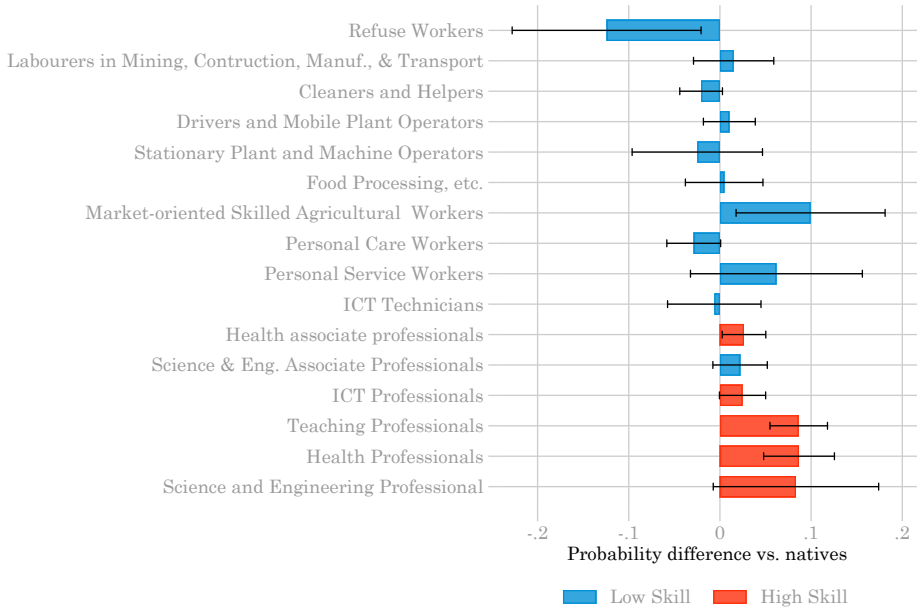
(a) EU Mobile



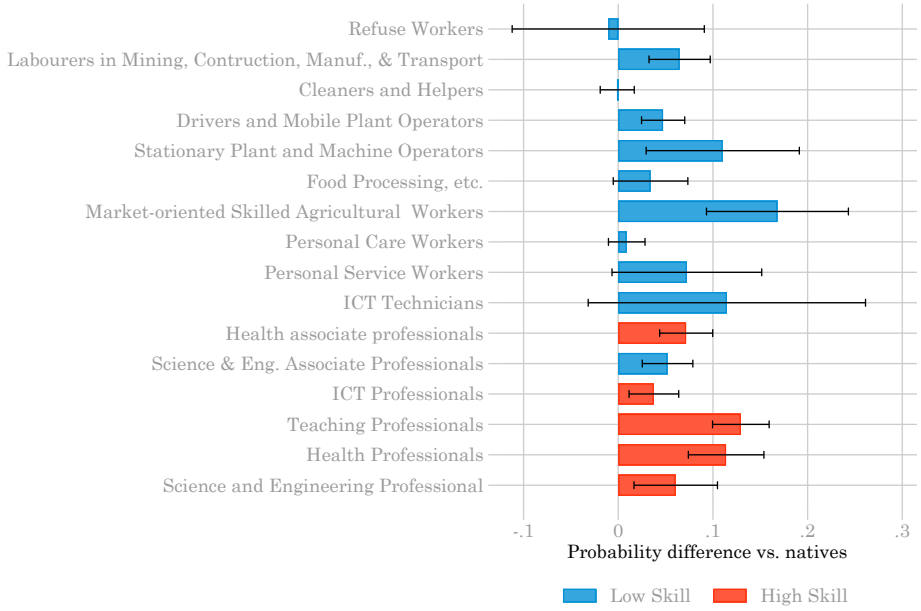
(b) Extra-EU

Note: Coefficients estimated with OLS regression in a model controlling for occupation, gender, educational level, age, age squared, country of residence and migration status. The thick blue bars represent the coefficient for the interaction between a migration status dummy and host country dummies. The thin black bars represent the 95% confidence intervals.

Figure 6: Native-Migrant Gap in Temporary Contract Probability, by Occupation



(a) EU Mobile



(b) Extra- EU

Note: Coefficients estimated with OLS regression in a model controlling for occupation, gender, educational level, age, country of residence and migration status. The thick blue bars represent the difference in the probability of being employed with a temporary contract between natives and migrants. The thin black bars represent the 95% confidence intervals.

5.2 Labour Income

In Figure 7, we report the labour income distribution for key workers (filled bars) and all workers (transparent bars) for natives, EU mobile and Extra-EU (panels a, b and c, respectively). The comparison between colored and empty bars for natives (panel a) shows that the income distribution for key workers is more polarized than the overall distribution, with relatively higher shares of key-workers falling in the bottom decile and the top three deciles of the distribution. Foreign born workers displays a rather distinct pattern: their income distribution is skewed to the left, with approximately 48% of EU mobile (panel b) and 53% of Extra-EU workers (panel c) in the bottom four deciles. The distribution of migrant key workers is even more skewed to the left: approximately 54% of EU mobile and 59% of Extra-EU key-workers fall in the bottom four deciles. If we just focus on the bottom decile, the share of EU-mobile migrants increases from 11% to 16% when we move from overall workers to the subset of key workers, whereas it grows from 16% to 22% for Extra-EU workers.

