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A European quantitative analysis

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Abstract

Labour shortages have been rising steadily since recovery from the 2008-10 financial crisis, driven by increased demand and transitions in the labour market – digital, green and demographic. Covid-19 exacerbated the situation through a shift in workers' preferences, followed by growing demand in the post-Covid rebound. While these shortages are bad for the economy and can worsen working conditions for workers, they also offer opportunities in terms of bargaining power. While much of the ongoing debate focuses on the issue of specific skills shortages and possible solutions through reskilling/upskilling or expanding the labour force, primarily by migration, it is increasingly recognised that shortages are aggravated by bad quality jobs and that raising job quality is a way to compete for labour. Labour shortages may therefore increase workers' bargaining power, offering some counterbalance to the trends in the last decades of reductions in workers' relative power. This paper describes the link between labour shortages and job quality, particularly wages, at aggregate and individual levels. Wages indeed tend to be higher in sectors with higher labour shortages, and particularly so for workers with more vulnerable backgrounds – by gender, migration status or age – or lower bargaining power through less institutional support. When considering wider job quality there is some indication that work-life balance and the prospects of training, skills and career development are negatively affected by labour shortages. However, stronger worker representation can shield workers to some extent. This paper points out the complex relation between labour shortages and workers' job conditions and bargaining power.

1. Introduction

European labour markets weathered the Covid-19 pandemic rather well and retained employment through extraordinary government support (Zwysen et al. 2021). However, recovery has exacerbated the already existing issues of labour shortages where companies are clamouring for workers and struggling to fill vacancies (Eurofound 2021). In 2022, more than a quarter of businesses in the EU reported production problems due to labour shortages (Causa et al. 2022). It had already over the previous decade steadily become increasingly difficult to fill vacancies, particularly for some more technical profiles.

While labour shortages bring substantial problems for the economy in general, they may also provide opportunities for workers (Jalette 2023). Shortages, particularly as these are relatively widespread in otherwise lower-skilled occupations and sectors, provide options to workers who generally work in lower quality jobs and for lower wages. Such an increase in workers' bargaining power is particularly important given the context in which that power has been steadily undermined, as exemplified by widening inequality between firms (Criscuolo et al. 2020; Tomaskovic-Devey et al. 2020; Zwysen 2022) or by labour market concentration and wage setting power among employers (see e.g. Bassanini et al. 2024). All these processes have been helped along by greater digitalisation and by a reduction in institutional protections for workers as unions have declined and collective agreements lost their bite (see e.g. Berlingieri et al. 2017; Zwysen 2021, 2022; Zwysen and Drahokoupil 2023). Indeed, to return to the theme, in recent work in the United States, Aeppli and Wilmers (2022) show that wages have grown rapidly at the bottom, particularly as workers' bargaining power has increased with the rising demand for all types of workers. While there is some association with wages also in Europe, labour shortages do not seem similarly to benefit the lower-paid relatively more (Zwysen 2024).

The variation in industrial relations systems across Europe – with wide differences in the level of collective bargaining, coverage and organisational power of trade unions and worker organisations – makes it particularly important to study the extent to which shortages affect workers' bargaining position through bargaining and social dialogue. The key question is how labour shortages affect workers' wages and outcomes depending on the institutional context.

The next section first describes the overall trends in labour market shortages over time. It then develops the argument on the link between labour market shortages and workers' bargaining power that will be the focus of the paper. Section 3 describes the combination of data used in this paper: first, a combination of

aggregate data on shortages and earnings at country-industry level; and, second, the link between these shortages and individual wages through micro-analysis of the EU Statistics on Income and Living Conditions (EU-SILC) as well as to wider job quality through micro-analysis of the European Working Conditions Survey (EWCS). The fourth section presents the complex relation where shortages are indeed higher where wages are relatively lower but, over time, rising shortages are also associated with rising wages; and then the relation between worker representation and individual bargaining that is supported by labour shortages.

2. Background

2.1 Evolution of shortages

In the past decade or so, since the financial crisis and exacerbated by the Covid-19 pandemic, the labour market has become increasingly tight with rising shortages of workers. These shortages are seen as a major issue on the labour market (see e.g. Eurofound 2021; Causa et al. 2022; European Commission 2023; Zwysen 2023). As businesses struggle to fill vacancies and attract enough workers, this can hinder their output and growth (European Commission 2023; Groiss and Sondermann 2023; Le Barbanchon et al. 2023), as well as affect the intensity of work and wellbeing for those workers who are in post. As shortages are particularly acute in some public service sectors, particularly healthcare, this also has more widespread societal effects (Eurofound 2023).

The current high level of, as well as the rapid increase in, labour shortages has several drivers, both structural and cyclical. First, the European labour market is undergoing three major transitions which may be contributing to the rising shortages or which are feared to be exacerbating them (Zwysen et al. 2024). The demographic transition implies a reduction in the workforce through ageing. While so far this has been offset by the rising employment rate, there is a fear that in the near future the labour force will shrink (Schippers 2023). Second, the green transition suggests growing demand for specific technical skills as well as a larger demand for many support-level jobs, including lower skilled ones (Vona 2021; Cedefop 2022; Vandeplas et al. 2022). While the green transition will create jobs and raise demand, it will also destroy some jobs. Creation is expected to outweigh destruction, but it is further unclear that those workers losing jobs can easily transition to the new ones (see e.g. OECD 2024). Finally, the digital transition transforms labour markets and, through complementarities, increases the demand for specific digital and technical skills that are already in high demand globally (European Commission 2023). These trends are combining to reduce the share of available workers while, at the same time, increasing demand for them, particularly for those with a specific skill type.

Labour shortages can also reflect a mismatch where workers are available, but either do not have the correct skills or where they are in different regions or areas than the jobs (West 2013; European Labour Authority 2023). The role of geographical mismatch seems limited as many of the current shortages are shared across Europe or even globally (McGrath 2021; European Labour Authority 2023). While skills mismatch is likely to be important, the Beveridge curve – plotting labour shortages against available workers – indicates that there is not a

large available workforce with the wrong skills, implying the issue is mainly one of finding workers willing to do the work (Kiss et al. 2022). Indeed, a substantial part of shortage occupations are also not particularly highly skilled, but rather consist of strenuous and low-paid work (Eurofound 2021; Zwysen 2023). It is, however, important to highlight the heterogeneity of shortages – this one concept covers a variety of issues including mismatch, a lack of skills and relatively poor working conditions.

Shortages also increased more rapidly during and immediately following the Covid-19 pandemic. This was mainly due to a faster than expected recovery and increased demand, as well as a shedding of workers in specific, often lower-paying, sectors during the pandemic who then did not all come back to work or who found other jobs (Causa et al. 2022; Duval et al. 2022; European Commission 2022). There also seems to have been a re-evaluation of jobs, with particularly lower-paying and contact-intensive jobs finding it increasingly difficult to attract workers (Causa et al. 2022). This was particularly the case in the United States with the 'Great Resignation' (Ferguson and Hoover 2024), but less so in Europe. The pandemic particularly affected lower-paid sectors and workers – with the young, the older, those in more precarious posts and on temporary contracts more likely to have lost their jobs, and not always having made their way back to the labour market or to the same post (Zwysen et al. 2021; Duval et al. 2022).

In their in-depth analysis of the trends and drivers of shortages in Europe, Groiss and Sondermann (2023) show that a key part of the variation between firms in experiencing shortages, prior to the pandemic, was due to structural factors such as educational profile, types of contracts and regional employment characteristics. Cyclical factors also played a role but were less crucial.

2.2 Addressing shortages: how to attract workers?

At firm level, there are several possible actions to be taken: first, the job can be made more attractive by increasing wages, training opportunities or telework; second, the hiring pool can be expanded by either looking further out or relaxing hiring standards and training more on the job. Otherwise, the decision can be made not to fill the vacancy which then limits growth (Morisette 2022; Le Barbanchon et al. 2023).

Several proposals have been made to address labour shortages structurally, with most discussion focusing on (1) increasing skills through training, upskilling and reskilling; and (2) attracting more workers, primarily through greater mobility and migration. These are also the cornerstones of the European Commission Action Plan to tackle labour and skills shortages. Migration can definitely play a role and is already generally higher in those sectors and jobs with shortages. Still, migrants in Europe generally face disadvantage on the labour market compared to the native-born population, which raises the risk of exploitation for these workers (Zwysen and Akgüç 2023). Similarly, while skills are definitely important, and a lack of specific skills is at the heart of some reported shortages, such as in the IT sector or for specific medical professions, they do not explain the heightened

shortages in some lower – or intermediate – occupations. Importantly, when attracting more workers it is also important to consider inactivity rates in Europe which remain rather high in some countries with high shortages, such as Belgium, despite being at relatively low levels overall (Zwysen et al. 2024).

More attention is now being given to the link between shortages and quality of jobs – wages as well as wider conditions (Schweitzer and Khattar 2021; Weber and Adăscăliței 2023; Zwysen 2023). This is likely to be particularly important in terms of attracting workers to shortage sectors and in activating workers overall. Crucially, there is considerable variation in how firms attempt to attract workers. Morisette's overview (2022) shows substantial constraints in some sectors in not being able to offer higher wages or teleworking while others are able to do so. In their study, Le Barbanchon et al. (2023) find that firms are mainly increasing wages for higher-skilled and higher-educated workers, and particularly in more cognitive non-routine tasks. This may then mainly be used to attract more of those with scarce skills profiles, but is less the case for lower-skilled workers.

This points to the potential double relation between labour shortages and working conditions – openings may be particularly difficult to fill, thereby increasing shortages, in those sectors and jobs where conditions are more difficult and pay is lower. On the other hand, shortages already do lead to higher wages and better conditions in order to attract workers (Kölling 2022; Morisette 2022; Groiss and Sondermann 2023). In this sense, tight labour markets also provide an opportunity for workers (Kölling 2022; Ståhl 2022; Zwysen 2023).

2.3 Workers' bargaining power

While shortages are costly for the economy and to workers (Groiss and Sondermann 2023; Le Barbanchon et al. 2023), they also offer opportunities (Jalette 2023). Labour shortages lead to greater bargaining power for workers relative to their employers. This is particularly relevant in a context in which workers' bargaining position has been declining gradually (see e.g. Paternesi Meloni and Stirati 2022; Lombardi et al. 2023). Bargaining power is relevant in an imperfect labour market, such as this one, where wages are not set at the level of marginal revenue productivity but rather reflect the balance of power between employers and employees. This can be due to several factors, such as frictions and costs in the job search process where job seekers are at an informational disadvantage (Mortensen 2003; Moscarini and Postel-Vinay 2018); labour market concentration and monopsony where employers have pay-setting power (Marinescu et al. 2021; Araki et al. 2022; Bassanini et al. 2024); or through rent sharing (Card et al. 2017; Song et al. 2019).

In the presence of labour shortages, workers have more options, thereby improving their relative bargaining position. This is the argument made already by Okun and colleagues (1973) regarding the benefits and opportunities for upward mobility in a 'high-pressure' economy. In the United States this has, for instance, led to a substantial decline in wage inequality as particularly lower-paid workers have seen substantial increases in pay (Aeppli and Wilmers 2022). This may indicate

their low bargaining position prior to the rise in shortages, as wages had previously been stagnating at the bottom. While there is some association between wages and labour shortages in Europe too, this has not similarly affected the lower paid as much (Zwysen 2024).

