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Abstract/Résumé

The post-COVID-19 rise in labour shortages

The labour market recovery from the COVID-19 pandemic has been strong among advanced countries, partly reflecting massive and unprecedented policy support to workers and firms. This paper provides evidence and stylised facts about labour market tightening and labour shortages since the onset of the pandemic. Labour shortages have been widespread across countries, yet particularly in Australia, Canada and the United States; and across industries, yet particularly in contact-intensive ones like accommodation and food, but also manufacturing. This picture is to a good extent driven by cyclical factors: in tight labour markets, workers are more likely to switch for better job opportunities. But this paper argues, based on illustrative evidence, that other factors beyond the economic cycle may also play a role: the post-COVID-19 increase in labour shortages may partly reflect structural changes, in particular changes in preferences, as some workers may no longer accept low-pay and poor or strenuous working conditions.

JEL classification: E24, E32, J11, J22, J23, J31, J63
Keywords: Labour shortages, labour market recovery, great resignation, policy analysis

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Les pénuries de main d'œuvre suite à la crise de la COVID-19

Le reprise du marché du travail suite à la crise de la COVID-19 a été vigoureuse dans les pays avancés, favorisée par un effort public sans précédent en matière de soutien aux travailleurs et aux entreprises, et par un net rebond de la demande. Cet article fournit une analyse comparative des pénuries de main-d'œuvre observées depuis le début de la pandémie. Ces pénuries ont été relativement généralisées entre pays, mais particulièrement prononcées en Australie, au Canada et aux États-Unis; elles ont été aussi relativement généralisées entre secteurs, mais particulièrement prononcées dans les secteurs d'hébergement et restauration ainsi que dans l'industrie manufacturière. Cette situation est certes en bonne partie expliquée par des facteurs cycliques: quand le marché du travail est tendu, les travailleurs ont davantage tendance à changer d'emploi pour profiter de meilleurs opportunités. Cependant, cet article suggère, données illustratives à l'appui, que d'autres facteurs, eux plus structurels, pourraient jouer un rôle: ces difficultés de recrutement post-pandémie seraient en partie liées à un changement au niveau des préférences, dans le sens ou' un certain nombre de travailleurs n'accepteraient plus des emplois peu rémunérés et plus généralement des conditions de travail précaires, difficiles ou pénibles.

Classification JEL: E24, E32, J11, J22, J23, J31, J63
Keywords:. Pénuries de main-d'œuvre, reprise de marché du travail, grande démission, analyse des politiques

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The post-COVID-19 rise in labour shortages

By Orsetta Causa, Michael Abendschein, Nhung Luu, Emilia Soldani and Chiara Soriolo[1]

Introduction

1. The labour market recovery from the COVID-19 pandemic has been strong in the OECD area, even if uneven across countries and groups of workers (OECD, 2022[1]). This progress is now threatened by the war in Ukraine, which has prompted unprecedented sanctions against Russia by a multitude of countries from around the globe (OECD, 2022[2]). By and large, the strong labour market recovery in the advanced economies (Figure 1) reflects massive and unprecedented policy support to workers and firms ((OECD, 2021[3]), ((OECD, 2022[1])[2])). For instance, the stability of the employment rate over the crisis period in Europe and Japan reflects widespread reliance on job retention schemes. This is in contrast with Canada and the United States, where workers received generous cash support and employment bounced back above or close to pre-pandemic levels following a sharp drop in the early phase of the pandemic (Figure 1).

2. Many countries have been facing labour shortages since the early stages of the recovery, in a context of broader supply bottlenecks that have been challenging the capacity of firms to meet demand needs on a global scale (OECD, 2021[4]). For example, business surveys show that an increasing share of firms have been reporting production constraints from labour shortages; more than a quarter of EU firms in the first quarter of 2022, both in services and industry (Business and consumer surveys, EC).

[1] The authors work in the OECD Economics Department. The authors thank Åsa Johansson and Douglas Sutherland for fruitful discussions and valuable suggestions. They are also grateful to colleagues from the Economics Department Luiz de Mello, Michael Koelle, Sébastien Turban and Boris Cournède as well as Andrea Salvatori from the Directorate for Employment, Labour and Social Affairs and Donal Smith from the Trade and Agriculture Directorate for their valuable discussions, comments and insights that greatly benefitted the quality of the paper. They thank Dacil Kurzweg for her great help with the final preparation of the manuscript and delegates of the OECD Economic Policy Committee for their excellent discussion of the paper.

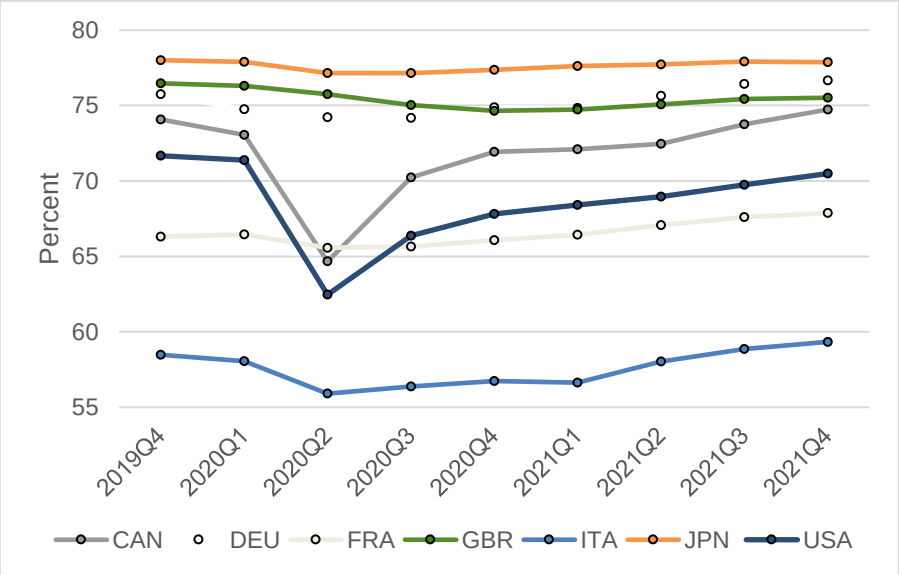
[2] See Chapter 2 in (OECD, 2022[1]) for a comprehensive analysis of COVID-19-related policy interventions to support incomes and workers.

3. This paper provides evidence and stylised facts about labour shortages across advanced OECD countries since the onset of the COVID-19 crisis.[3,4] Emphasis is placed on developments across countries, industries and occupations based on the collection, compilation and harmonisation of country-specific official and timely data sources (Box 1). Key stylised facts about rising labour shortages are followed by a discussion of possible explanations and corresponding policy implications, with a focus on one policy-relevant explanation, that is, a "great resignation" from low-quality jobs.