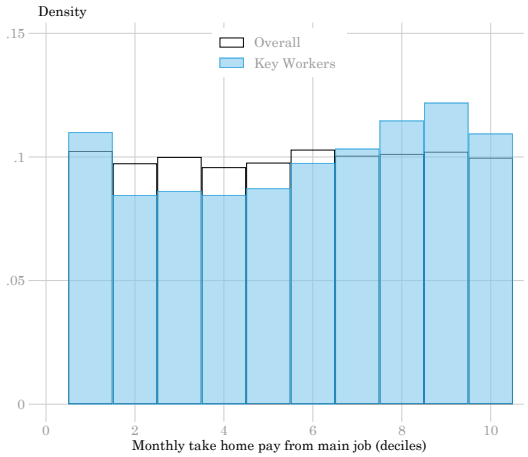
Figures 8 and 9 show that income gaps between native and migrant key-workers persist even when controlling for individual characteristics and comparing individuals employed in the same occupations. Indeed, Figure 8 reports regression coefficients for the native-migrant gap in probability of being above the median of the income distribution. With the exception of the positive coefficients estimated in Bulgaria and Spain, significant gaps for EU-mobile workers are all negative (panel a), being particularly large in countries such as Italy (-25 p.p), Greece (-21 p.p), Luxembourg (-21 p.p.) Lithuania (-19 p.p.) and Cyprus (-17 p.p.). The probability of belonging to the upper half of the income distribution with respect to natives is even lower for Extra-EU workers (panel b): we observe negative and large gaps in most EU countries, exceeding 20 p.p. in Cyprus, Greece, Italy, Luxembourg and Latvia. In contrast with this general pattern, however, we estimates small - but statistically significant - gaps for Extra-EU workers in Austria, Spain, Finland and Sweden. The analysis by occupation in Figure 9 generally confirms that both migrant groups tend to have a lower probability of having earning above the median with respect to comparable natives who are employed in the same key-occupations. Nevertheless, we estimate positive and significant coefficients for EU mobile workers in two high skill occupations (health professionals and service and engineering professionals) while only science and engineering professionals earn more than their native counterparts in the case of Extra-EU workers.

Table 2: Probability wage higher than median

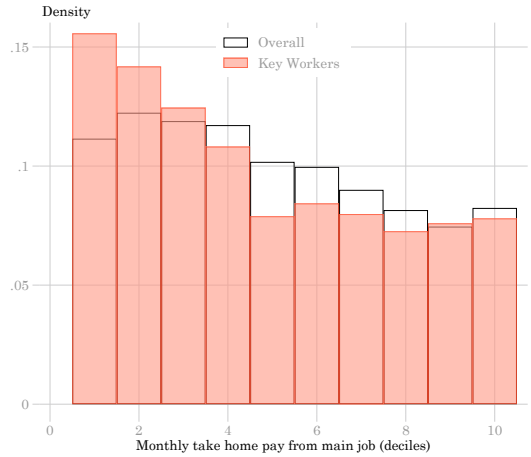
	EU Mobiles		Extra EU	
	(1)	(2)	(3)	(4)
Origin:				
EU mobile	-0.012**	(0.004)		
Extra EU			0.030***	(0.004)
Origin × Country:				
BE	-0.098***	(0.023)	-0.191***	(0.020)
BG	0.252***	(0.013)	-0.022	(0.149)
CY	-0.150***	(0.022)	-0.339***	(0.014)
CZ	-0.008	(0.017)	0.013	(0.023)
DE	-0.081***	(0.007)	-0.146***	(0.006)
DK	-0.068***	(0.019)	-0.085***	(0.014)
EE	0.110	(0.097)	-0.155***	(0.027)
ES	0.040***	(0.012)	0.049***	(0.007)
FI	-0.010	(0.015)	0.029	(0.016)
FR	-0.113***	(0.026)	-0.198***	(0.016)
EL	-0.202***	(0.026)	-0.339***	(0.015)
HR	0.088	(0.046)	-0.099***	(0.029)
HU	-0.009	(0.028)	-0.016	(0.046)
IE	-0.045***	(0.008)	-0.128***	(0.010)
IT	-0.260***	(0.009)	-0.385***	(0.007)
LT	-0.179**	(0.065)	-0.140***	(0.024)
LU	-0.201***	(0.027)	-0.295***	(0.044)
LV	0.110	(0.148)	-0.271***	(0.057)
NL	0.011	(0.029)	-0.083***	(0.018)
PL	-0.022	(0.058)	-0.084*	(0.033)
PT	0.034	(0.020)	-0.067***	(0.013)
RO	0.091	(0.067)	-0.277*	(0.130)
SE	-0.027***	(0.005)	0.003	(0.004)
SI	0.008	(0.017)	-0.046***	(0.014)
SK	-0.060	(0.061)	-0.016	(0.059)
Country FE	✓		✓	
Age FE	✓		✓	
R^2	0.296			
Obs.	505,340			

Note: ***, ** and * denote statistical significance at the 99.9, 99 and 95%, respectively. All regressions include a gender dummy. All regressions are weighted using person weights from the LFS. Robust standard errors in parentheses.

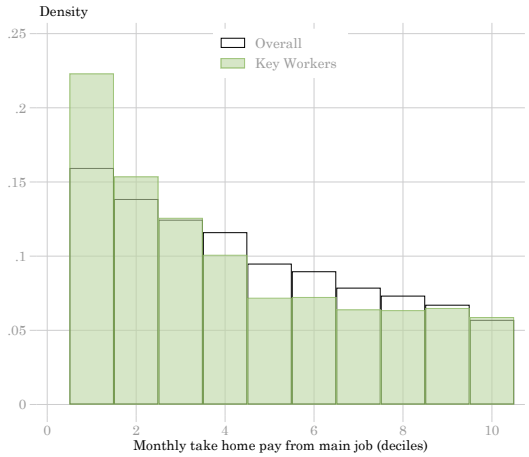
Figure 7: Labour Income Distribution Key Workers vs. All workers