A key difference between the US and Europe lies in labour market institutions, which strengthen workers' bargaining positions relative to their employers in the latter (Blanchet et al. 2022; Bassanini et al. 2024; Zwysen 2024). Importantly, many workers in Europe are covered by collective agreements with regard to their wages and other working conditions. The type of agreements differ as they can be either at a centralised level, such as national or sectoral agreements, or at firm level or another decentralised type (Denk et al. 2019; Garnero 2021). These agreements provide a premium on wages, similar to the union premium, which comes as a benefit of collective bargaining (Zwysen and Drahokoupil 2023). However, such collectively negotiated wages may be less responsive to short-term changes. There may then be greater competition in other, non-wage, benefits of the job. In a very relevant paper, Kölling (2022) shows that, in Germany, prior to the pandemic, firms that experienced labour shortages did increase wages by paying a premium, but not when covered by a collective agreement. Kölling asserts that this was because workers covered by agreements already had higher wages. Shortages thus led to a closing of the gaps between them.

2.4 Job quality more widely

Crucially, this discussion has focused so far only on earnings, but job quality is a much broader concept going beyond money (Muñoz de Bustillo 2011; Piasna 2023). Following the ETUI Job Quality Index, there are several key dimensions of job quality: forms of employment and job security; working time and work-life balance; working conditions; skills and career development; and collective interest representation and voice (Piasna 2023). These dimensions, particularly those regarding work-life balance and working conditions, may be particularly negatively affected by labour shortages as vacancies remain unfilled. On the other hand, employers may also try to attract workers by offering better conditions, particularly in the sense of career prospects and training, or better hours and greater job security. It could thus be expected that labour shortages also affect job quality more widely than wages alone.

Importantly, worker representation is expected to affect these different aspects of job quality in a more straightforwardly positive fashion than earnings, because they would help shield workers from the worst impacts of shortages while also allowing them to negotiate further benefits. Indeed, they would not be constrained in the same way as with pure wages where the collective agreement process, being more institutionalised, may not adjust as quickly to short-term trends.

2.5 Expected relations between wages and labour shortages

This paper addresses open questions on the links between job quality, particularly wages, and labour shortages across Europe. More specifically, how are wages related to labour shortages and how do wages react to labour shortages? It is further crucial to address the heterogeneity in how labour shortages affect workers – by their sociodemographic position and by the institutional support they experience – as bargaining power also varies strongly between groups. This is important in understanding how to address labour shortages and what, if any, opportunities for greater equality this holds.

It is important to note here that this paper merely describes the relation between shortages and wages, as well as wider job quality, but cannot assert causality. First of all, the methods used here do not allow for causal estimates, and second these relations are expected to be complicated and, to some extent, circular.

Shortages grow for various reasons and across a variety of countries, sectors and occupations. However, given the ongoing competition for labour, shortages are expected to increase relatively more in those settings where wages are relatively low compared to other opportunities within an economy.

Hypothesis 1 is then: *shortages are rising across a variety of sectors and jobs, but they are rising more in relatively lower paying jobs.*

While employers have several options open to them in response to rising shortages, such as searching more widely, relaxing skills requirements and offering more training on the job, or not filling vacancies at all, one option often taken is to increase wages (Green et al. 2020; Kölling 2022; Morisette 2022; Groiss and Sondermann 2023).

Hypothesis 2 is: *within a specific type of job, rising shortages are associated with rising wages.*

Generally, greater demand for workers would be particularly important for workers who are at a disadvantage and generally have lower bargaining power – as their wages would be more compressed to start with. More disadvantaged groups could then benefit in particular. These are especially likely to be younger workers – who have less experience; women – who generally can commute less far and have fewer offers to choose from (Cardoso et al. 2016); migrant workers – who face greater disadvantage due to possible discrimination or discounting of their human capital (Zwysen et al. 2021); or workers in precarious working positions.

Hypothesis 3 is: *rising wages particularly benefit workers who are more socioeconomically vulnerable and have relatively lower bargaining power – the young, women, the lower educated and migrants.*

On the other hand, wage growth may particularly be an option in more profitable sectors where specific skills profiles are in need, in which case shortages may benefit those profiles that already have higher wages.

Relatedly, greater individual bargaining power is especially expected to affect the wages of workers who are not yet covered by collective agreements and who are at more of a disadvantage in that sense. These workers generally have lower earnings and a relatively worse bargaining position. In the short run it could be expected that the premia related to union density or collective agreement coverage is reduced somewhat. At the same time, in the long term the position of workers' representatives is likely to be strengthened in collective bargaining leading to better outcomes. While this is not studied here, it could also be expected that shortages are relatively less problematic where conditions are better, such as when workers are covered by collective agreements.

Hypothesis 4 is then: *rising wages in the short term particularly benefit workers with relatively lower institutional bargaining power; namely, those who do not benefit from sectoral or national collective agreements.*

Finally, it could be expected that labour shortages affect wider job quality with a particularly negative impact on actual working conditions – mainly the intensity of work – but a more positive impact in terms of job security and prospects. Crucially, worker representation is expected to shield workers from the more negative aspects.

Hypothesis 5 is then: *wider job quality is affected by labour shortages in different ways, but worker representation can shield workers from the more negative effects.*

3. Data and methods

3.1 Panel data of shortages

3.1.1 Measuring labour shortages

Labour shortages are measured in three main ways in this paper. First, reports by business managers are used to indicate whether labour shortages are an issue for their company in terms of limiting production. This question is asked quarterly in a survey of businesses and is available at subsector level for manufacturing, building and services (European Commission 2022). The share of businesses reporting labour shortages – as a limiting factor in their production or output – is then taken as an indicator of labour shortages (Groiss and Sondermann 2023). A second indicator is the job vacancy rate – the proportion which open vacancies bear to all jobs, both filled and where there are open vacancies, provided per country, 1-digit industry, year and quarter (Eurostat: jvs_q_nace2). The third indicator of shortages is at occupational level, indicating that a specific occupation (at 3 or 4-digit level) was mentioned as an occupation of high shortage in the European Union in the latest report on shortages and surplus occupations referring to 2022 (European Labour Authority 2023). This indicates that a specific occupation is experiencing high shortages.

3.1.2 Linking with industry characteristics and labour costs

To analyse trends in labour shortages, the share of businesses reporting labour as a limiting factor, and the job vacancy rate, are combined with characteristics of the industry over time obtained from Eurostat,[1] and with information from more detailed industries obtained by Structure of Earnings Survey microdata from the 2010, 2014 and 2018 waves. This is weighted and provides more detailed information per wider industry for that period regarding total earnings; the share of workers that are lower (at most lower secondary), intermediate (upper secondary or non-tertiary) and high (tertiary) educated; the share of workers that

1. More specifically, employment per industry-year from national accounts at 2-digit industry level (nama_10_a64), information on wages and salaries, other costs and total compensation per industry (at the more aggregate 1-digit level) per country-year (lc_lci_lev); the distribution of workers at aggregated industry by age (15-24, 25-49, 50-74) and by sex (lfsa_egan22d); and the distribution over 1-digit occupational groups at 1-digit industry (lfsq_eisn2).

are on a temporary contract; the share of workers that are in a publicly controlled company; and the share of workers covered by collectively agreed wages – either any agreement, a sectoral or national (central) agreement, or a company (decentralised) agreement. This information is interpolated between waves at country-industry level and extended beyond 2018. The wage information is used to estimate ratios of the average wage in a detailed industry over the average in the wider industry, these ratios then being used to extend the trends on compensation from Eurostat at the 1-digit industry level to lower-level industries.[2] Using these different sources, a dataset at country-industry-year level has been created for 2008 to 2024 across EU Member States.

3.1.3 Describing the aggregate relation between wages and labour shortages

This data is used to describe trends in shortages and wages over time by groups of industries, aggregated from 2-digit NACE groups, and to analyse the link between shortages and wages.

The link between wages and shortages is tested by estimating a stepwise pooled regression over time, as shown in equation 1. The outcome is an indicator of shortages – either shortages of labour as a limiting factor or the job vacancy rate. This is regressed on the logarithmic transformation of real wages, deflated by the HCIP, controlling for vector X including the share of women, the share of young workers, the share of older workers, the share of low-skilled, elementary occupations and the share of professional-managerial occupations. The analysis is weighted to account for relative size and includes country and year fixed effects (M1), country, year and industry fixed effects (M2 and M3) or country by industry and year fixed effects (M4 and M5). M3 and M5 are restricted to those industries that had high shortages in 2023 – that is, where more than a quarter of businesses reported labour shortages as a limiting factor. The aim of this analysis is to analyse the association between wages and labour shortages, and whether these are on average higher or lower when wages are higher. By varying the fixed effects, the analysis tests whether this association holds in the pooled sample or whether there is a relation within a specific industry in a country.

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2. As an example of the use of industry information: for a specific detailed industry, such as food manufacturing (part of the aggregated manufacturing industry), the information on labour shortages as a limiting factor comes from the business confidence survey at that level, while Eurostat provides information on the size of the food manufacturing industry; the job vacancy rate would be at the level of manufacturing as a whole, as would the share of age groups, occupational groups and gender. From the SES there would be information on the share by skill groups in food manufacturing in 2010, 2014 and 2018 which could be interpolated for the years in between; as would the level of wages in food manufacturing which could be used to estimate the percentage which wages in food manufacturing bear to manufacturing as a whole. The level of wages would be available yearly for manufacturing and, to get at the wage trends within specifically food manufacturing, the aggregate wage would then be multiplied by the percentage that the more detailed segmented level wage bears to the industry as a whole, drawn from the SES. As an example, if the average wage in the SES at the more detailed segmented level of food manufacturing is, on average, 80% (for the sake of the example) of the total manufacturing wage, the trend for manufacturing per country-industry-year and for food manufacturing is imputed to be 80%.

Equation 1

$$y = \alpha + \beta_1 * \ln(wages) + \beta_2 * X + country + year\ (+industry)\ (+country * industry) + \varepsilon$$

3.2 EU-SILC microdata

3.2.1 Describing data

The second step of the analysis is done with microdata from European Statistics on Income and Living Conditions (EU-SILC) between 2007 and 2022, which is an annual household survey conducted in the EU. It includes detailed information on income, including cash or near-cash income from work in the reference year – generally the previous calendar year. The sample is restricted to those aged 18 to 64 in the survey year, with non-missing information on gender, education and employment status. The dataset is restricted to current employees who received an income from work in the reference year in 25 EU Member States, excluding Croatia and Malta.

Hourly wages are derived from annual gross wages by making use of monthly activity information and median hours (by gender) spent in a country-year in such an activity (see also Brandolini et al. 2010). Wages are adjusted to real 2015 wages in order to assess correctly the changes over time in real wages, with the deflator obtained through Eurostat. As the wages refer to the previous year – or the previous 12 months in the case of Ireland – all results are shown in the reference year; that is, the year before the survey year.

EU-SILC also includes a variable indicating that workers had changed jobs in the last year and, if so, what the main reason was. This is used to create an indicator variable for being a job mover, and an indicator variable for being a job mover by reason of moving to a better job.