Figure 1 Labour markets in advanced economies have rebounded strongly from the pandemic

Employment and unemployment rates, 2019Q4-2021Q4, OECD Total and G7 countries

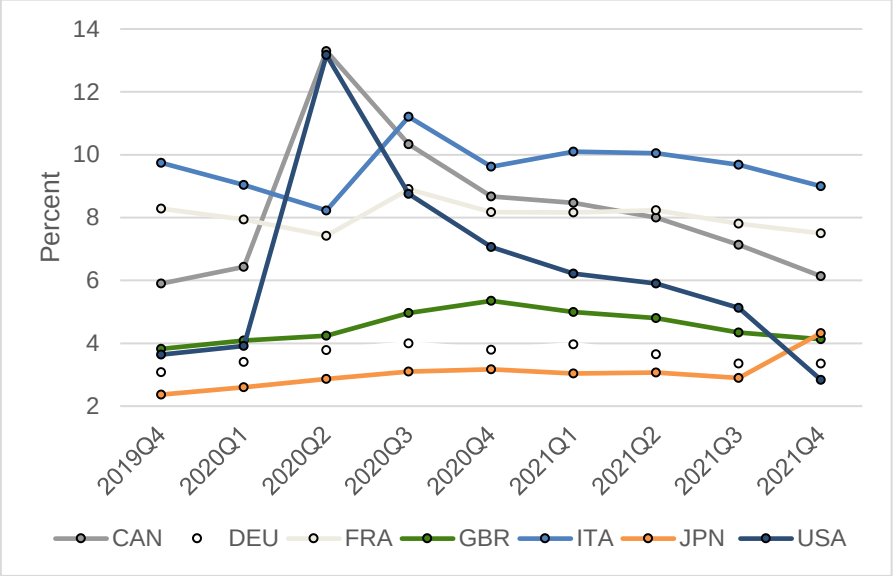
Panel A: Employment rate



[3] Labour shortages are covered in section 1 of the opening chapter of the forthcoming OECD Employment Outlook (OECD, 2022[1]). See also recent IMF work on labour market tightness in Advanced Economies (IMF, 2022[7]). Country-specific evidence is rich in the case of the United States ((Domash and Summers, 2022[51]), (Faberman, Mueller and Sahin, 2022[52]) (Furman and Powell III, 2021[44]), (Hobijn, 2022[53]), (Smith, Edgecliffe-Johnson and Zhang, 2022[45]). See (Forster van Aerssen et al., 2021[46]) on the United Kingdom. See (Pizzinelli and Shibata, 2022[8]) for an analysis of the United States and the United Kingdom.

[4] Countries covered are based on the availability of comparable data. The period considered is end 2019-end 2021. As became standard in the literature, Q4 2019 is considered as the onset of the pandemic. The latest available data point across countries is Q42021 unless otherwise stated.

Panel B: Unemployment rate



Note: Seasonally-adjusted data. Employment and unemployment rates for the population in working age (15-64).
Source: OECD Short-term Labour Market Statistics database.

Box 1. Data, definitions and measurement issues in a nutshell

A battery of indicators are used to gauge the extent of labour shortages in advanced economies (e.g. recently, (Niang, Bergeat and Parent, 2021[5])). These indicators include:

- The vacancy-to-unemployed ratio: defined as the number of unfilled jobs relative to the number of unemployed.
- The vacancy rate: defined as the share of unfilled jobs relative to all jobs.
- The quit rate: defined as the share of workers who recently left their job voluntarily, relative to total employment.

For EU countries, data on job vacancies are drawn from Eurostat, with the exception of France (for which data is drawn from Dares). The data source for Australia is the Australian Bureau of Statistics, for Canada it is Statistics Canada, for Israel the Central Bureau of Statistics, for the United Kingdom the Office of National Statistics, and for the United States the Bureau of Labour Statistics. Whenever possible, the analysis covers the period from the fourth quarter of 2019 to the fourth quarter of 2021 (2019Q4-2021Q4). When data for the fourth quarter of 2021 are not available, the analysis covers the period from the third quarter of 2019 to the third quarter of 2021.

Job vacancies are measured at the aggregate and industry levels. As a result, data availability and the degree of industry disaggregation can vary across countries. For most countries, vacancy data for agriculture are not available. To facilitate cross-country comparisons, aggregate vacancies refer to the total of industry, construction and services (except activities of households as employers, and extra-territorial organisations and bodies), with country-specific differences indicated in the text. Data are seasonally adjusted whenever possible.

For some countries, data are available for job vacancy rates but not for job vacancy numbers. In such cases, job vacancy numbers for country *c*, quarter *t* and industry *i* are imputed as follows:

$$JV\ number_{c,t,i} = \frac{JO\ rate_{c,t,i} * JV\ rate_{c,t,i}}{1 - JV\ rate_{c,t,i}}$$

where $JV\ rate_{c,t,i}$ refers to the job vacancy rate and $JO\ rate_{c,t,i}$ to the number of occupied jobs. When the number of occupied jobs is not available, it is proxied by the number of employed workers.

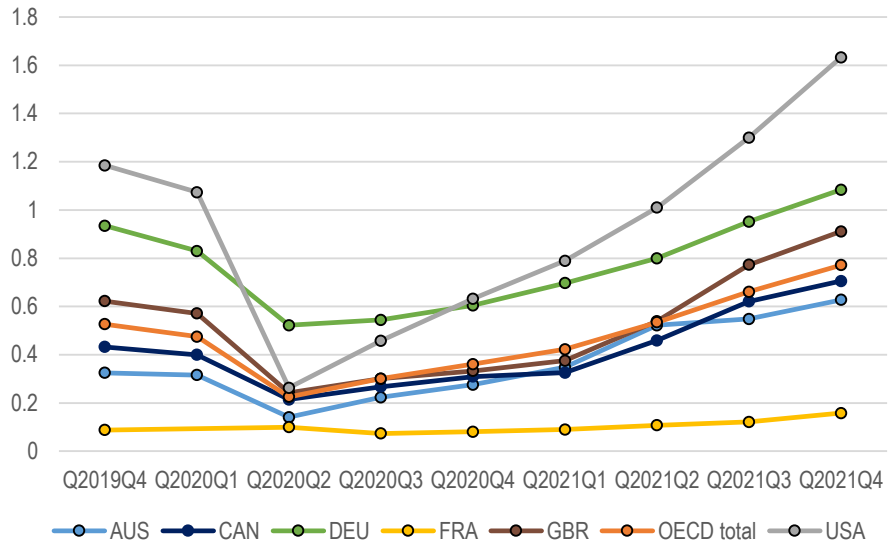
When job vacancy data are available on a monthly basis only (Israel and the United States), quarterly values are approximated by averaging monthly data.

See Annex for more details on data and measurement.

Emerging labour shortages: stylised facts

4. Labour markets have tightened in many OECD countries since the onset of the pandemic, especially in the Anglophone countries, where vacancy-to-unemployed ratios have been trending upwards (Figure 2). For example, in some countries, including the United States, labour markets were already tight before the pandemic and have become even tighter since then: there were 1.2 vacancies per unemployed in 2019Q4, and 1.5 two years later. Vacancy-to-unemployed rates have risen sharply in Australia, Canada and the United Kingdom. In other countries, such as France and Italy, labour markers have also tightened but from a situation of comparative slack at the beginning of the pandemic.