(a) Natives



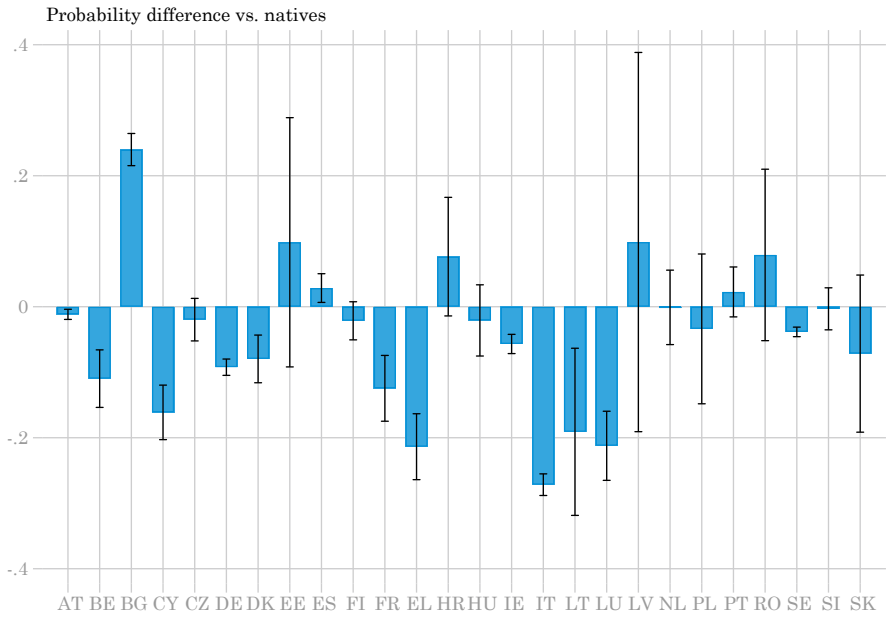
(b) EU Mobile



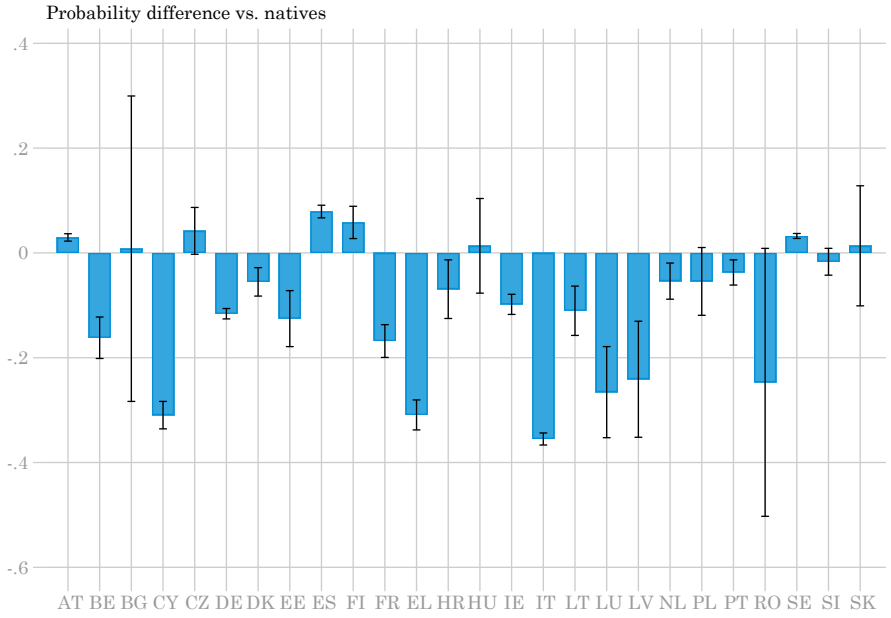
(c) Extra-EU

Note: The colored bars represent the deciles of monthly take home pay for Native (Panel 7a), EU mobile (Panel 7b) and Extra-EU (Panel 7c) key workers. The transparent bars represent the deciles of monthly take home pay for all workers by area of origin.

Figure 8: Native-Migrant Gap in Probability of Being in the Upper Half of Labour Earnings Distribution - by Country



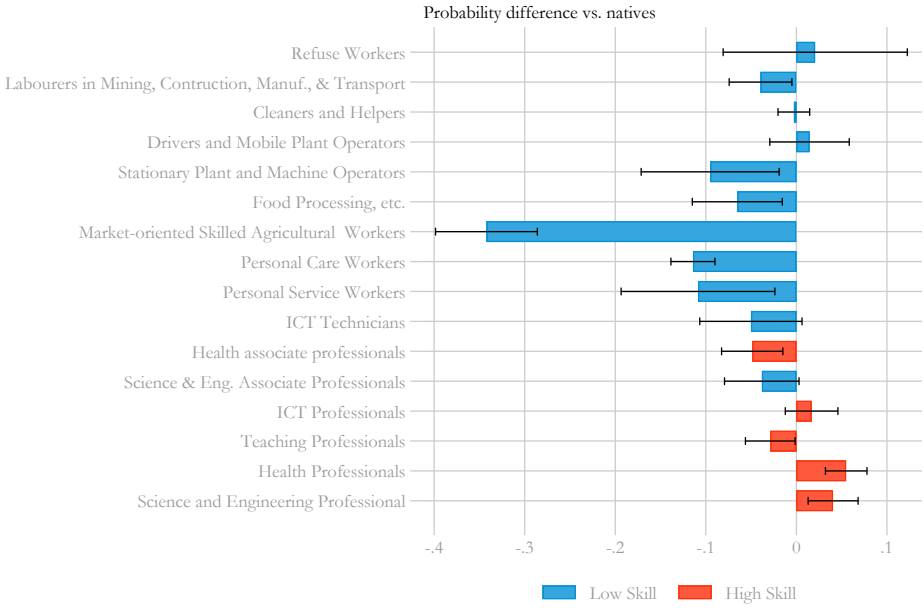
(a) EU Mobile



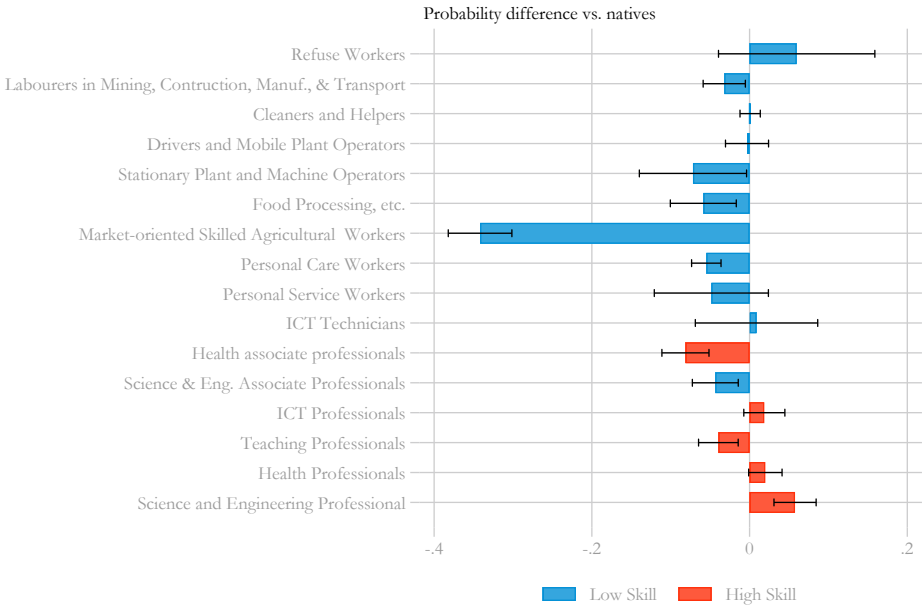
(b) Extra-EU

Note: The thick blue bars represent the difference in the probability of being in the top half of the monthly earnings distribution between natives and migrants. The thin black bars represent the 95% confidence intervals. The probabilities are estimated via OLS in a model controlling for gender, educational level, age, country of residence and migration status.