3.2.2 Merging labour shortage data to EU-SILC

To analyse the extent to which shortages affect wages directly, the information described above – business descriptions of labour shortages as a limiting factor; shortage occupations; and the job vacancy rate – are aggregated to industry level using EU-SILC (13 categories) and 2-digit occupation (indicating a shortage occupation is present), and then merged. This seeks to explain individual labour market positions depending on aggregate labour shortages.

3.2.3 Associating individual wages with labour shortages

The analysis then links the individual log of hourly wages, or the probability of moving, to labour shortages at country-industry-year or occupational level, with

the appropriate cross-sectional weights, controlling for gender, age, migrant status (born in the EU or a third country rather than the country of residence), highest obtained qualification, urbanity (dense area, rural area, or missing, suburban being the default), hours worked and whether working part-time, self-employed or under another category. The analysis also includes fixed effects for country, year, occupation and industry to account for common trends. Information on all variables is shown in Table A1.

Equation 2 shows this model for outcomes y – log real wage, or the probability of moving (estimated through a linear probability model) – for individuals 'i' in country 'c' at time 't' in industry 'j' and occupation 'o'.

Equation 2

$$y_{icjto} = \alpha + \beta * shortages_{cjt} + \gamma * X_{icjt} + country_c + year_y + occupation_o + industry_j + \epsilon_{icjt}$$

In a further step, heterogeneity in the relation between log real wages and shortages is addressed by interacting shortages with sociodemographic or institutional factors that are assumed to moderate the relation between shortages and wages, as shown in equation 3. First, whether workers had moved in the last year or not – to test that recent hires are more likely to receive higher wages. Second, this is interacted with union density by sector from the ICTWSS database (Visser 2019) and the share of workers covered by any collective pay agreement, a sectoral or national one, or a company one. To test for variation between sociodemographic groups, an interaction is included with indicator variables for being on a temporary contract, being a woman, being young (aged 29 or less), being a migrant or having lower than tertiary qualifications.

This analysis uses more aggregate levels of industry, but it has the benefit of having detailed information on individual wages and on the variation over time.

Equation 3

$$y_{icjto} = \alpha + \beta_1 * shortages_{cjt} + \beta_2 * interact_{icjt} + \beta_3 * shortages_{cjt} * interact_{icjt} + \gamma * X_{icjt} + country_c + year_y + occupation_o + industry_j + \epsilon_{icjt}$$

3.3 EWCS microdata

3.3.1 Describing data

Finally, the European Working Conditions Survey (EWCS) from 2015 and 2021, in the latter case a shorter version of the usual survey carried out by telephone due to the pandemic (EWCTS), assists with the analysis of job quality more widely. The data is used to calculate four of the dimensions of the Job Quality Index as detailed in Piasna (2023). Each indicator is scaled from 0 to 100 with 100 being a more positive outcome. Each item has the same weight in the subdimensions and

each subdimension has the same weight in the final Index. The first dimension is the form of employment and job security, measured by whether workers are on a temporary contract of one year or less, on an involuntary part-time contract and whether they fear losing their job in the next six months. The second dimension is working time and work-life balance, captured by whether workers work more than 48 hours a week, whether their working hours fit with their family and social commitments (not at all well, not very well, well, or very well) and whether workers work at standard times – not nights, Sundays or on shifts – and have fixed times of work. The third dimension is working conditions, developed from three scales: one for work intensity; one for work autonomy or discretion over the order of tasks, the methods of work and the pace of work); and the presence of physical risk factors such as exposure to health risks or hard physical work). The final dimension considered here is skills and career development, captured by whether respondents received training paid for or provided by the employer in the last 12 months and whether the job offers good prospects for career advancement.

3.3.2 Associating shortages and job quality

In order to analyse the link between labour shortages and job quality, the reported labour shortages as well as job vacancy rates are merged at country-industry-year level to the 2015 and 2021 waves of the EWCS. As this only consists of two waves, including one carried out during the Covid-19 pandemic, this analysis should be considered as indicative.

Each dimension of job quality, including the composite, is regressed on labour shortages – separately measured by job vacancy rates and reported shortages – controlling for gender, highest obtained qualification, age (squared), the presence of a dependent child in the household and size of firm, as well as industry, country, year and 2-digit occupational codes. The labour shortage indicator is then, in a second step, interacted with whether there is a worker or trade union representative in the workplace. Equation 4 shows this relation for individuals 'i' in country 'c' at time 't' in industry 'j' and occupation 'o'. Table A2 in the appendix describes this sample.

Equation 4

$$y_{icjt} = \alpha + \beta_1 * shortages_{cjt} + \beta_2 * interact_{icjt} + (\beta_3 * shortages_{cjt} * interact_{icjt}) + \gamma * X_{icjt} + country_c + year_y + occupation_o + industry_j + \epsilon_{icjt}$$

While this analysis has the great benefit of having detailed industry level information, there is no variation over time. This is the reason why both EU-SILC and EWCS data are shown here.

4. Results

4.1 Trends in Europe

4.1.1 Describing labour shortages over time

This section first describes the evolution of labour shortages, as measured through companies' reported experiences and the job vacancy rate, across Europe. It then describes the link between shortages and wages at this aggregate level.

Figure 1 illustrates how labour shortages – as the share of enterprises mentioning this as a factor limiting production or output (left), and the job vacancy rate (right) – have increased over time. The figure shows the distribution of labour shortages per quarter over all groupings of country and industry, highlighting how the 10th, 25th, 50th, 75th and 90th percentiles[3] of labour shortages move over time.

First, this shows a general increase in shortages. The left panel shows that the median share of businesses in a country-industry reporting that labour shortages are hindering production rose after the financial crisis to around 20% in 2019. There was then a brief Covid-19 dip followed by a sharp increase with a peak towards the end of 2022 at around 30%. The right panel shows that the job vacancy rate rose similarly to around 2% in 2019, then declined during the pandemic before rising rapidly until 2022.

Second, there is a large difference between countries and industries in their experiences as can be seen from the distributions. Shortages, both as companies reporting them as limiting factors and as measured through the job vacancy rate, rose little at the 10th and 25th percentiles, but increased massively at the 75th and especially the 90th ones where it more or less doubled from 2012 to 2022. This means that there is an increase in the intensity of labour shortages among the most affected industries and countries. This is key as it indicates a larger variation between industries and countries in Europe with how shortages increase, and it is this variation that can point to the factors supporting workers.

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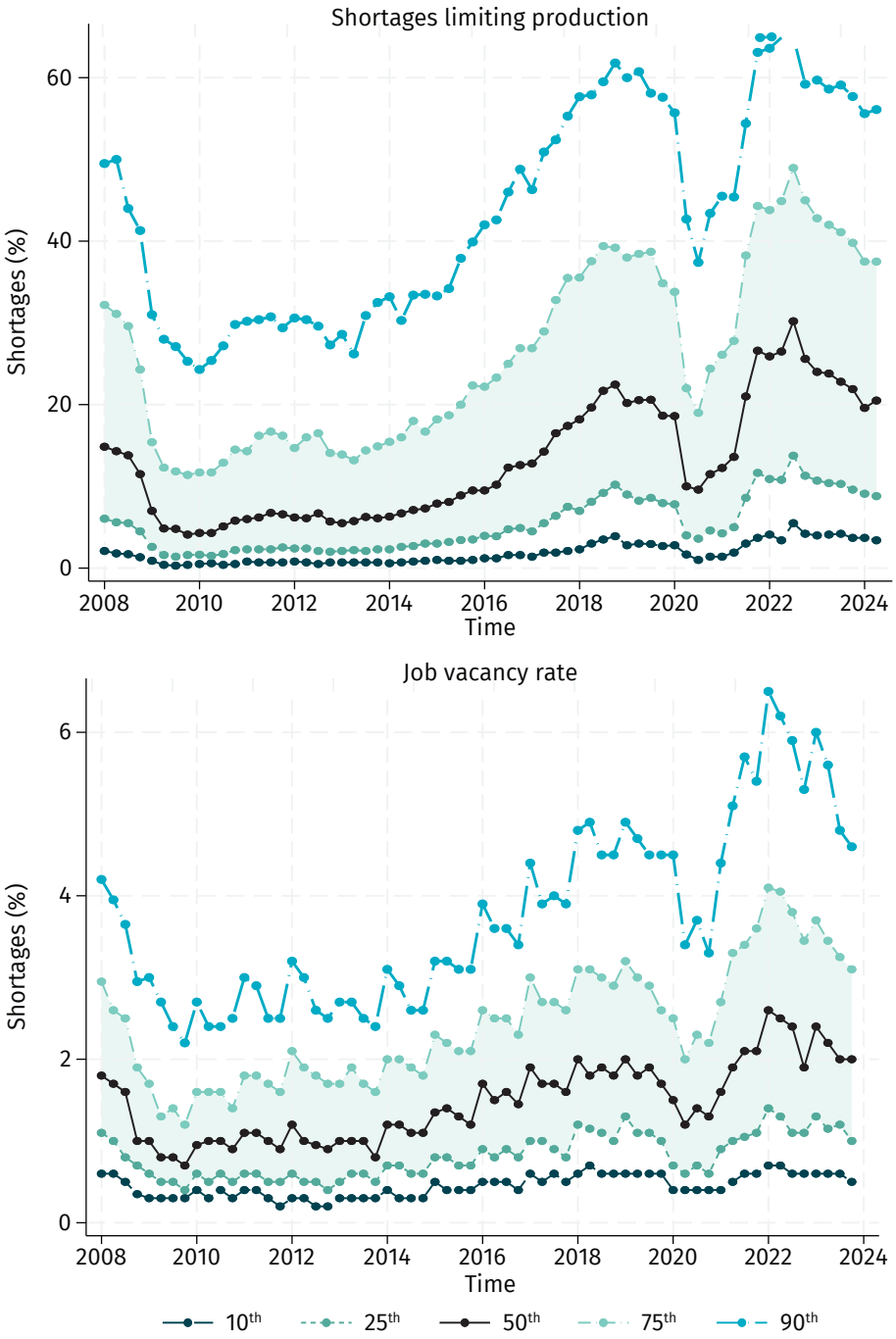
3. If all observations for country-industry groups in a given year-quarter are ranked from lowest to highest, a percentile is the value of the observation that lies at that point in the distribution; for instance, the 25th percentile would be the value of the observation that is at the 25th% mark of this ranked distribution. Practically this means that 25% of all values in that country-year lie below this percentile and 75% lie above.

Third, the figure shows that both measures of labour shortages follow somewhat similar patterns.