Figure 2 Labour markets have been tightening

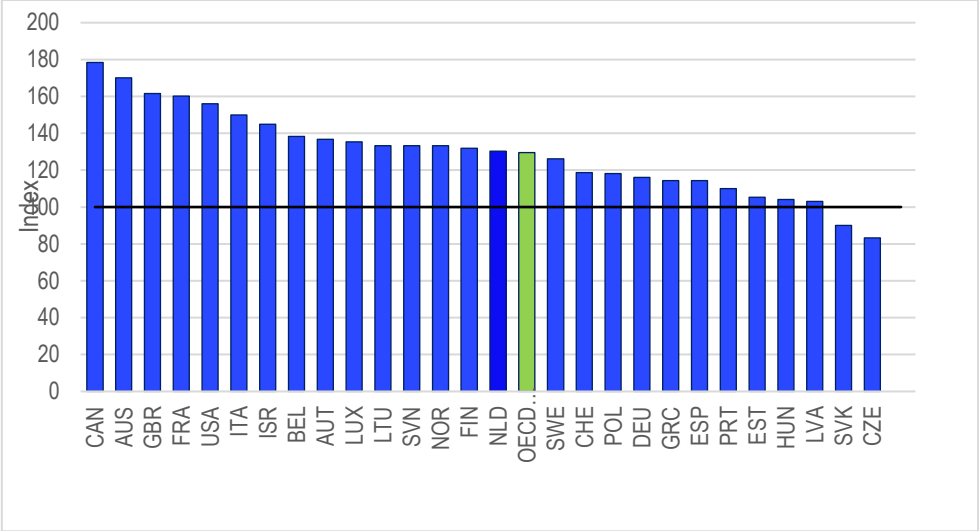


Note: Ratio between the number of vacancies and that of unemployed in selected OECD countries. See Annex for country profiles.
Source: Vacancies: Australian Bureau of Statistics (AUS), Statistics Canada (CAN), DARES (FRA), Office for National Statistics (GBR), Central Bureau of Statistics (ISR), US Bureau of Labor Statistics (USA), and Eurostat (OECD-EU). Unemployment; OECD Short-Term Labour Market Statistics database.

5. Job vacancy rates also point towards considerable labour market tightness in many countries (Figure 3). The United Kingdom and France saw a sharp increase in vacancy rates, but the labour market situation differs between the two countries: at the end of 2021, vacancy rates were much higher in the United Kingdom, at around 4%, than in France, at around 2%. Shortages were relatively stable in Central and Eastern European countries, yet labour markets remained tight in some of these countries, especially the Czech Republic.

Figure 3 Most OECD countries have been experiencing increasing labour shortages

Job vacancy rates, 2019Q4=100



Note: Job vacancy rates are on a quarterly basis and seasonally adjusted, with the exception of CAN. For CZE, the graph considers the latest available data point, 2021Q3.
Source: Australian Bureau of Statistics (AUS), Statistics Canada (CAN), DARES (FRA), Office for National Statistics (GBR), Central Bureau of Statistics (ISR), US Bureau of Labor Statistics (USA), and Eurostat (OECD-EU).

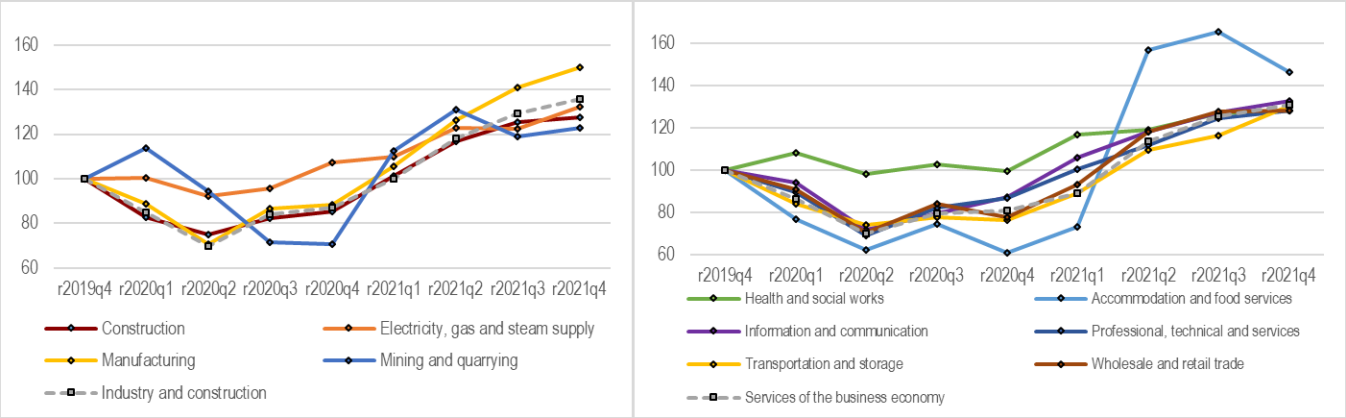
6. Industry-level data confirm the emergence of labour shortages in many countries. On average across the OECD, vacancy rates have increased the most in manufacturing along with accommodation and food (Figure 4, Panel A). To provide a more granular picture of the situation, Panel B of Figure 4 zooms on the six countries that have experienced the highest growth in job vacancy rates (based on Figure 3). For each country, industries are ranked according to the change in vacancy rates relative to pre-pandemic levels. The chart reports vacancies along with employment relative to pre-pandemic levels within the four industries where vacancies increased the most. This suggests the following stylised facts:

- Across all countries covered, industry-level vacancies increased significantly even though industry-level employment broadly returned to pre-pandemic levels. This is likely to reflect the sharp rebound in demand in the recovery context, but also tentatively some non-cyclical drivers affecting workers' preferences, as discussed below.
- Labour shortages have risen substantially in accommodation and food (with the exception of Italy). Attracting workers in those jobs has become a common challenge in a context where the pandemic has reinforced and made more visible the detrimental effects of low pay, poor working conditions and weak social protection on workers' living standards, health and more broadly well-being.
- A number of countries have been facing recruitment tensions in health and care-related jobs, aggravating shortages prevalent even before the pandemic. This may reflect that many of such "essential" jobs, for example nursing, are also often characterised by low pay, difficult working conditions and high risks, an issue exacerbated during the pandemic.
- Labour shortages are also emerging beyond contact-intensive services, including most notably in manufacturing and especially in Australia, Canada and the United States. In the information and communication sector, labour shortages are particularly acute in EU countries such as France and Italy (see Annex for the complete country coverage). This may reflect the COVID-19 driven amplification and acceleration of the digital transformation, with countries facing common challenges in the area of digital skills acquisition among workers, firms and territories. The United