Figure 9: Native-Migrant Probability Gap in Being in the Top Half of Labour Earnings Distribution, by Key Occupation



(a) EU Mobile



(b) Extra-EU

Note: The thick blue bars represent the difference in the probability of being above the median of the monthly earnings distribution between natives and migrants.The thin black bars represent the 95% confidence intervals. The probabilities are estimated via OLS in a model controlling for occupation, gender, educational level, age, country of residence and migration status.

6 Are Migrants' Occupations Teleworkable?

In this section, we analyse whether migrant workers are particularly vulnerable to being dismissed (income risk) or to infection (health risk) depending on whether they are key workers or not and by looking at how migrants are distributed among teleworkable or non-teleworkable professions. Our measure of *teleworkability* is taken from Dingel and Neiman (2020). This measure is based on responses to two Occupational Information Network (O*NET) surveys covering "work context" and "generalized work activities." The 6-digits Standard Occupational Classification (SOC) is then mapped into the 2-digits ISCO classification available in the EU-LFS.

6.1 Key-workers

We first analyse the health-risk of migrant key workers. We do so by looking at the concentration of migrant workers in key occupation and the share of teleworkable jobs calculated with the Dingel and Neiman (2020) procedure. In Figure 10 we plot the share of migrants in each key occupation on the horizontal axis against the share of jobs that can be performed from home in each ISCO 2-digits category on the vertical axis. Panel 10a refers to EU mobile workers while Panel 10b to Extra-EU workers. The figure reveals a clear negative relationship highlighted by the red line of best fit drawn in the graph. Almost no job in the two professions with the highest concentration of migrants - cleaners and helpers and labourers in mining, construction, manufacturing or transport for both groups of migrants - can be performed at home. While the share of migrant in professions that can be more easily carried out from home - e.g. teaching professionals and ICT technicians - is below 5% for both groups as well. The figure highlights how the particular tasks that migrant key workers perform are exposing them to a high chance of contagion.

6.2 The Vulnerability of Migrant Workers Employed in Other Occupations

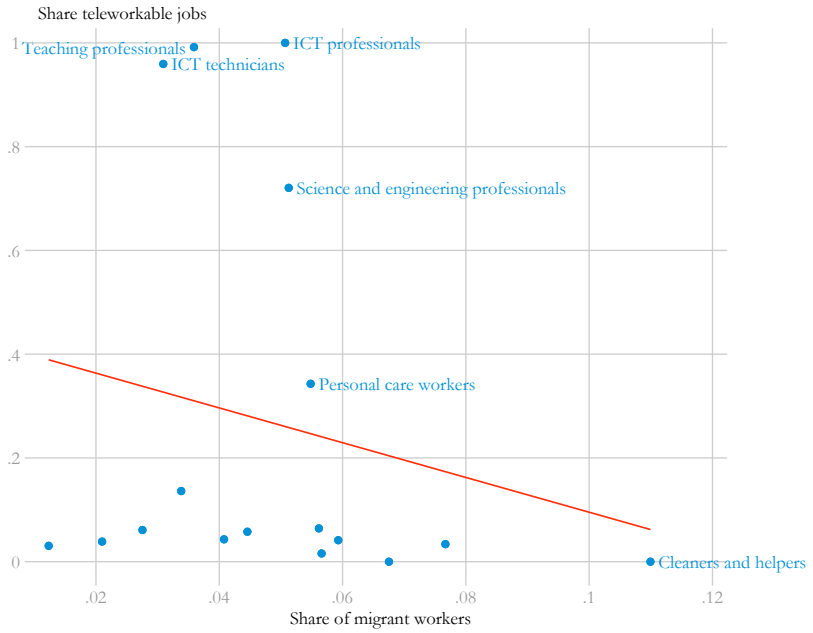
Despite their vulnerability in the labour market, migrant workers employed in key occupations in the midst of the COVID-19 pandemic may be less at risk of losing their jobs than equally fragile migrant workers who are employed in other non-essential occupations. Indeed, while key sectors are fully operational during the crisis (and possibly even experiencing an increase in demand), other sectors will suffer major losses in revenues, exposing workers employed in these latter industries to a higher risk of losing their jobs with respect to those employed in the former. We assess this income-risk by looking at the share of temporary contracts in each of the other occupations and the *teleworkability* index described above. Our assumption here is that workers with temporary contracts and whose job is hard to do from home, are those more likely to be dismissed in times of crisis.

In Figure 12 we plot the share of temporary contracts against the share of jobs that can