Figure 1 **Labour shortages increase rapidly over time**

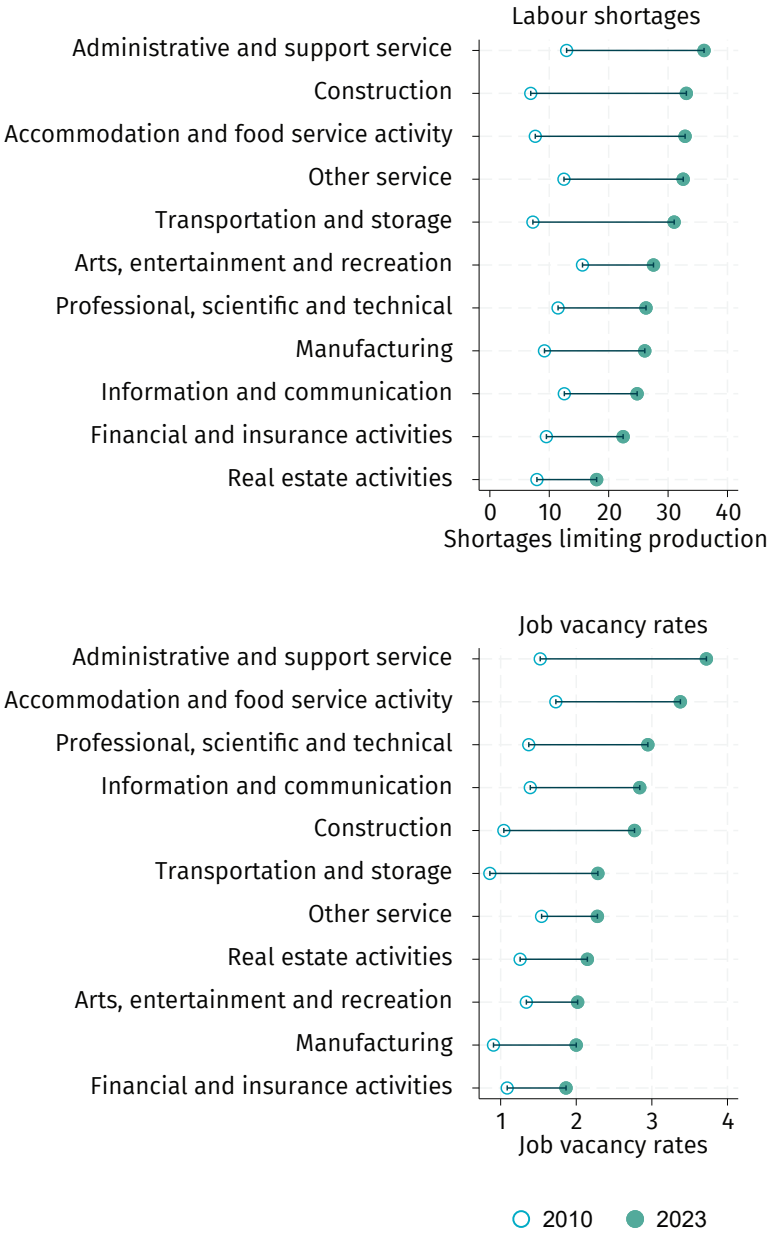


Note: the figure shows the percentiles of shortages – reported by businesses on the left and the job vacancy rate on the right – over EU countries and industrial sectors per year. Industry is 2-digit NACE for shortages of labour as a limiting factor and 1-digit NACE for the job vacancy rate.

Sources: Business and Consumer Survey (top) and Eurostat job-vacancy rate (bottom).

Figure 2 then describes how different sectors are affected. The rise is particularly large in administrative and support services, construction, accommodation and food services; and far less in real estate activities, financial and insurance activities, and arts, entertainment and recreation. Crucially though, labour shortages and unfilled vacancies are becoming a substantially bigger problem in all sectors over time.

Figure 2 **Shortages increase most in services**



Note: the figure shows reported shortages aggregated to big industry groupings in 2010 and 2023, ranked in each case in 2023 order.

Sources: Business and Consumer Survey (top) and Eurostat job-vacancy rate (bottom).

The question then remains whether there are any clear patterns in these trends. Table A3 provides a more detailed description of each industry, showing the changes from 2012 to 2024, or nearest in each case, in the real wage, labour shortages and job vacancy rates, as well as the estimated relation between wages and different types of shortages. This shows large increases in labour shortages in most industries, as well as a level of variation in the relation between shortages and wages. There is a positive relation between wages and shortages in construction, accommodation and food services, and in financial and insurance services; but a negative relation in information and communications technology, professional and administrative services, and arts, entertainment and recreation.

4.1.2 The relation between shortages in a specific sector and average labour costs

This paper seeks to describe how labour shortages are associated with wages and also with job quality. Turning first to wages, to look at these associations across countries and sectors over time, the measures of labour shortages are regressed on average real wages within that country and sector controlling for the characteristics of that sector – the share of women, the share of young workers, the share of older workers, the share of workers in elementary occupations and the share in professional-managerial occupations. The analysis is conducted at the level of country and 1-digit industry, and the results are shown in Figure 3 below, with the coefficients showing the association between a 10% increase in real wages with labour shortages (in percentage points).

Overall, when accounting for country differences and common year differences (M1), there is a clear negative association, meaning that, when wages are 10% higher, the share of companies reporting labour shortages as a factor limiting their production is, on average, half a percentage point lower, while the job vacancy rate is 0.1 percentage points lower. By also controlling for differences inherent to the sector (M2), this association becomes somewhat stronger for labour as a limiting factor and remains similar for the job vacancy rate.

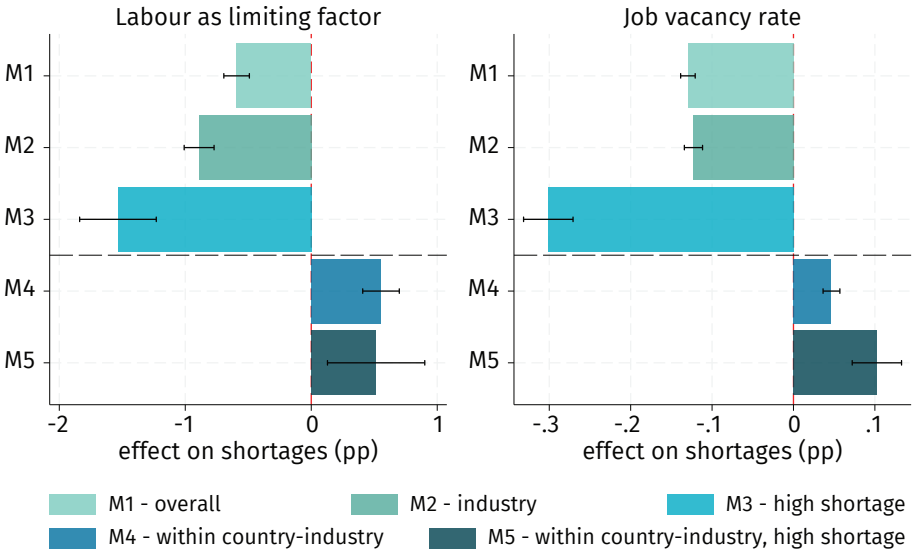
The next model (M3) then restricts this analysis to the country-sectors where more than a quarter of businesses reported labour as a limiting factor in 2023. This seeks to test whether this negative association between wages and shortages also holds among the most hard-hit sectors. Indeed, the relation is substantially stronger in this subgroup, with a 10% higher wage associated with, on average, a 1.5pp reduction in the share of companies reporting labour shortages as a problem and a 0.3pp reduction in the job vacancy rate. What this means in practice is that, within the group of industries where high levels of shortage were reported in 2023, there is a clear pattern that shortages are higher where wages are relatively lower.

These three models indicate that, when looking at countries and sectors, the places where shortages are worst also generally offer lower wages. This finding then strongly supports the Hypothesis 1 that wages, and probably job quality more widely, do play a role in how badly shortages grow.

The next step no longer compares different countries and sectors to each other but rather focuses on the variation within a specific sector and country; for instance, the construction industry in Germany. This is done by including fixed effects for country and industry (M4). This reverses the relation completely as a 10% higher wage within a country-sector is then associated with about a 0.5pp higher share of enterprises reporting labour shortages as an issue and a 0.04pp higher job vacancy rate compared to other years or quarters within that same country-industry. This analysis indicates that, over time, wages tend to increase as shortages rise.

Finally, this relation again holds among sectors that experienced high shortages in 2023 (M5). As this is a fixed effects model it is prone to reverse causality as well, and potentially captures the association going the other way, but it may also show that high shortages push firms to increase wages as much as possible (see e.g. Duval et al. 2022; Groiss and Sondermann 2023).

Figure 3 **Association of wages with shortages**



Note: the figure shows the estimated impact on labour shortages (in pp) of a 10% increase in real wages, controlling for the composition of sectors and fixed effects for country and year (M1); country, year and industry (M2); or the combination of country and industry as well as year (M4 and M5). Models 3 and 5 repeat M2 and M4 respectively while being restricted to industries that reported a high shortage in 2023 (defined as more than 25% of businesses reporting shortages).

Sources: Eurostat labour costs, combined with information on composition of country-sectors from Eurostat aggregate data and microdata; merged to: Business and Consumer Survey (top) and Eurostat job-vacancy rate (bottom).

4.2 Micro-analyses: association with wages

4.2.1 Wages and job mobility in response to labour shortages

The main question addressed in this paper concerns the extent to which the current climate of labour shortages affects wage growth through supporting

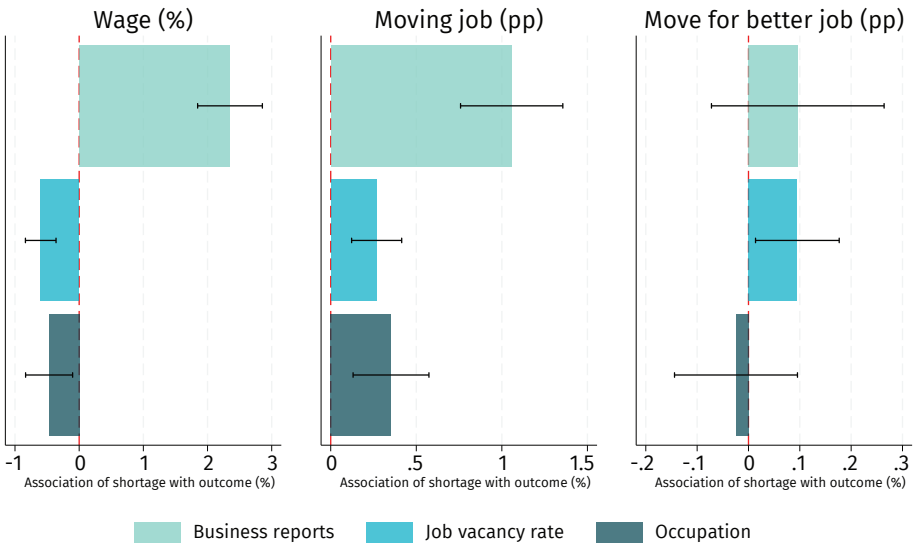
workers' bargaining position. Crucially though, the extent to which workers benefit from such a positive effect is likely to depend on the institutional context and the level of bargaining. This is analysed using cross-sectional microdata from the EU Statistics on Income and Living Conditions (EU-SILC) dataset from 2008 to 2022. The allows a look at how individual gross wages, accounting for working time and over the reference period (as in Zwysen 2024), vary with changing demand for labour. In order to account for changes in the demand for labour for otherwise similar workers, it is important to control for the major individual factors that can affect wages – sex, age, whether born in the EU or in a third country, highest obtained qualification (at most lower secondary, upper secondary or post-secondary non-tertiary. or tertiary), urbanity (dense, suburban or rural), hours worked, employment status (full-time employee, part-time employee, self-employed or other). The analysis includes fixed effects for industry, occupation, country and year of survey. These fixed effects capture common trends in wages and demand across each of these factors, but not their combination. The impact of labour shortages is thereby described as it varies over the categories of country, occupation, industry or year, while keeping the others constant.