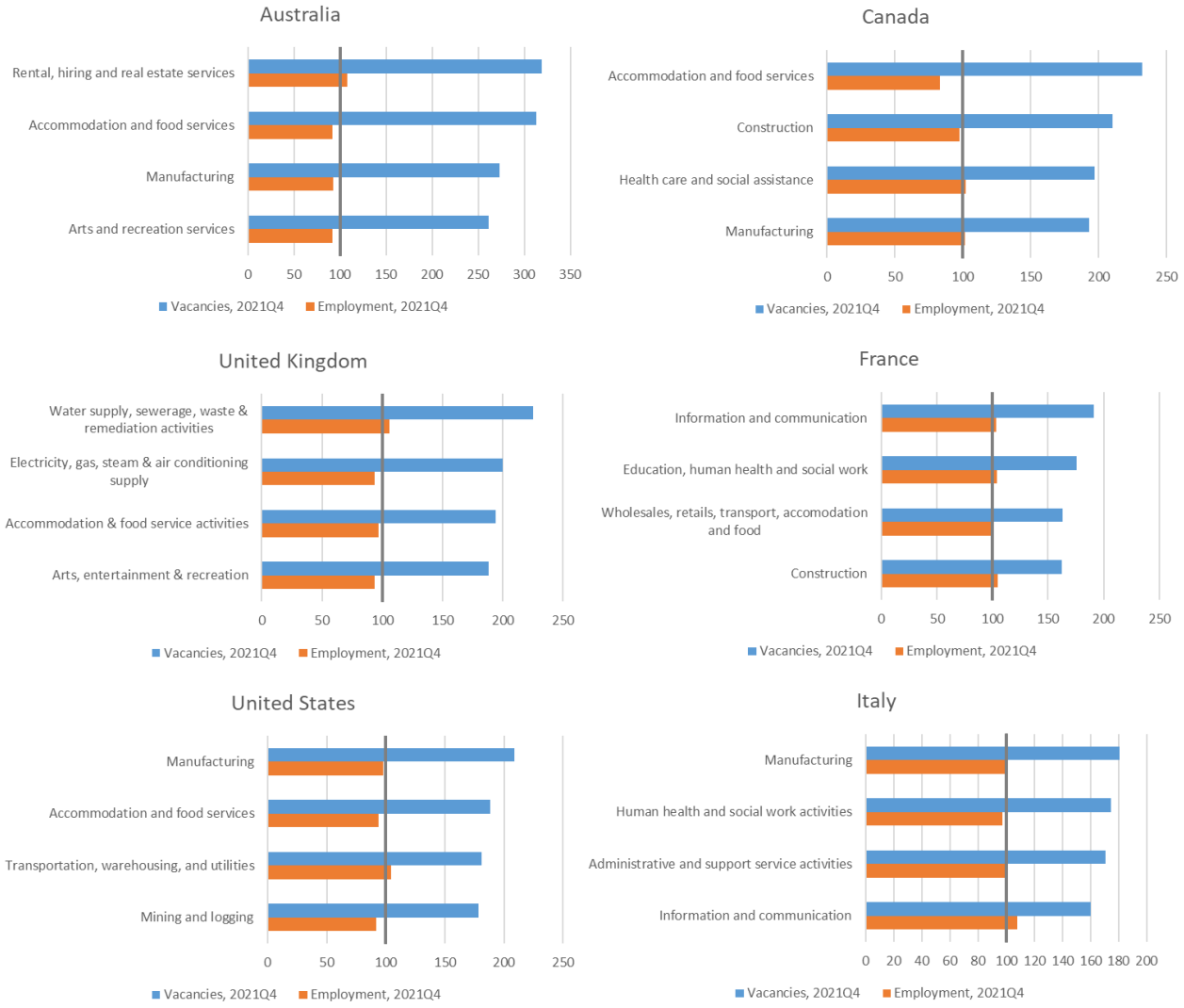
Kingdom stands out as featuring rising shortages in waste, water and energy-related industries and the United States in extractive industries.

Figure 4 The rise in labour shortages has been broad-based across industries

Panel A. Job vacancy rates across industries, 2019Q4=100, OECD average



Panel B. Job vacancies and employment across industries, 2019Q4=100, selected countries



Note: Job vacancy rate data is on a quarterly basis and seasonally adjusted whenever possible, with exceptions listed in the Annex. Panel A: The (unweighted) cross-country average covers the following countries: AUS, BEL, CAN, CZE, CHE, DEU, DNK, ESP, EST, FIN, GBR, HUN, ITA, LTU, LUX, LVA, NLD, NOR, POL, PRT, SVK, SVN, SWE and USA. Panel B: For each country, the four industries with the highest change in vacancy rates relative to pre-pandemic levels are shown. The Annex reports more country profiles for Panel B.
Source: Australian Bureau of Statistics (AUS), Statistics Canada (CAN), DARES (FRA), Office for National Statistics (GBR), Central Bureau of Statistics (ISR), US Bureau of Labor Statistics (USA), and Eurostat (OECD-EU).

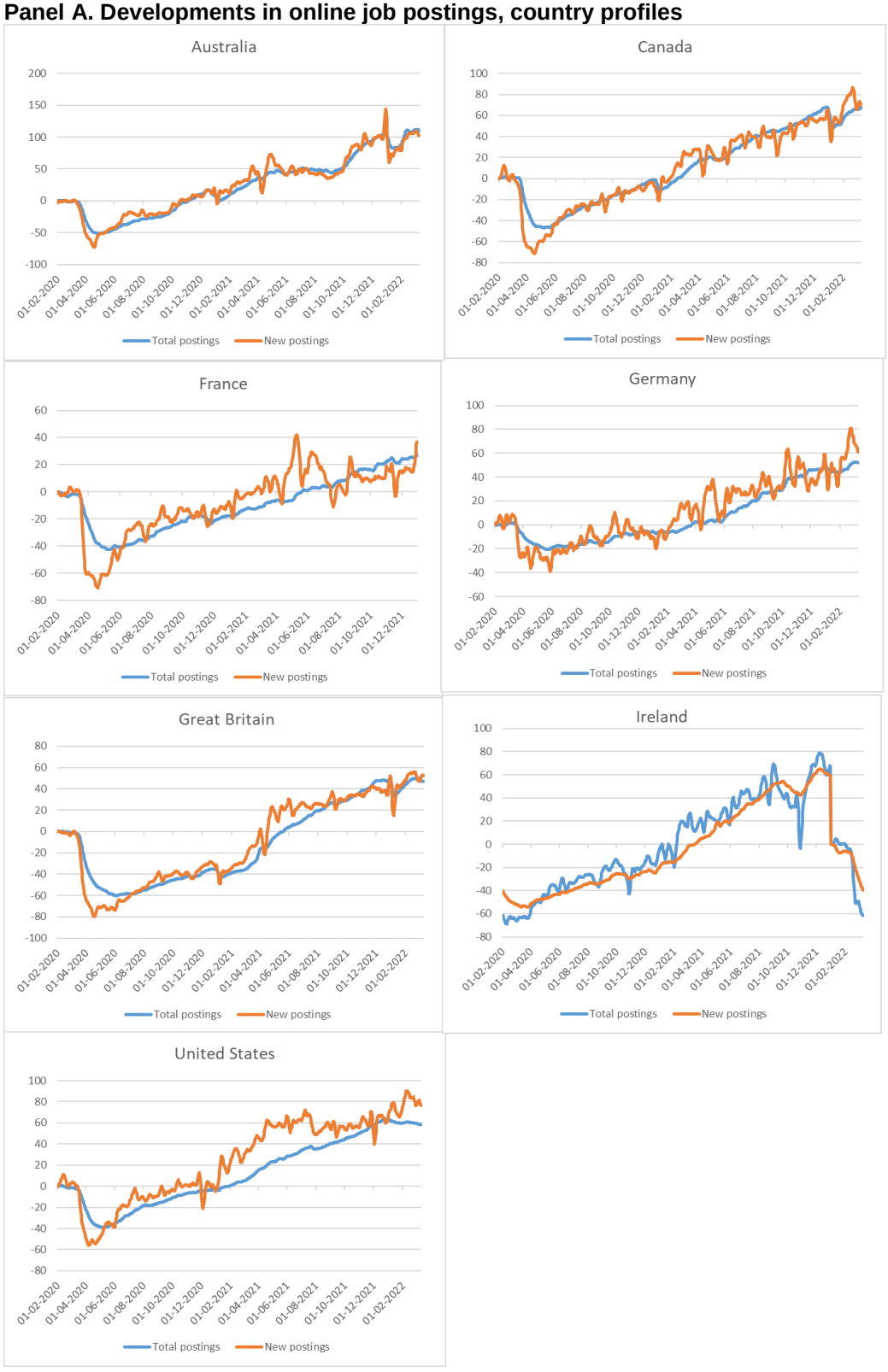
7. This picture of rising labour shortages based on official data sources on job postings can be complemented with an analysis of developments in online job postings. This analysis is based on Indeed Hiring Lab data, which have been used by researchers during the pandemic to track real-time developments in labour demand (see work by the OECD (Adrjan et al., 2021[6]) and the IMF (IMF, 2022[7])).[5] Information for a subset of OECD countries shows that online postings have been on the rise, particularly in Australia, Canada and the United States (Figure 5, Panels A and B). This may reflect the nature of policy support during the crisis, particularly by providing cash support to laid-off workers instead of maintaining the link between workers and firms through job retention schemes. Vacancies have been on the rise in occupations related to cleaning and sanitation, as well as personal care, nursing and medical support. With widespread recruitment difficulties, firms have been looking for workers specialised in recruitment, such as human resources experts, especially in Australia, Canada and the United States.