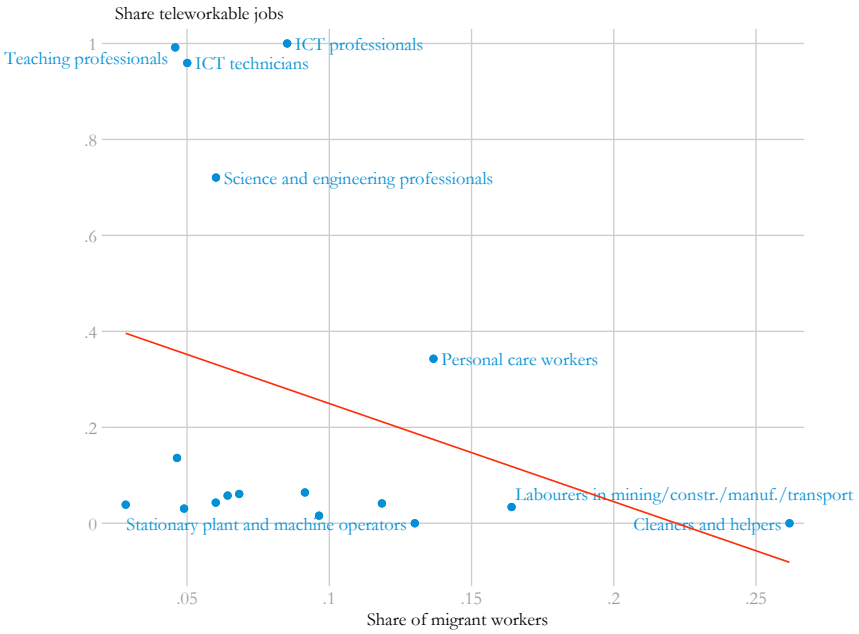
be performed from home by ISCO 2-digit occupations. Panel 12a describes this relationship for EU mobile workers while Panel 12b for Extra-EU workers. For reference, we have added two dashed line to the graph: The vertical line represents the mean share of works that can be performed from home by occupation over the entire sample, while the horizontal line represents the mean share of temporary contracts by occupation. The two lines create four quadrants, the bottom left quadrant includes all those occupations in which both the share of temporary contracts and the share of *teleworkability* is below the mean; the bottom right quadrant includes occupations below the average for share of temporary contracts and above the average for *teleworkability*; the top right quadrant includes occupations above the average for both measures; finally, in the top left quadrant we find all those occupations having an above average share of temporary contracts and a below average *teleworkability* index. Occupations in the top left quadrants are those whose workers are at higher risk of dismissal as their contracts offer less protection and their function cannot be carried out effectively during the lock-downs. In the graph, each dot represents an occupation and we have labeled and highlighted in red the five most common occupation for migrant workers who are not employed in the key-sectors as designated by European or national authorities. These occupations employ 42.3% and 42.5% of EU mobile and Extra-EU workers respectively. For EU workers (Panel 12a) two out the top five occupations lay in the bottom right quadrant where the least vulnerable professions are found, and the other three lay in the bottom left quadrant being below average in *teleworkability* as well as share of temporary contracts. The situation is certainly worse for Extra-EU workers (Panel 12b): in their case, four out of the five most common occupations lay in the top left quadrant where the high temporary/low *teleworkability* professions are found.

In Figure 14 we analyse the income distribution for those Extra-EU migrants employed in the four professions that we have identified as particularly vulnerable due to their high frequency of temporary contracts and low *teleworkability*. The figure highlights that these workers tend to earn lower salaries then the average worker employed in these occupations. More than half of them earn salaries in the bottom four deciles of the income distribution. This evidence shows that Extra-EU workers employed in these professions are particularly vulnerable due to the high risk of dismissal combined with their low incomes. Should they lose their job due the lockdown, they would be unlikely to be able to resort to private savings for subsistence during lockdown and until they are able to find another job.