Figure 4 shows (left-hand side) that workers in sectors where businesses report labour shortages as a bigger issue generally have higher hourly earnings than their peers where this is less the case. A 1 percentage point increase in reported labour shortages is associated with a 2.5% higher wage on average. There is, however, a small negative association of wages with working in a shortage occupation or a sector with many unfilled vacancies, where a 1pp higher job vacancy rate is associated with a 0.6% lower wage while working in a shortage occupation is associated with a 0.5% lower wage.

Second, workers who are currently in a job with greater shortages are substantially more likely to have moved in the last year (middle panel). An increase of 1pp in the reporting of labour shortages or in the job vacancy rate is associated with an increased probability of having moved in the last 12 months of 1.1pp and 0.3pp respectively. This is an increase of 13% and 4% respectively against the baseline of 8.3% of workers having moved in the past year.

The right-hand panel shows that this is generally because they looked for a better job as there is also a positive association (though not statistically significant at $p<0.05$ except for the vacancy rate) with having moved to a better job, as defined by respondents themselves. On average, 2.8% of workers have moved in the past 12 months to a better job. This probability is increased by around 0.1pp (or a 3.5% increase over the baseline) for a 1pp increase in the share of enterprises reporting shortages as an issue or in the job vacancy rate. This indicates that industries with greater shortages also attract more workers on average, probably because employers are looking for workers and seeking to be attractive. Full coefficients for this model are shown in tables A4, A5 and A6. As shown in Figure A1, wages indeed tend to be substantially, and statistically, significantly higher for those new movers who moved to shortage sectors or occupations than for those who moved to jobs less in demand. This is in line with studies showing businesses do respond by increasing their wages where possible (Morisette 2022; Groiss and Sondermann 2023).

Figure 4 **Association of labour shortages with wages and moving jobs**



Note: estimated association between labour shortage and individual outcomes, through weighted linear regression on demographic controls, with fixed effects for industry, occupation, country and year.

Source: EU-SILC plus contextual factors.

These findings support Hypothesis 2 concerning the link between wages and shortages: jobs that are relatively less attractive may experience greater shortages but, in the quest for employees, wages tend to increase somewhat. This is especially relevant for new hires. This is in line with studies looking at employers' reactions to labour shortages and their strategies to attract and retain workers (see e.g. Morisette 2022).

4.2.2 Variation by individuals' bargaining position

The previous subsection described the average associations. However, if labour shortages support workers' bargaining power, it is important to consider whether the association differs depending on workers' other sources of bargaining power. This subsection considers the key factor of individual characteristics.

First, the expectation is that labour shortages would serve to reduce the wage gaps between generally more vulnerable workers and less vulnerable ones as employers seek to attract all workers. This is in line with findings that socioeconomic inequalities reduce when labour markets are tight (see e.g. Zwysen 2016). The focus here is particularly on the differences between younger and older workers, women relative to men, migrants relative to non-migrants, the non-tertiary qualified relative to the university qualified, and those on temporary contracts rather than open-ended ones. The variation analysed in this model is primarily due to how contextual factors such as labour shortages differ in their wage effect by workers' characteristics.

Figure 5 shows how a change in labour shortages – either a 1pp increase in reported labour shortages or in the job vacancy rate, or being in a shortage occupation – affects the wage gap for each type of worker compared to others. First, and contrary to expectations, greater shortages tend to reduce the pay of non-university educated workers by between 1.5% and 2.5% for a 1pp increase in shortages, and by close to 4% for workers in shortage occupations.

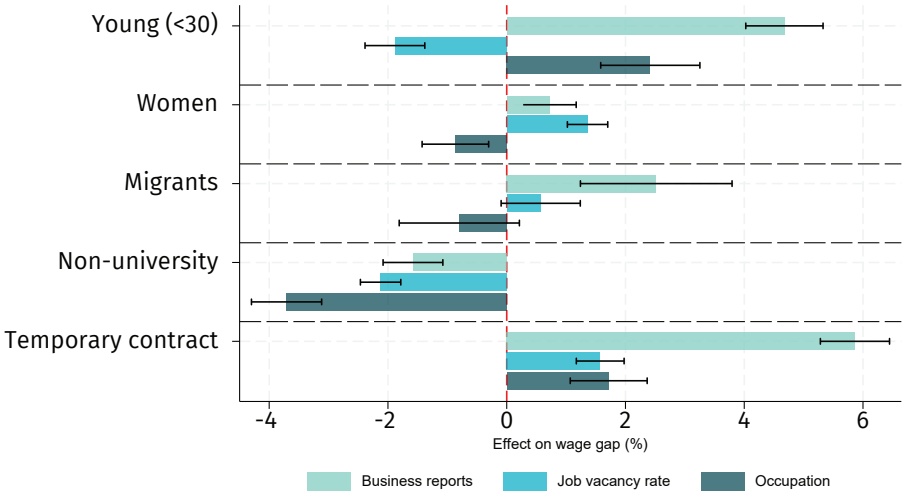
On the other hand, greater shortages are associated with substantially lower wage gaps between temporary workers and those on open-ended contracts. This indicates that inequality between workers declines somewhat along this dimension and could reflect an increase in options for these otherwise vulnerable workers. A 1pp increase in reported labour shortages is associated with an increase of close to 6% in the relative wage of temporary workers, and a 1pp increase in the job vacancy rate is associated with a close to 2% relative increase in the wage of temporary workers.

Regarding the other dimensions, there is some variation between types of shortage. However, an increase in the share of businesses reporting labour shortages is associated with an increase in the relative wage of younger to older workers by over 4%, an increase of women's relative wage by about 1%, and an increase of migrant's relative wage by over 2%, thereby reducing these wage gaps. In sectors and countries where shortages are seen as more problematic, the wages of more vulnerable workers do tend to increase as well, with the exception of wages for the lower-educated.

In sectors where the job vacancy rate is high, the gender pay gap and the migrant pay gap are also on average somewhat smaller, but younger workers tend to miss out even more relative to the majority. Finally, in shortage occupations young people earn relatively more, but women are at somewhat of a disadvantage.

Overall, then, this section indicates that, while labour shortages have some association with wages, this does not affect all workers similarly. While there is variation between measurements of shortages, there is some indication that more vulnerable workers in terms of sociodemographic background or being on temporary contracts may benefit relatively more from high demand for workers, and thereby see their wages increase relatively more. However, there is no such closing of the gap for lower-educated workers. This provides tentative support for Hypothesis 3, that wages increase relatively more for vulnerable workers.

Figure 5 **Individual factors affect the link between wages and shortages**



Note: estimated interaction term between demographic characteristics and labour shortages on real wage, from weighted linear regression on demographic controls with fixed effects for industry, occupation, country and year. The coefficient shows change in shortage effect if in a demographic group relative to the reference group.

Source: EU-SILC plus contextual factors.

4.2.3 Variation in the association with wages by worker representation

Differences are also expected to result from the institutional context. To analyse this, the association between labour shortages and wages is varied by indicators of the extent of worker representation at country-industry level – namely, union density – and the share of workers in an industry covered by collective pay agreements, either multi-employer or at company level. The variation used here is that between country-industry-year groups, with the outcome being individual level wages.

Figure 6 below shows, for each type of institutional worker power, how a 1pp increase in labour shortages, or being in a shortage occupation, affects wages for those in a country-sector-year with low institutional coverage (25^{th} percentile) and those where the institutional coverage is higher (75^{th} percentile). Crucially, worker representation is not measured here at company or individual level, but rather at aggregate industry level. It may therefore not be the case that any variation is driven by covered workers themselves, but might rather reflect other strategic choices made by non-covered employers. These figures should therefore only be taken as an indicator of how the association between labour shortages and real wages varies between sectors depending on institutional context.

The top left panel indicates that labour shortages as reported by businesses are associated with a higher wage, particularly in country-sector-years with low union density; while a high job vacancy rate is also associated with relatively lower wages in

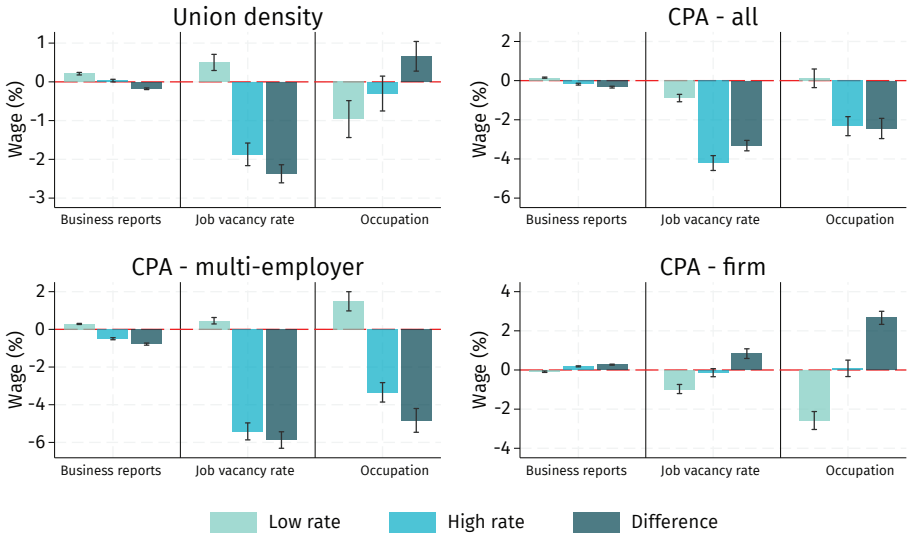
sectors with higher union density. This negative relation does not hold for shortage occupations, which do not have lower wages when union density is higher.

The top right panel shows that, for collective pay agreement coverage as well, there is a more negative association between wages and shortages in sectors with higher coverage, however measured. This relation is driven by workers in sectors covered by a high share of multi-employer or centralised collective pay agreements (bottom left); while for those in sectors with a high share of company agreements (bottom right) there is a stronger positive association.

This would be in line with wages adjusting less in the short term when workers are covered and there is a stronger collective bargaining process (Kölling 2022). There may also be greater adjustment in terms of non-wage indicators, which is addressed further in the next section. Additionally, it is clear that shortages also provide strong levers to unions when it comes to negotiating wages (Jalette 2023). It also supports the expectation that particularly those in more vulnerable positions with lower bargaining power – both due to sociodemographics or to a lack of representation – are positively affected by increased shortages.

A second crucial aspect is that wages tend to be higher for workers in sectors with stronger unions and higher collective bargaining coverage (Zwysen and Drahokoupil 2023). Under the impulse of labour shortages, the wages of non-covered workers catch up somewhat as employers attempt to attract more workers. This is in line with the Hypothesis 4 as workers with lower bargaining power benefit relatively more from shortages.

Figure 6 **How the wage association varies with institutional support**



Note: the figure shows the estimated impact of a 1pp increase in labour shortages measured by business reports or the job vacancy rate, or the effect of being in a shortage occupation, when the sectoral level of union density or collective pay agreement (CPA) coverage is at the 25th or 75th percentile, estimated from a regression with an interaction between the context and labour shortages, including demographic controls and fixed effects for industry, occupation, country and year.

Source: EU-SILC plus contextual variables.