[5] One advantage of Indeed data is that the job classification is more granular than the standard (1-digit) industry classifications because it is based on algorithms analysing each text posted online. This is then aggregated and published under "occupational sectors" like childcare, nursing, loading and stocking, software development. Job offers are de-duplicated so that when the same job is collected from multiple sources it is shown only once. However, job postings on Indeed do not reflect a precise number of available jobs, because an opening may remain online for a period of time after being filled or may not be advertised online at all, and because employers can use a single job posting for multiple open positions. However, evidence suggests that the number of job postings on Indeed is broadly in line with job vacancies statistics from government surveys ((Adrjan and Lydon, 2019[47]); (Kennedy, 2021[48]), (Erik et al., 2021[49])).

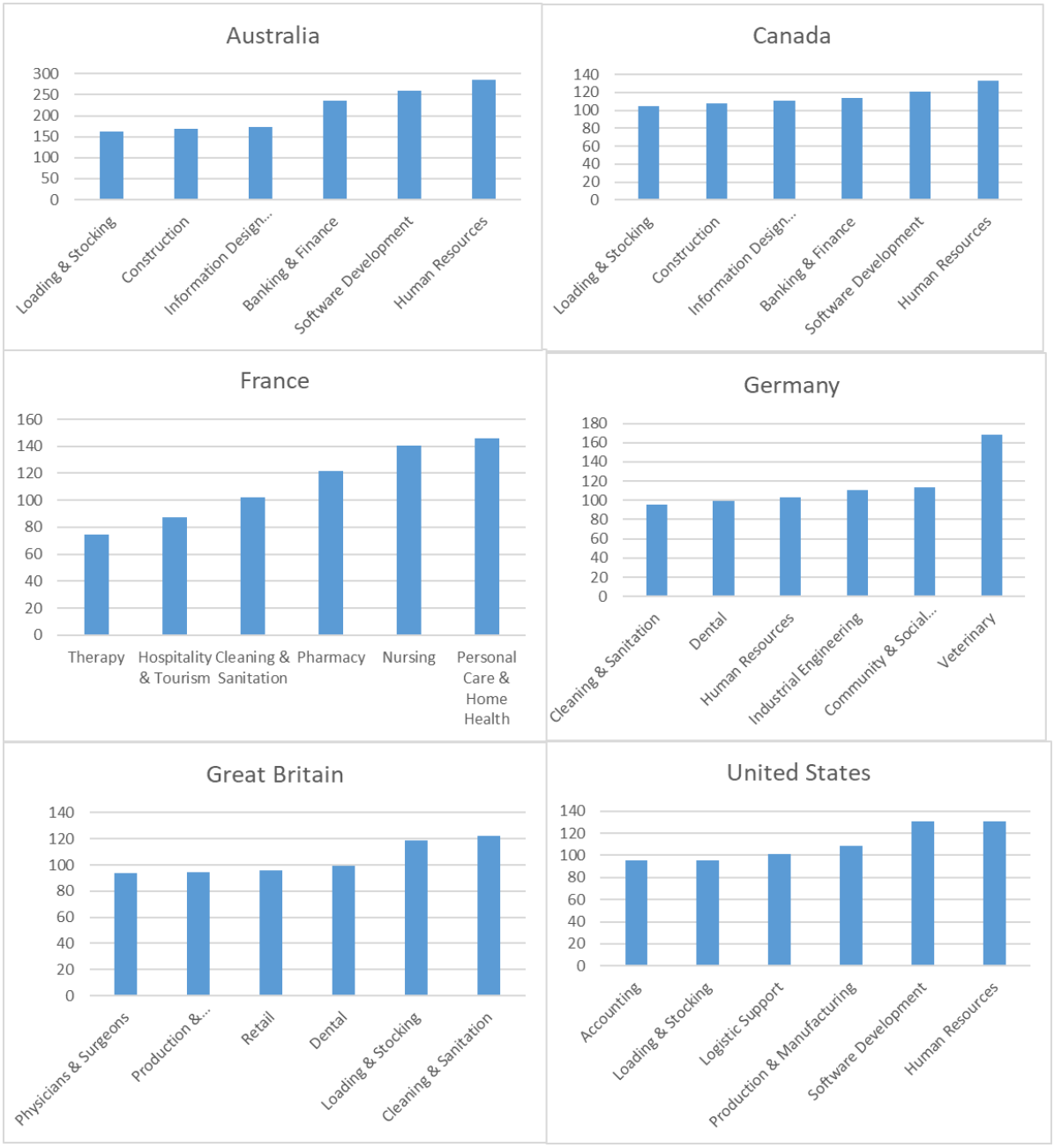
Figure 5 Faced with recruitment hurdles, firms are increasingly looking for recruitment experts

Online job postings, % change since 01-02-2020, country profiles

Panel A. Developments in online job postings, country profiles



Panel B. Job categories experiencing the highest increase in online posting, country profiles



Note: Seasonally-adjusted data. Disaggregated data are not publicly available for Ireland.
Source: Indeed. The data, extracted in March 2022, covers the period from 1-02-2020 till 11-03-2022.