Figure 10: Key Occupations: Teleworkability and Share of Migrant Workers



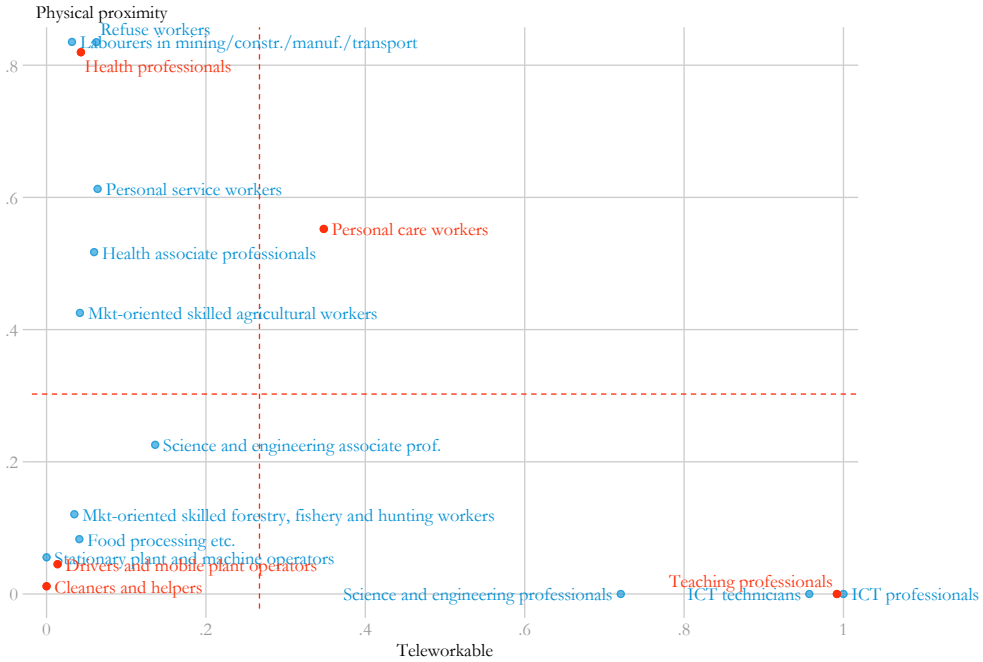
(a) EU Mobile



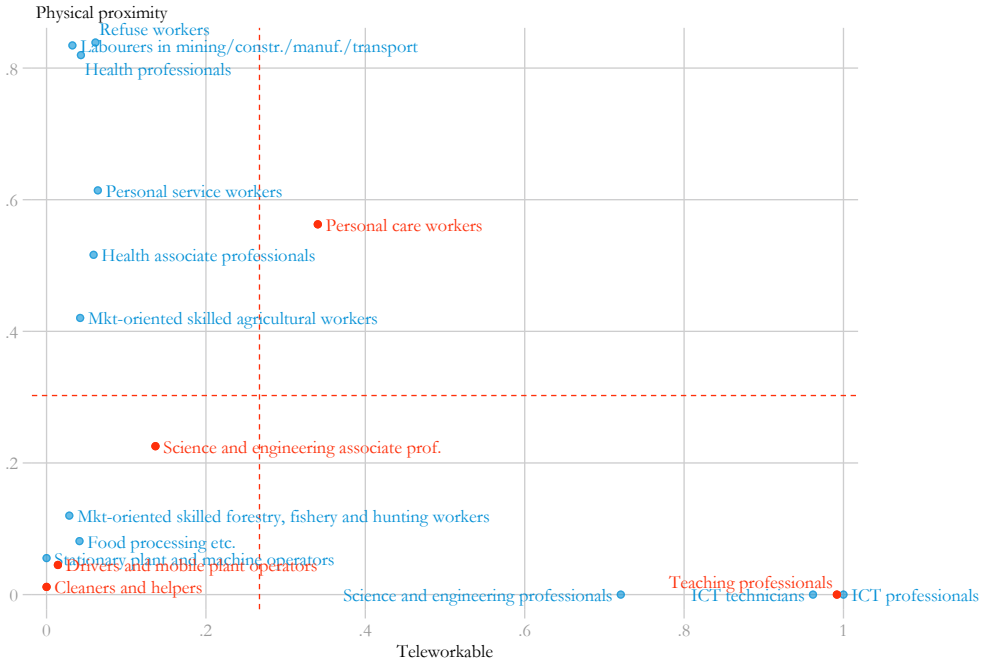
(b) Extra-EU

Note: The red line represent the line of best fit.

Figure 11: Key Occupations: Physical Proximity and Teleworkability



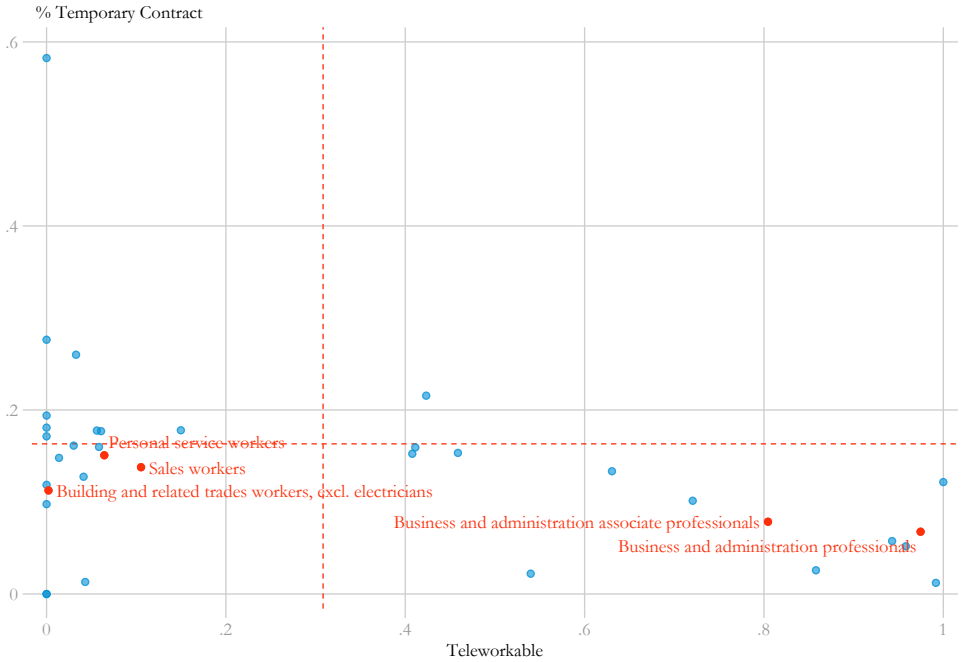
(a) EU Mobile



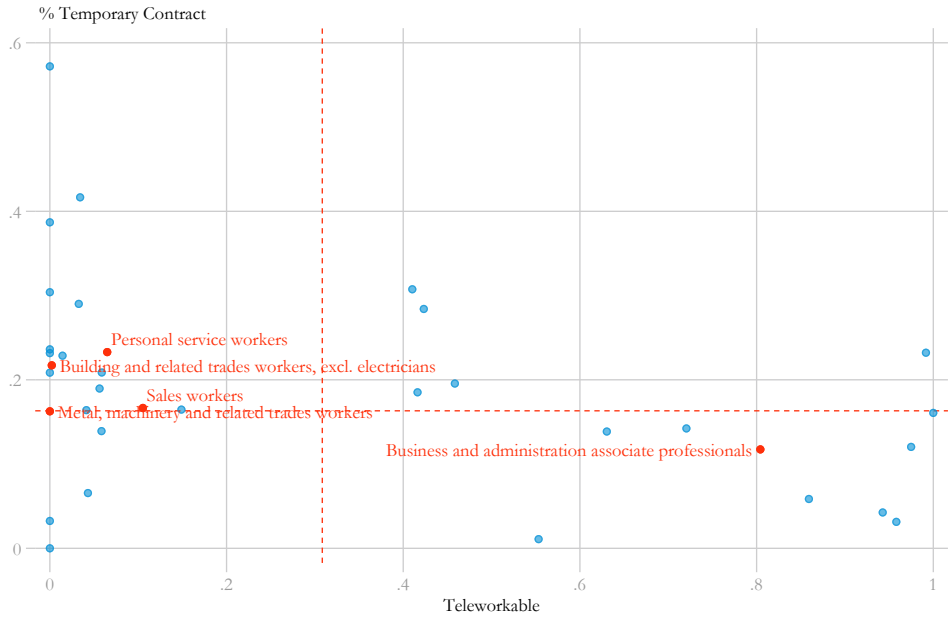
(b) Extra-EU

Note: The red dots represents the top 5 occupations for share of migrants. The vertical dashed line represents the average share of jobs that can be done at home by occupation; the horizontal dashed line represents the average for the physical proximity indicator.