4.3 Micro-analyses: association with wider job quality

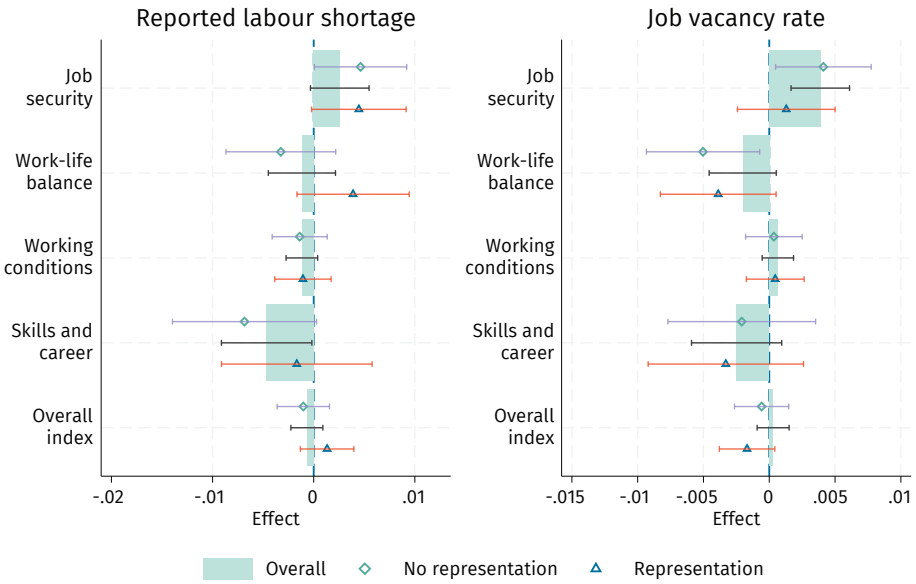
Finally, this section expands on the association between worker representation and job quality using detailed cross-national survey data from the 2021 EWCTS. This dataset has individual level information on job quality as well as on the presence of worker representatives within the company. As industry is measured at the more detailed 2-digit level, it also allows for more variation between specific industries. The main question addressed in this section is whether labour shortages are also associated with wider job quality beyond wages, while a second key question is whether company-level worker representation moderates this relation.

Figure 7 shows how reported labour shortages from business reports, and the job vacancy rate, are associated with job quality when accounting for country and industry differences, as well as controls for year, occupation and individual characteristics. Full coefficients for the composite index are shown in Table A7. This shows that job security is generally higher when labour shortages are higher, meaning workers have better contractual arrangements and are more secure in their employment. On the other hand, there a somewhat negative relation with work-life balance, and a clearly negative association with prospects for skills and career development. This goes against expectations, since more training and possibly also better career prospects for workers could be anticipated in shortage professions. There is no clear association with working conditions overall, which hides some heterogeneity as reported labour shortages are associated with higher work intensity ($p=0.06$) while job vacancy rates are associated with somewhat better physical work conditions ($p<0.05$).

Regarding the association with worker representation, as shown by the effect when there is no representation (purple diamond) or when there is (red triangle), there is some indication that labour shortages have less of a negative impact on job quality when the worker has some representation – particularly in terms of work-life balance and in skills and career development.

This is in line with expectations, as specified in hypothesis 5. Companies with workplace representation may indeed seek to attract workers more by non-wage benefits, as mentioned above. Second, workplace representation can act as a buttress for workers against the negative impacts.

Figure 7 **Estimated relation between labour shortages and job quality**



Note: estimated association between a 1 standard deviation change in reported labour shortages (left) or job vacancy rates (right) and four dimensions of job quality and the composite, both overall and separately by whether a trade union or worker representation is present in the workplace. Estimated from a regression with controls for age, gender, education, having a dependent child and firm size, as well as country, year, industry and occupation fixed effects.

Source: EWCS 2015 and EWCTS 2021.

5. Discussion and conclusions

This paper attempts to analyse how the currently high level of labour shortages might be expected to affect wages and the bargaining position of workers. Theoretically, greater competition for workers could be expected to increase worker power and, especially that the more disadvantaged, who have seen their bargaining position under threat over time, would benefit via better jobs and higher wages. We do indeed find some support for this as, across Europe, wages rise in response to rising shortages. There is, however, substantial variation in these patterns across industries and between workers.

There are some indications that shortages are associated with greater real wage growth. The paper shows that shortages are associated with better prospects regarding job contracts and job security, but somewhat worse training and career prospects and work-life balance. The paper further finds that worker representation can provide some shielding of workers against the more negative impacts of labour shortages on work-life balance or on training and career developments.

The paper further finds some indication that labour shortages can lead to the wages of more vulnerable workers – migrants, women, young workers and those on temporary contracts, as well as those in sectors with lower union density or collective agreement coverage – catching up. This can provide an extra source of bargaining power for those who otherwise lack it.

Here it is important to note that the focus is on short-term effects rather than the longer-term impacts of changes in bargaining power. In the long term, these shortages are also taken on board in collective agreements and associated with wage growth, limiting this short-term catch up.

While wider job quality is considered to some extent, the timing of the data means the paper could only consider the relation between shortages and wider job quality in 2015 and 2021 – in the middle of the Covid-19 pandemic and prior to the rapid rise in shortages that arose after it. One further limitation is that the paper makes use of aggregate information on labour shortages rather than firm-specific measures (see e.g. Groiss and Sondermann 2023). This would be important in distinguishing successful approaches to attract workers in the more difficult context provided by labour shortages. Finally, it is important to highlight the heterogeneity of labour shortages – this one concept covers a variety of issues including skills mismatch, a lack of skills and relatively poor working conditions. This paper describes averages but, in some specific sectors, the situation may be

rather different especially with regard to a shortage of workers with specific skills, for instance.

These limitations notwithstanding, this paper provides a descriptive overview of trends across the EU, which has experienced widespread growth in labour shortages. It also provides some insight into how different forms of bargaining power – through collective bargaining and trade unions on the one hand, and through individual forms and labour demand on the other – interact with each other. Moreover, it supports the idea that labour shortages provide opportunities for workers, but may also provide dangers if, in the short run, individual bargaining at times of shortages results in high pay rises (Jalette 2023). What is crucial here is a consideration of the long run and of the reasons for the incidence of shortages in the first place.

References

Aeppli C. and Wilmers N. (2022) Rapid wage growth at the bottom has offset rising US inequality, Proceedings of the National Academy of Sciences, 119 (42), e2204305119. https://doi.org/10.1073/pnas.2204305119

Araki S. et al. (2022) Monopsony and concentration in the labour market, in OECD (ed.) OECD Employment Outlook 2022, OECD Publishing. https://doi.org/10.1787/0ecab874-en

Bassanini A. et al. (2024) Labor market concentration, wages and job security in Europe, Journal of Human Resources. https://doi.org/10.3368/jhr.0223-12757R1

Berlingieri G., Blanchenay P. and Criscuolo C. (2017) The great divergence(s), OECD Science, Technology and Industry Policy Papers 39, OECD Publishing. https://doi.org/10.1787/953f3853-en

Blanchet T., Chancel L. and Gethin A. (2022) Why is Europe more equal than the United States?, American Economic Journal: Applied Economics, 14 (4), 480–518. https://doi.org/10.1257/app.20200703

Brandolini A., Rosolia A. and Torrini A. (2010) The distribution of employees' labour earnings in the European Union: data, concepts and first results, in Atkinson A.B. and Marlier E. (eds.) Income and living conditions in Europe, Publications Office of the European Union, 265-287.

Card D. et al. (2017) Firms and labor market inequality: evidence and some theory, Journal of Labor Economics, 36 (S1), S13–S70. https://doi.org/10.1086/694153

Cardoso A.R., Guimarães P. and Portugal P. (2016) What drives the gender wage gap? A look at the role of firm and job-title heterogeneity, Oxford Economic Papers, 68 (2), 506–524. https://doi.org/10.1093/oep/gpv069

Causa O. et al. (2022) The post-Covid-19 rise in labour shortages, OECD Economics Department Working Papers 1721, OECD Publishing. https://doi.org/10.1787/e60c2d1c-en

Cedefop (2022) An ally in the green transition: VET, especially apprenticeship, can provide the skills needed for greening jobs – and in turn help shape them, Publications Office of the European Union. https://data.europa.eu/doi/10.2801/712651

Criscuolo C. et al. (2020) Workforce composition, productivity and pay: the role of firms in wage inequality, IZA Discussion Paper Series 13212, Institute of Labor Economics.

Denk O. et al. (2019) The role of collective bargaining systems for labour market performance, in OECD (ed.) Negotiating our way up: collective bargaining in a changing world of work, OECD Publishing, 105-142. https://doi.org/10.1787/068bb29d-en

Duval R. et al. (2022) Labor market tightness in advanced economies, Staff Discussion Notes 2022/001, IMF. https://www.imf.org/en/Publications/Staff-Discussion-Notes/Issues/2022/03/30/Labor-Market-Tightness-in-Advanced-Economies-515270

Eurofound (2021) Tackling labour shortages in EU member states, Publications Office of the European Union.

Eurofound (2023) Measures to tackle labour shortages: lessons for future policy, Publications Office of the European Union.

European Commission (2022) European Business Cycle Indicators: a closer look at labour shortages across the EU. 3rd Quarter 2022, Technical Paper 59, Publications Office of the European Union.

European Commission (2023) Employment and social developments in Europe 2023, Publications Office of the European Union.
European Labour Authority (2023) EURES report on labour shortages and surpluses 2022, Publications Office of the European Union.
Ferguson S. and Hoover M. (2024) Understanding America's labor shortage: the most impacted industries, US Chamber of Commerce, 13.05.2024. https://www.uschamber.com/workforce/understanding-americas-labor-shortage-the-most-impacted-industries
Garnero A. (2021) The impact of collective bargaining on employment and wage inequality: evidence from a new taxonomy of bargaining systems, European Journal of Industrial Relations, 27 (2), 185–202. https://doi.org/10.1177/0959680120920771
Green A.E. et al. (2020) Employer decision-making around skill shortages, employee shortages and migration: literature review, Migration Advisory Committee.
Groiss M. and Sondermann D. (2023) Help wanted: the drivers and implications of labour shortages, ECB Working Paper 2023/2863. https://doi.org/10.2139/ssrn.4623034
Jalette P. (2023) Labour shortages: a game changer for industrial relations?, Labour and Industry, 34 (1), 11-25. https://doi.org/10.1080/10301763.2023.2230953
Kiss Á. et al. (2022) Slack and tightness, making sense of post Covid-19 labour market developments in the EU, Publications Office of the European Union. https://data.europa.eu/doi/10.2765/166401
Kölling A. (2022) Shortage of skilled labor, unions and the wage premium: a regression analysis with establishment panel data for Germany, Journal of Labor Research, 43 (2), 239–259. https://doi.org/10.1007/s12122-022-09334-1
Le Barbanchon T., Ronchi M. and Sauvagnat J. (2023) Hiring difficulties and firms' growth. https://papers.ssrn.com/abstract=4105264
Lombardi M.J., Riggi M. and Viviano E. (2023) Workers' bargaining power and the Phillips Curve: a micro–macro analysis, Journal of the European Economic Association, 21 (5), 1905–1943. https://doi.org/10.1093/jeea/jvad016
Marinescu I., Ouss I. and Pape L.-D. (2021) Wages, hires, and labor market concentration, Journal of Economic Behavior & Organization, 184, 506–605. https://doi.org/10.1016/j.jebo.2021.01.033
McGrath J. (2021) Report on labour shortages and surpluses, European Labor Authority.
Morisette T. (2022) Employer responses to labour shortages, Statistics Canada. https://www150.statcan.gc.ca/n1/pub/36-28-0001/2022007/article/00001-eng.htm
Mortensen D.T. (2003) Wage dispersion: why are similar workers paid differently?, The MIT Press. https://doi.org/10.7551/mitpress/7147.001.0001
Moscarini G. and Postel-Vinay F. (2018) The cyclical job ladder, Annual Review of Economics, 10 (1), 165–188. https://doi.org/10.1146/annurev-economics-080217-053425
Muñoz de Bustillo R. (2011) Measuring more than money: the social economics of job quality, Edward Elgar.
OECD (2024) OECD employment outlook 2024: the net-zero transition and the labour market, OECD Publishing. https://doi.org/10.1787/ac8b3538-en
Okun A., Greenspan A. and Fellner W. (1973) Upward mobility in a high-pressure economy, Brookings Papers on Economic Activity 1, Brookings Institute.
Paternesi Meloni W. and Stirati A. (2022) The decoupling between labour compensation and productivity in high-income countries: why is the nexus broken?, British Journal of Industrial Relations, 61 (2), 425–463. https://doi.org/10.1111/bjir.12713

Piasna A. (2023) Job quality in turbulent times: an update of the European Job Quality Index, Working Paper 2023.05, ETUI.