Possible drivers of rising labour shortages: a focus on low-quality jobs

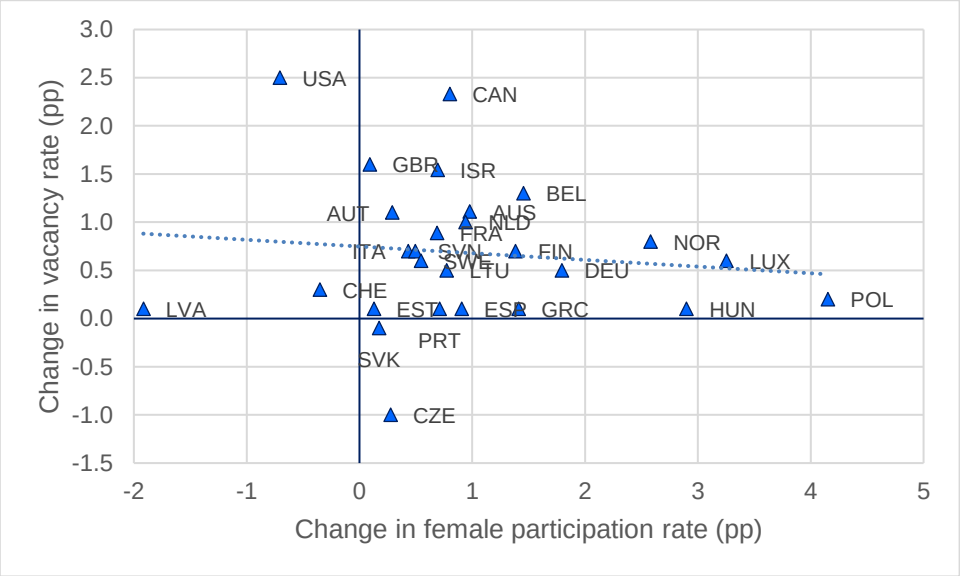
8. Evidence for the United States (e.g. (IMF, 2022[7]) and (Pizzinelli and Shibata, 2022[8])) suggests that one of the reasons behind rising and widespread labour shortages is that many workers, and especially women and seniors, withdrew from the labour market during the pandemic, due to fears of contagion, health issues and school closures in a context of inadequate childcare facilities; and many have not yet

come back to the labour market.[6] Panel A of Figure 6 shows that vacancies increased the most (least) in countries where the labour force participation of women and senior workers declined the most (least). However, this correlation is not very strong: while the United States experienced a decline in female labour force participation along with a marked increase in job vacancies, the vast majority of countries experienced either no change or an increase in female labour force participation along with an increase in job vacancies. Senior labour force participation rates went down significantly only in a few countries, especially in the United States, while most countries experienced either no change or an increase in senior participation.

Figure 6 Women and senior withdrawal from the labour market does not explain the rise in labour shortages across countries

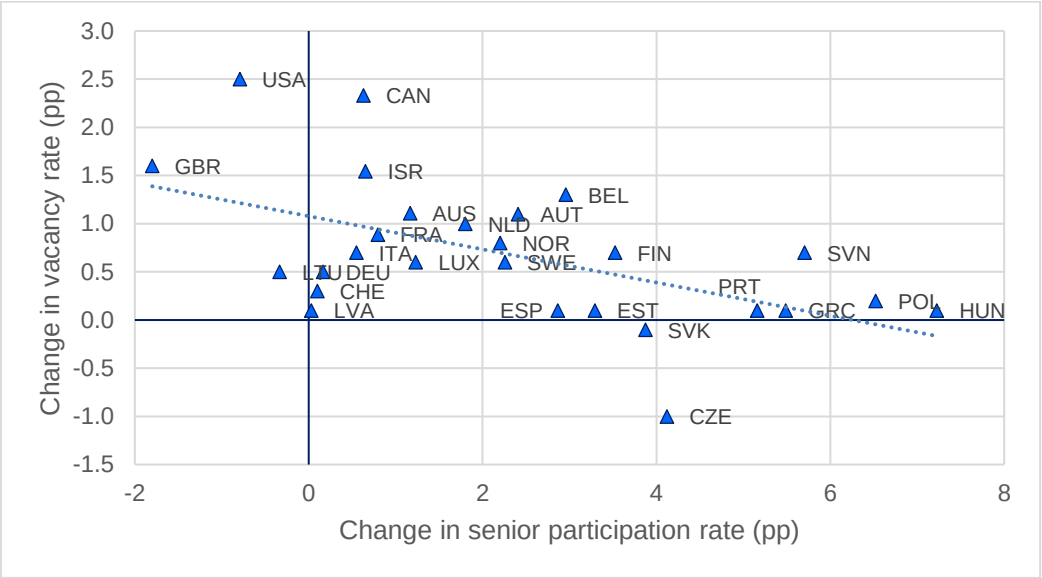
Changes in vacancy rates and labour force participation rates across OECD countries, 2019Q4-2021Q4 or latest available year

Panel A. Changes in vacancy rates and in female labour force participation rates



[6] (Faberman, Mueller and Sahin, 2022[52]) complement this extensive margin view with the intensive margin view by documenting a generalized decline in desired work hours in the US during the pandemic.

Panel B. Changes in vacancy rates and in senior labour force participation rates

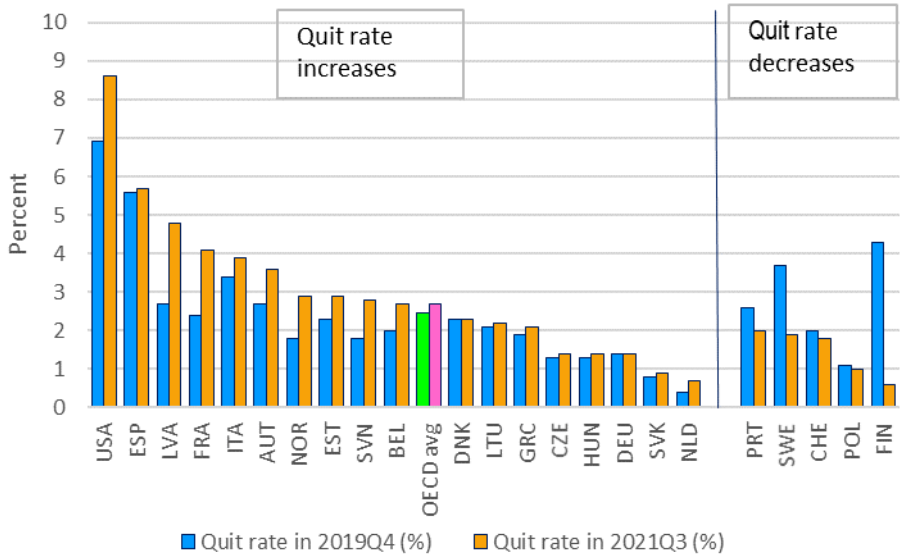


Note: For AUT, CHE, GRC, LTU and LUX, the change in labour force participation refers to 2021Q3, which is the latest available quarter. For CZE, the change in job vacancy rate refers to 2021Q3, which is the latest available quarter.
Source: Vacancy data: Australian Bureau of Statistics (AUS), Statistics Canada (CAN), DARES (FRA), Office for National Statistics (GBR), Central Bureau of Statistics (ISR), US Bureau of Labor Statistics (USA), and Eurostat (OECD-EU). Labour force participation data: OECD Short-term Labour Force Statistics Database with the following exceptions: senior labour force participation rate for GBR (ONS), senior labor force participation rate for NOR (ILO).