Figure 12: Other Occupations: Temporary Contracts and Teleworkability



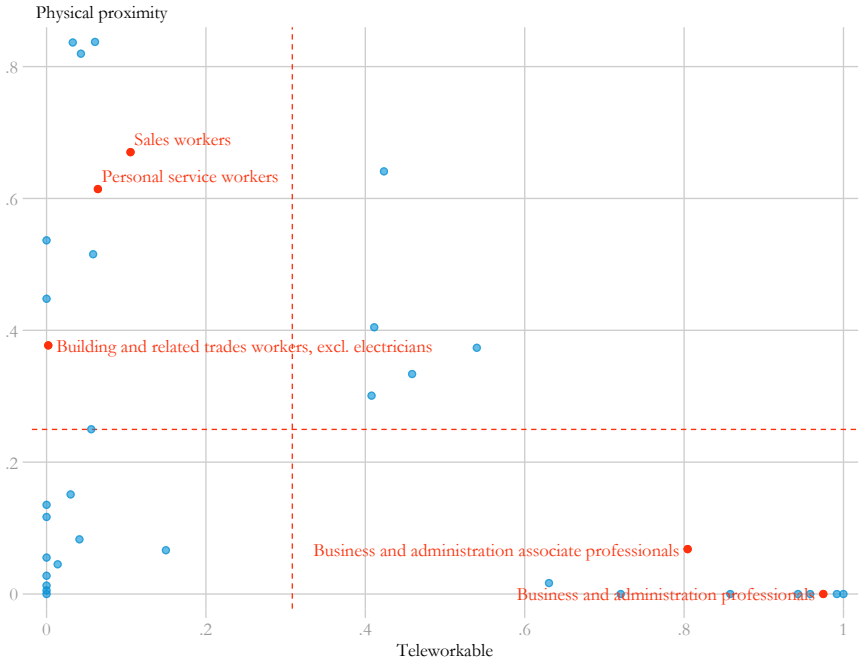
(a) EU Mobile



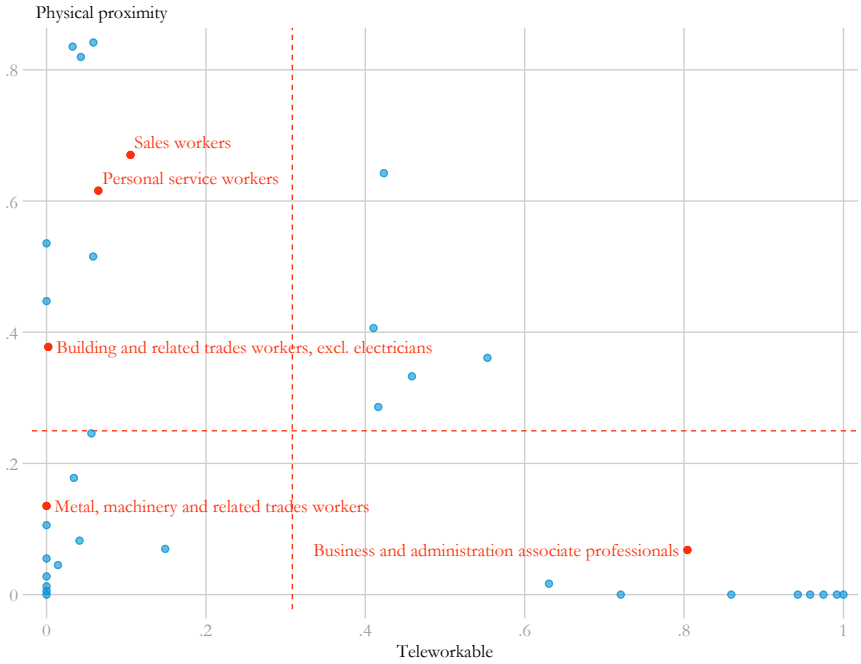
(b) Extra-EU

Note: The red dots represents the top 5 occupations for share of migrants. The vertical dashed line represents the average share of jobs that can be done at home by occupation; the horizontal dashed line represents the average share of temporary contracts by occupation for migrants.

Figure 13: Other Occupations: Physical Proximity and Teleworkability



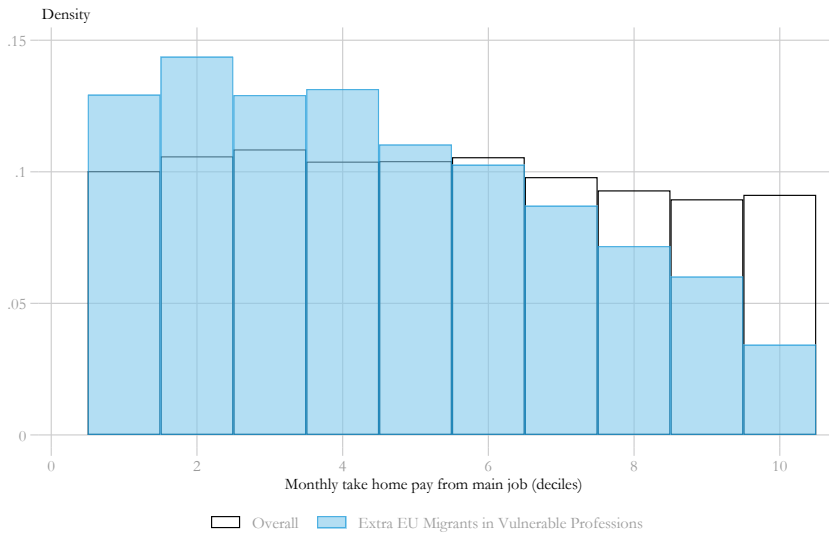
(a) EU Mobile



(b) Extra-EU

Note: The red dots represents the top 5 occupations for share of migrants. The vertical dashed line represents the average share of jobs that can be done at home by occupation; the horizontal dashed line represents the average for the physical proximity indicator.

Figure 14: Income Distribution Other Workers, Overall vs. Vulnerable Extra-EU



Note: The vulnerable professions are those found in the top-left quadrant of Figure 12b

7 Policy Implications and Conclusions

In Fasani and Mazza (2020) we show that migrant key workers are essential to keep European economies running even if at lower pace. In this report we analysed how these essential migrant workers fare compared to native key workers on three dimensions: the level of protection offered by their contract, their pay, and the possibility to carry out their function from home during the pandemic. What we find is that migrant key workers, especially Extra-EU key workers, are particularly vulnerable. They are more frequently employed under temporary contracts, earn lower wages and their professions are less amenable to be performed from home when compared to native key workers.