Schippers J.J. (2023) What is driving current labour market shortages and how older workers could help, The Conversation, 03.03.2023. https://theconversation.com/what-is-driving-current-labour-market-shortages-and-how-older-workers-could-help-200873

Schweitzer J. and Khattar R. (2021) It's a good jobs shortage: the real reason so many workers are quitting, American Progress, 07.12.2021. https://www.americanprogress.org/article/its-a-good-jobs-shortage-the-real-reason-so-many-workers-are-quitting/

Song J. et al. (2019) Firming up inequality, The Quarterly Journal of Economics, 134 (1), 1–50. https://doi.org/10.1093/qje/qjy025

Ståhl C.-M. (2022) Labour shortages offer trade unions valuable opportunity, Social Europe,11.07. 2022. https://www.socialeurope.eu/labour-shortages-offer-trade-unions-valuable-opportunity

Tomaskovic-Devey D. et al. (2020) Rising between-workplace inequalities in high-income countries, Proceedings of the National Academy of Sciences of the United States of America, 117 (17), 9277–9283. https://doi.org/10.1073/pnas.1918249117

Vandeplas A. et al. (2022) The possible implications of the green transition for the EU labour market, European Economy Discussion Paper 176, Publications Office of the European Union.

Visser J. (2019) ICTWSS Database - version 6.1, Amsterdam, Amsterdam Institute for Advanced Labour Studies, University of Amsterdam.
https:// www.ictwss.org/downloads

Vona F. (2021) Labour markets and the green transition: a practitioner's guide to the task-based approach, Publications Office of the European Union.
https://data.europa.eu/doi/10.2760/65924

Weber T. and Adăscăliței D. (2023) Why labour can be in short supply, Social Europe, 12.09.2023.
https://www.socialeurope.eu/why-labour-can-be-in-short-supply

West D.M. (2013) The paradox of worker shortages at a time of high national unemployment, Brookings institute, 10.04.2013. https://www.brookings.edu/articles/the-paradox-of-worker-shortages-at-a-time-of-high-national-unemployment/

Zwysen W. (2016) Crowding out of disadvantaged young adults in Germany: background matters depending on local labour market, European Sociological Review, 32 (5), 662–674. https://doi.org/10.1093/esr/jcw023

Zwysen W. (2021) Performance pay across Europe: drivers of the increase and the link with wage inequality, Working Paper 2021.06, ETUI. https://doi.org/10.2139/ssrn.3884809

Zwysen W. (2022) Global and institutional drivers of wage inequality between and within firms, Socio-Economic Review, 21 (4), 2043–2068. https://doi.org/10.1093/ser/mwac054

Zwysen W. (2023) Labour shortages: turning away from bad jobs, Policy Brief 2023.03, ETUI.

Zwysen W. (2024) Wage inequality in Europe: institutional and economic factors supporting workers, Working Paper 2024.05, ETUI.

Zwysen W., Di Stasio V. and Heath A. (2021) Ethnic penalties and hiring discrimination: comparing results from observational studies with field experiments in the UK, Sociology, 55 (2), 263–282. https://doi.org/10.1177/0038038520966947

Zwysen W. and Akgüç M. (2023) Analysing the flows and labour market outcomes of short-term mobile workers in the EU, Working Paper 2023.07, ETUI.

Zwysen W. and Drahokoupil J. (2023) Collective bargaining and power: wage premium of collective agreements in Europe 2002–2018, British Journal of Industrial Relations, 62 (2), 335–357. https://doi.org/10.1111/bjir.12777

Zwysen W. et al. (2021) Labour market and social developments: crisis further entrenches inequality, in ETUI and ETUC (eds.) Benchmarking Working Europe 2021, ETUI, 45-82.

Zwysen W. et al. (2024) Labour market and social developments in the EU: the quest for strong jobs recovery, in Piasna A. and Theodoropoulou S. (eds.) Benchmarking Working Europe 2024, ETUI and ETUC, 51-86.

All links were checked on 28.08.2024.

Appendix

Table A1 **Description of sample for micro-analyses**

	Labour as limiting factor		Job vacancy rate		Occupational codes	
Labour as limiting factor	**Observations**	**Average**	**Observations**	**Average**	**Observations**	**Average**
Log wages	846,407	2.22	809,447	2.23	1,854,430	2.26
Changed job	699,722	0.08	662,336	0.08	1,431,084	0.08
Changed job for better	846,407	0.03	809,447	0.03	1,854,430	0.03
Labour as limiting factor	846,407	13.74	735,714	15.16	678,338	14.84
Job vacancy rate	735,714	1.59	809,447	1.59	685,986	1.63
Shortage occupation	678,338	0.41	685,986	0.39	1,854,430	0.43
Dummy: female	846,407	0.38	809,447	0.39	1,854,430	0.48
Age	846,407	41.00	809,447	41.13	1,854,430	41.60
Migrant: EU	846,407	0.03	809,447	0.03	1,854,430	0.04
Migrant: third country	846,407	0.07	809,447	0.07	1,854,430	0.07
Education: low	846,407	0.18	809,447	0.16	1,854,430	0.16
Education: high	846,407	0.32	809,447	0.35	1,854,430	0.37
Urban: dense	846,407	0.45	809,447	0.45	1,854,430	0.45
Urban: rural	846,407	0.25	809,447	0.26	1,854,430	0.26
Hours worked	846,407	39.33	809,447	39.26	1,854,430	38.22
Part-time	846,407	0.11	809,447	0.11	1,854,430	0.15
Self-employed	846,407	0.00	809,447	0.00	1,854,430	0.00
Other	846,407	0.00	809,447	0.00	1,854,430	0.00
AT	846,407	0.02	809,447	0.03	1,854,430	0.02
BE	846,407	0.03	809,447	0.03	1,854,430	0.03
BG	846,407	0.02	809,447	0.02	1,854,430	0.02
CY	846,407	0.00	809,447	0.00	1,854,430	0.00
CZ	846,407	0.04	809,447	0.04	1,854,430	0.03
DE	846,407	0.13	809,447	0.13	1,854,430	0.12
DK	846,407	0.01	809,447	0.01	1,854,430	0.01
EE	846,407	0.00	809,447	0.01	1,854,430	0.00
EL	846,407	0.02	809,447	0.02	1,854,430	0.02
ES	846,407	0.10	809,447	0.11	1,854,430	0.10
FI	846,407	0.01	809,447	0.01	1,854,430	0.01
FR	846,407	0.14	809,447	0.13	1,854,430	0.15
HR	846,407	0.01	809,447	0.01	1,854,430	0.01
HU	846,407	0.03	809,447	0.03	1,854,430	0.02
IE	846,407	0.01	809,447	0.01	1,854,430	0.01
IT	846,407	0.14	809,447	0.08	1,854,430	0.12
LT	846,407	0.01	809,447	0.01	1,854,430	0.01
LU	846,407	0.00	809,447	0.00	1,854,430	0.00
LV	846,407	0.00	809,447	0.01	1,854,430	0.01
MT	846,407	0.00	809,447	0.00	1,854,430	0.00

Labour as limiting factor	Labour as limiting factor		Job vacancy rate		Occupational codes	
	Observations	Average	Observations	Average	Observations	Average
PL	846,407	0.09	809,447	0.10	1,854,430	0.08
PT	846,407	0.02	809,447	0.03	1,854,430	0.03
RO	846,407	0.05	809,447	0.05	1,854,430	0.04
RS	846,407	0.01	809,447	0.00	1,854,430	0.01
SE	846,407	0.02	809,447	0.02	1,854,430	0.02
SK	846,407	0.02	809,447	0.02	1,854,430	0.01
UK	846,407	0.08	809,447	0.10	1,854,430	0.10

Source: EU-SILC 2008-2022 (2011 for occupational codes).

Table A2 **Describing the sample from the European Working Conditions Survey**

	2015		2021	
	Average	Standard deviation	Average	Standard deviation
Job quality: work-life balance	0.62	0.26	0.76	0.26
Job quality: career	0.39	0.32	0.63	0.33
Job quality: working conditions	0.40	0.14	0.56	0.11
Job quality: representation	0.47	0.30	0.56	0.36
Job quality: secure	0.84	0.22	0.87	0.21
Job Quality Index	0.56	0.13	0.71	0.12
Representation	0.42	0.49	0.50	0.50
Female	0.41	0.49	0.39	0.49
Age	42.21	11.93	41.07	11.82
Dependent child	0.45	0.50	0.38	0.48
Education: low	0.19	0.39	0.08	0.27
Education: intermediate	0.63	0.48	0.48	0.50
Education: high	0.18	0.39	0.44	0.50
Firm size: single	0.03	0.18	0.03	0.17
Firm size: 2-9	0.27	0.45	0.21	0.41
Firm size: 10-49	0.11	0.31	0.31	0.46
Firm size: 50-249	0.41	0.49	0.23	0.42
Firm size: 250+	0.17	0.37	0.22	0.41
Reported labour shortage	10.85	12.95	18.95	16.36
Job vacancy rate	1.55	1.28	2.83	3.25
N	**12,579**		**11,588**	

Source: EWCS 2015 and EWCTS 2021.