9. Rising job vacancy rates have gone hand-in-hand with rising quit rates (Figure 7). This has been particularly pronounced in the case of the United States, as recently discussed by e.g. (IMF, 2022[7]) and (Pizzinelli and Shibata, 2022[8]).

Figure 7 A "great quit" is taking place across a number of OECD countries

Quit rates across countries, 2019Q4 - 2021Q3



Note: For EU countries, the data are available on a quarterly basis, so the quit rate is defined as the share of workers who report having left their job in the last three months before the interview. For the United States, quarterly quit rates are proxied by the sum of monthly quit rates.
Source: Eurostat (OECD-EU), US Bureau of Labor Statistics, Job Openings and Labor Turnover Survey (USA).

10. This "great quit" or "great resignation" may reflect several factors including:

- Cyclical factors: job mobility is pro-cyclical and therefore increases when labour markets are tight (Causa et al., 2022[9]). Tighter labour markets increase workers' bargaining power and outside options, providing incentives to quit and look for better job opportunities (Bachmann et al., 2021[10]). Available data do not allow to properly track high-frequency job-to-job mobility on a cross-country and industry basis, but the employment recovery documented above in many countries and industries does suggests that rising quits are offset by rising hiring rates; evidence of which is available for the United States at the industry-level (Gould, 2022[11]).
- Structural factors: the COVID-19 crisis may have triggered a change in workers' preferences (IMF, 2022[7]).[7] Workers, including those that have been on the front line during the pandemic, are no longer accepting low-quality jobs, that is, jobs characterised by low-pay, bad working conditions e.g. shift hours, health risks and strenuous tasks, as well as poor social benefits. The data provide some supportive evidence of this argument for the United States (Figures 8-10):
  - ✓ Retail trade, food and hospitality, as well as manufacturing exhibit the highest rises in quit rates,
  - ✓ There is a strong negative cross-industry correlation between quit rates and pre-pandemic earnings, and
  - ✓ There is a strong positive cross-industry correlation between quit and vacancy rates.

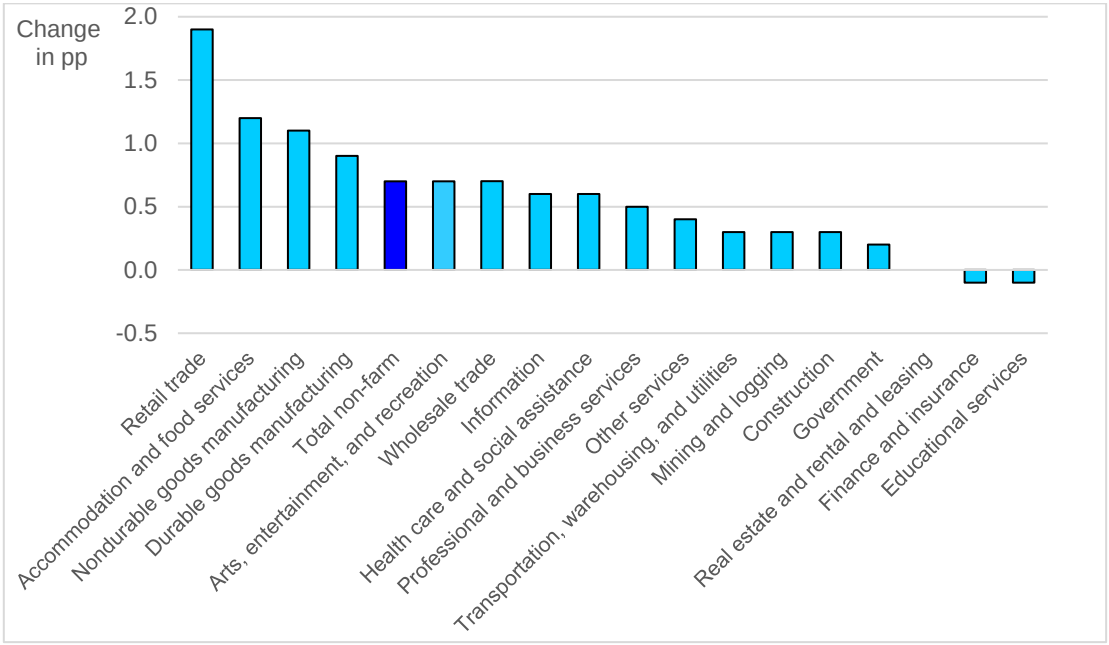
  Workers quitting their employer may not necessarily switch industry or occupations; rather, as vacancies are on the rise, they may be offered better pay and working conditions for the same activity by another employer. Indeed, preliminary evidence drawn from available country-specific studies reported in (OECD, 2022[1]) tends to report rising within-industry job mobility along with stable cross-industry job mobility. This is especially relevant for low-skilled workers who cannot rapidly requalify to switch industry, but who can nevertheless climb the job ladder by changing employer in the same industry. This overall picture and argument would be consistent with a new Pew Research Center survey[8]: i) low pay, a lack of opportunities for advancement and feeling disrespected at work are the top reasons why Americans quit their jobs last year, and ii) those who quit and are now employed elsewhere are more likely than not to say their current job has better pay, more opportunities for advancement, better work-life balance and more flexibility. Going further, future data-based research may allow to more formally and widely assess the nature and quality of ongoing job mobility dynamics.

[7] See also (Faberman, Mueller and Sahin, 2022[52]) and (Parker and Horowitz, 2022[50]).

[8] (Parker and Horowitz, 2022[50]).

Figure 8 Quit rates have increased in almost all industries, especially retail trade, hospitality and food