When we extend our analysis to the other workers not employed in the designated key-occupations, we find that also within this group migrant workers, and again, especially Extra-EU ones, are more vulnerable than natives. As for migrant key workers they earn lower wages, are more likely to be employed under temporary arrangements and in professions that cannot be performed from home. What changes for this group of migrant workers are the implications of these combined vulnerabilities. These workers are exposed to a high level of income-risk as they are forced by shelter-in-place orders to stay home, but at the same time are employed in jobs that are less amenable to teleworking and that more frequently rely on temporary contractual arrangements. The risk for these workers of being laid off is high, since their firing costs are extremely low and their employers are under strain due to the shut-downs. Additionally should they loose their jobs, they are unlikely to be able to fall back on personal savings as their income level tends to be low.

The evidence produced in this report calls for policy actions targeted at migrant workers that should possibly differentiate according to whether they have been defined as essential or non-essential workers. The urgency of implementing measures to support migrant workers during the pandemic crisis has been emphasized by international institutions such as the World Bank (2020) and think thanks such as the Overseas Development Institute (ODI).[9] The concentration of migrant workers in fixed-term contracts that we document, for instance, points at interventions on employers' incentives - via reduced taxation or subsidies - to renew these contracts and retain their workers. Migrants' lower earnings suggest the need for policy action on income support schemes, which may take the form of widening migrants' access to existing welfare programs as well as of creating new schemes that specifically target foreign workers. Finally, migrants' exposure to the contagion and to health hazard calls for interventions that remove - at least temporarily - existing barriers to full health care access for non-citizens. Not only migrants' welfare is at stake here, but it is also in the interest of hosting societies to create the conditions for migrant workers to keep contributing to the solution of the ongoing crisis and to the future recovery.

[9] See the ODI's initiative on "Migrants' contribution to the Covid-19 response" at: https://www.odi.org/migrant-key-workers-covid-19/.

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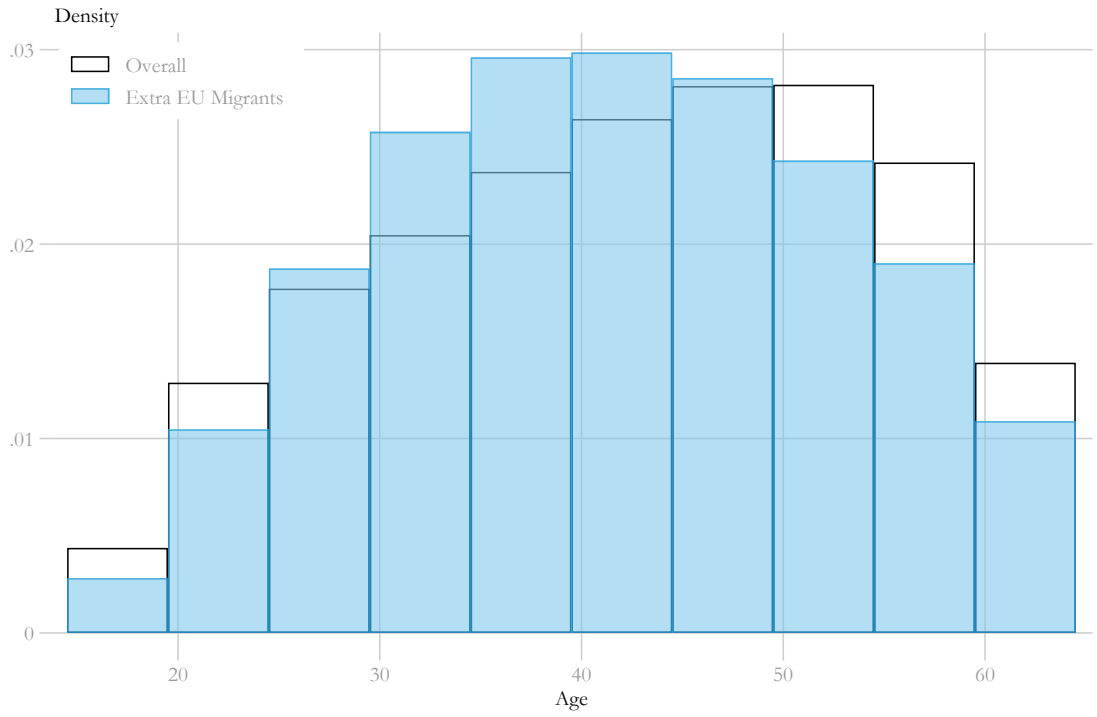
8 Appendix

Figure 15: Age Structure Extra-EU Migrants



Note: .

Table 3: Key Workers Occupations

ISCO-08 2 digits	**ISCO-08 3 digits**
Science and Engineering Professional	Life science professionals Engineering professionals
Health Professionals	Health professionals Medical doctors Nursing and midwifery Traditional and complementary medicine Paramedical practitioners Other health professions

Teaching Professionals	University and higher education teachers Vocational education teachers Secondary education teachers Primary school and early childhood teachers Other teaching professionals
ICT Professionals	Information and communication technology Software and applications developers Database and network professionals
Science & Eng. Associate professionals	Sci. and engineering assoc. professionals Physical and engineer science technicians Mining, manufacturing and constructions Process control technicians Life science technicians Ship and aircraft controllers and technicians
Health associate professionals	Medical and pharmaceutical technicians Nursing and midwifery
ICT Technicians	Information and communications technicians ICT operations and user support technicians Telecommunications and broadcasting technicians
Personal Service Workers	Travel attendants, conductors and guides Other personal services workers
Personal Care Workers	Personal care workers Child care workers and teachers' aides Personal care workers in health services
Market-oriented Skilled Agricultural Workers	Market-oriented skill agricultural workers Market gardeners and crop growers Animal producers Mixed crop and animal producers
Market-oriented Skilled Forestry Fishery	Fishery workers, hunters and trappers
Food Processing, etc.	Food processing and related trades workers
Stationary Plant and Machine Operators	Food and related products machine operators
Drivers and Mobile Plant Operators	Locomotive engine drivers Car, van and motorcycle drivers Heavy truck and bus drivers Ships' deck crews
Cleaners and Helpers	Domestic, hotel and office cleaners and helpers

	Vehicle, window, laundry and other cleaning workers
Labourers in Mining, Construction, Manufacturing	Transport and storage labourers
Refuse Workers	Refuse Workers

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