Table A3 **Detailed description of industry patterns**

Industry	Real wage relative to country average	Labour as limitation on production	Job vacancy rate	N_ regression	Limitation on wage	JVR on wage
Manufacturing	-1.57	21.73	1.98	19266	0 (0.01)	-1.23 (0.18)***
Construction	-10.39	32.32	3.12	3040	0.07 (0.02)***	-0.49 (0.12)***
Transportation and storage	-3.34	20.59	2.19	3819	0 (0.01)	0.11 (0.22)
Accommodation and food service activities	-30.73	24.29	3.68	1876	0.06 (0.02)***	0.59 (0.17)***
Information and communications	50.94	17.47	2.81	3489	-0.03 (0.02)**	-2.98 (0.3)***
Financial and insurance activities	63.95	11.83	1.69	1517	0.04 (0.01)***	-1.65 (0.24)***
Professional, scientific and technical activities	38.16	22.47	2.72	2403	-0.06 (0.01)***	-2 (0.23)***
Administrative and support service activities	-22.62	28.26	3.93	5214	0.01 (0.01)	0.03 (0.07)
Arts, entertainment and recreation	7.81	15.69	1.69	1844	-0.05 (0.02)**	-1.22 (0.32)***
Other service activities	-10.18	19.80	2.49	204	0.02 (0.01)	1.07 (0.28)***

Note: shows the change in real wage, reported labour shortages and job vacancy rates by industry from 2012 to 2024 (or nearest). Regressions show estimated relation between log wage and reported labour shortage or job vacancy rate controlling for country fixed effects, year fixed effects and more detailed industry fixed effects. *: p<0.1, **: p<0.05, ***: p<0.01

Source: Eurostat labour costs; merged to: Business and Consumer Survey and Eurostat job-vacancy rate.

Table A4 **Coefficients of micro model on log real wages**

Log real wage	Reported labour shortage	JVR	Occupation
Reported labour shortages	0.00121***		
	(0.000131)		
Job vacancy rate		-0.00438***	
		(0.000893)	
Shortage occupation			-0.00470**
			(0.00188)
Women	-0.153***	-0.150***	-0.132***
	(0.00216)	(0.00228)	(0.00157)
Age	0.0107***	0.0107***	0.0106***
	(9.66e-05)	(0.000101)	(6.62e-05)
Born in EU	-0.0615***	-0.0514***	-0.0584***
	(0.00667)	(0.00689)	(0.00432)
Born in third country	-0.117***	-0.110***	-0.117***
	(0.00495)	(0.00545)	(0.00337)
Low education	-0.124***	-0.124***	-0.140***
	(0.00306)	(0.00339)	(0.00229)
High education	0.240***	0.238***	0.217***
	(0.00273)	(0.00284)	(0.00182)
Urban: dense	0.0432***	0.0445***	0.0426***
	(0.00236)	(0.00254)	(0.00162)
Urban: rural	-0.0453***	-0.0411***	-0.0310***
	(0.00241)	(0.00257)	(0.00170)
Hours worked	0.0151***	0.0165***	0.0156***
	(0.000220)	(0.000233)	(0.000145)
Part-time	0.0908***	0.111***	0.116***
	(0.00523)	(0.00550)	(0.00315)
Self-employed	-0.0638***	-0.0340***	0.00650
	(0.00923)	(0.00966)	(0.00613)
Other	0.0732	0.427*	0.405***
	(0.108)	(0.249)	(0.0680)
Constant	1.184***	1.148***	1.220***
	(0.0105)	(0.0110)	(0.00691)
Occupation fixed effects	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes
Observations	907,129	868,984	1,995,033
R-squared	0.644	0.655	0.633

Note: coefficients from estimated model on EU-SILC microdata, with coefficient (standard error) and significance. *: p<0.1, **: p<0.05, ***: p<0.01

Source: EU-SILC plus contextual factors.

Table A5 **Coefficients of micro model on probability of having moved jobs**

Change job	Reported labour shortage	JVR	Occupation
Reported labour shortages	0.000549***		
	(7.88e-05)		
Job vacancy rate		0.00195***	
		(0.000543)	
Shortage occupation			0.00351***
			(0.00113)
Women	-0.00316**	-0.00363***	-0.00297***
	(0.00124)	(0.00133)	(0.000898)
Age	-0.00349***	-0.00358***	-0.00344***
	(5.37e-05)	(5.76e-05)	(3.84e-05)
Born in EU	0.0105**	0.0112***	0.0135***
	(0.00409)	(0.00430)	(0.00267)
Born in third country	0.00917***	0.0111***	0.00670***
	(0.00262)	(0.00291)	(0.00181)
Low education	0.00101	0.00118	0.000934
	(0.00155)	(0.00176)	(0.00115)
High education	0.00638***	0.00571***	0.00570***
	(0.00157)	(0.00165)	(0.00109)
Urban: dense	0.00434***	0.00500***	0.00501***
	(0.00129)	(0.00143)	(0.000926)
Urban: rural	0.00182	0.00250*	0.00145
	(0.00135)	(0.00146)	(0.000953)
Hours worked	0.000268***	0.000128	-8.31e-06
	(9.74e-05)	(0.000105)	(6.61e-05)
Part-time	0.0259***	0.0227***	0.0196***
	(0.00263)	(0.00281)	(0.00164)
Self-employed	0.0803***	0.0780***	0.0613***
	(0.00425)	(0.00454)	(0.00273)
Other	-0.0155	-0.0170	0.0362
	(0.0455)	(0.0461)	(0.0389)
Constant	0.200***	0.215***	0.215***
	(0.00496)	(0.00534)	(0.00340)
Occupation fixed effects	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes
Observations	728,102	689,472	1,496,002
R-squared	0.032	0.035	0.039

Note: coefficients from estimated model on EU-SILC microdata, with coefficient (standard error) and significance. *: p<0.1, **: p<0.05, ***: p<0.01

Source: EU-SILC plus contextual factors.

Table A6 **Coefficients of micro model on probability of having moved to better job**

Changed to better job	Reported labour shortage	JVR	Occupation
Reported labour shortages	5.01e-05		
	(4.48e-05)		
Job vacancy rate		0.000694**	
		(0.000303)	
Shortage occupation			-0.000244
			(0.000611)
Women	-0.00135*	-0.00169**	-0.00172***
	(0.000715)	(0.000777)	(0.000497)
Age	-0.00163***	-0.00170***	-0.00146***
	(3.10e-05)	(3.34e-05)	(2.09e-05)
Born in EU	0.00746***	0.00910***	0.00722***
	(0.00243)	(0.00267)	(0.00153)
Born in third country	0.00248*	0.00357**	0.00172*
	(0.00140)	(0.00158)	(0.000931)
Low education	0.000963	0.00129	-0.000560
	(0.000846)	(0.000967)	(0.000603)
High education	0.00508***	0.00492***	0.00382***
	(0.000943)	(0.000989)	(0.000601)
Urban: dense	0.00151**	0.00166**	0.00177***
	(0.000756)	(0.000836)	(0.000515)
Urban: rural	0.00172**	0.00153*	0.000476
	(0.000798)	(0.000853)	(0.000525)
Hours worked	0.000479***	0.000431***	0.000292***
	(5.46e-05)	(5.82e-05)	(3.47e-05)
Part-time	0.00535***	0.00466***	0.00216**
	(0.00141)	(0.00150)	(0.000841)
Self-employed	0.0306***	0.0321***	0.0208***
	(0.00242)	(0.00264)	(0.00142)
Other	-0.0220***	-0.0265***	-0.0115
	(0.00303)	(0.00826)	(0.0132)
Constant	0.0765***	0.0823***	0.0771***
	(0.00280)	(0.00299)	(0.00180)
Occupation fixed effects	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes
Observations	907,129	868,984	1,995,033
R-squared	0.022	0.024	0.026

Note: coefficients from estimated model on EU-SILC microdata, with coefficient (standard error) and significance. *: p<0.1, **: p<0.05, ***: p<0.01

Source: EU-SILC plus contextual factors.

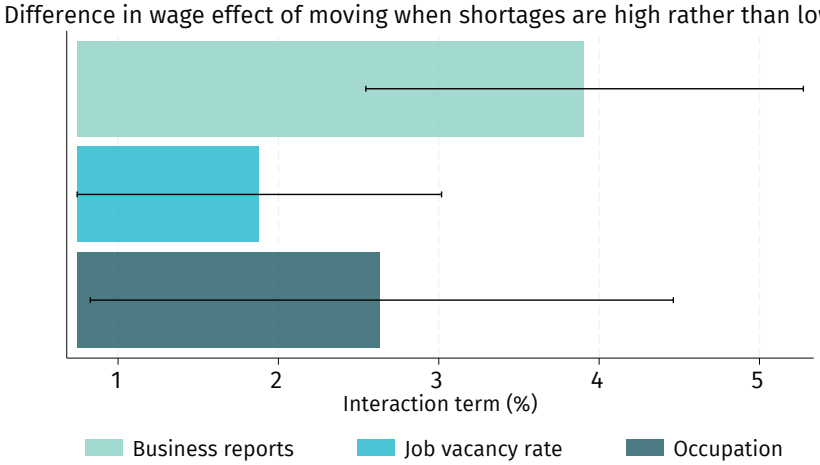
Table A7 **Coefficients of regression on Job Quality Index**

Job quality – composite	Reported labour shortages M1	Reported labour shortages M2	Job vacancy rates M1	Job vacancy rates M2
Worker representation		0.0284***		0.0329***
		(0.00233)		(0.00213)
Reported labour shortage	-4.50e-05	-6.86e-05		
	(5.39e-05)	(8.81e-05)		
Representation * labour shortage		0.000157		
		(0.000101)		
Job vacancy rate			0.000141	-0.000279
			(0.000298)	(0.000506)
Representation * Job vacancy rate				-0.000532
				(0.000599)
Women	0.00164	0.00357**	0.00227*	0.00386**
	(0.00137)	(0.00181)	(0.00129)	(0.00171)
Low education	0.00929***	0.00805***	0.00911***	0.00690***
	(0.00197)	(0.00246)	(0.00195)	(0.00244)
High education	0.0149***	0.0125***	0.0137***	0.00910***
	(0.00234)	(0.00304)	(0.00228)	(0.00295)
Age	0.000226	-7.10e-05	0.000344	0.000224
	(0.000324)	(0.000453)	(0.000310)	(0.000432)
Age squared	-9.69e-06***	-5.12e-06	-1.09e-05***	-8.89e-06*
	(3.76e-06)	(5.31e-06)	(3.59e-06)	(5.06e-06)
Dependent child	0.00382***	0.00592***	0.00421***	0.00572***
	(0.00126)	(0.00165)	(0.00120)	(0.00157)
Firm size: 2-9	0.0191***	0.0177***	0.0182***	0.0146***
	(0.00220)	(0.00473)	(0.00209)	(0.00445)
Firm size: 10-49	0.0355***	0.0275***	0.0336***	0.0234***
	(0.00231)	(0.00482)	(0.00219)	(0.00453)
Firm size: 50-249	0.0355***	0.0233***	0.0338***	0.0190***
	(0.00226)	(0.00473)	(0.00215)	(0.00445)
Firm size: 250+	0.0421***	0.0228***	0.0412***	0.0202***
	(0.00249)	(0.00497)	(0.00235)	(0.00468)
Constant	0.622***	0.601***	0.623***	0.603***
	(0.00696)	(0.0102)	(0.00667)	(0.00972)
Occupation (2-digit)	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes
Country	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
Observations	44,534	24,167	48,898	26,531
R-squared	0.318	0.391	0.309	0.380

Note: standard errors in parentheses. * p<0.1, ** p<0.05, *** p<0.01

Source: EWCS plus contextual factors.

Figure A1 **Moving to shortage job is more associated with higher wages than other moves**



Note: estimated interaction term between moving for a better job and labour shortages on real wage, from weighted linear regression on demographic controls, fixed effects for industry, occupation, country and year. The coefficient shows how association of moving changes if shortages move from low (25th) to high (75th).

Source: EU-SILC plus contextual factors.

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