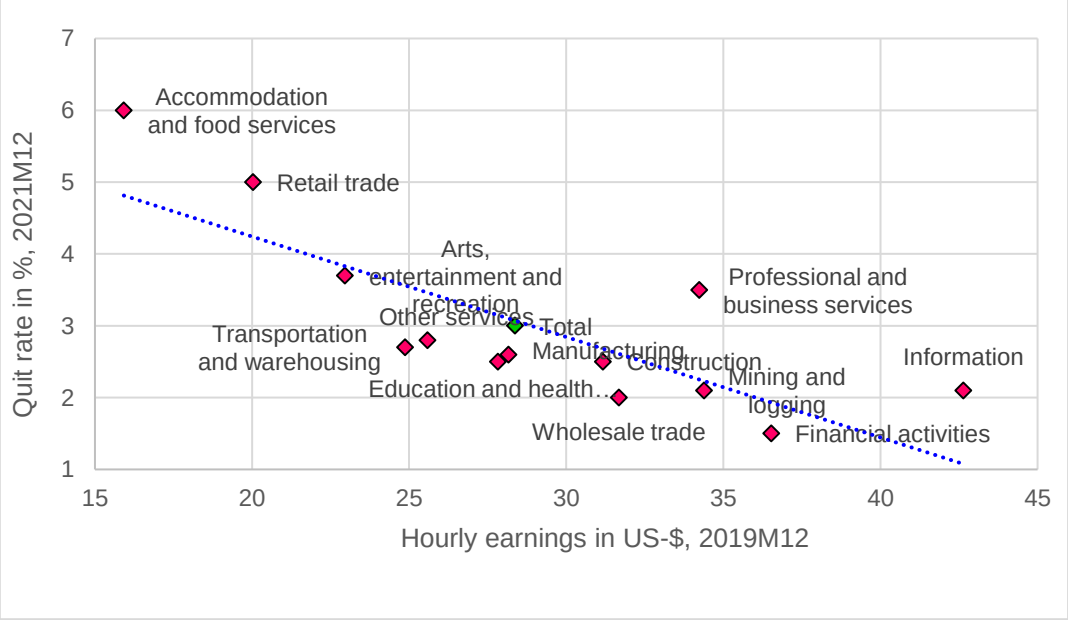
Developments in quit rates across industries, United States, 2019M12-2021M12



Note: Seasonally-adjusted data. NAICS 2017 industry classification.
Source: Job Openings and Labor Turnover Survey, US Bureau of Labor Statistics.

Figure 9 Quit rates are strongly negatively correlated with wages pre-pandemic across industries

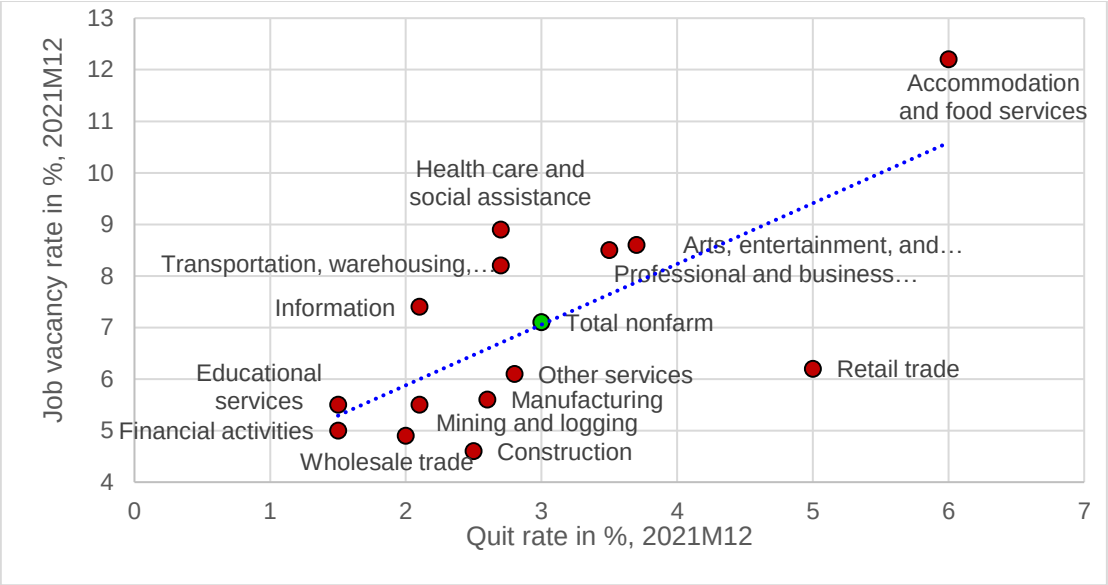
Quit rates in 2021M12 and hourly earnings in 2019M12 across industries, United States



Note: Seasonally-adjusted data. Total industries refers to total non-farm industries for quit rates.
Source: US Bureau of Labor Statistics. Quit rates: Job Openings and Labor Turnover Survey. Earnings data: Current Employment Statistics Survey.

Figure 10 Job vacancy rates are positively correlated with quit rates across industries

Vacancy and quit rates across industries, United States, 2021M12



Note: Seasonally-adjusted data. NAICS 2017 industry classification.
Source: Job Openings and Labor Turnover Survey, US Bureau of Labor Statistics.

Policy implications

11. Labour shortages have emerged across several advanced OECD economies since the beginning of the pandemic. This phenomenon has been widespread across countries (particularly in Australia, Canada and the United States) and industries (particularly in contact-intensive ones, especially accommodation and food, and manufacturing). Labour shortages are to a good extent driven by cyclical factors, e.g. the steep rebound in economic activity and demand in the recovery from the pandemic. In tight labour markets, workers are more likely to switch for better job opportunities (although available data do not yet allow for properly analysing this hypothesis). But other factors beyond the economic cycle may also play a role, as discussed in (IMF, 2022[7]) and (OECD, 2022[1]). The post-COVID 19 increase in labour shortages may also partly reflect structural changes, in particular changes in preferences, as some workers may no longer accept low-pay and poor or strenuous working conditions.

12. Recent OECD analysis consistently argues that the crisis has drawn attention to the low quality of many frontline jobs (see Chapter 1 in (OECD, 2022[1])). This argument is based on two major highlights from the analysis: i) occupations involving a higher risk of COVID-19 infection[9] employed more low-paid, young and low educated workers, and ii) frontline workers[10] report lower job security, lower health and mental well-being and a much higher risk of contagion.

[9] At risk occupations are defined as jobs that were typically not done remotely before the pandemic and involved a considerable level of physical proximity to other people. The list of such occupations include health and personal care-related occupations, food, retail trade and hospitality, but also manufacturing, mining and construction. See Chapter 1 in (OECD, 2022[1]) for the classification framework and the subsequent list of occupations.

[10] Frontline workers are defined as those answering “Always”, “Most of the time” or “Sometimes” to the question: “In your work, are you currently in direct physical contact with people (colleagues, customers, passengers, pupils, patients, etc.)?” and who do not report “home” as a location of work during the pandemic. See Chapter 1 in (OECD, 2022[1]).

13. While priorities will vary depending on country-specific context, a number of policy options can be considered to make jobs more attractive to workers where labour shortages are most acute:

- Enhancing the coverage of social protection (health insurance, sick leave, unemployment benefits, temporary short-time work schemes) to e.g. non-standard workers.
- Encouraging firms to offer flexible working conditions in terms of e.g. hours worked and, when feasible, teleworking, accompanied by adequate digital skills training and infrastructure.
- Pursuing policy efforts across a wide range of areas, from e.g. family policies to labour regulations and taxation to reduce gender gaps in the labour market; in particular, ensuring access to affordable quality childcare and well-targeted child-related benefits.
- Stepping-up active labour market policies to encourage requalification and reallocation for jobseekers but also for workers who need reskilling: i) in the short-run, by establishing fast-track programmes to help addressing rising tensions in relatively low-qualified jobs -- for example in the area of personal care, ii) in the medium and long-term, by designing policy packages to support workers' transitions towards low-carbon activities. Policies targeting employers are likely to have a role in encouraging reallocation. This could include the provision of wage subsidies for firms that retrain or hire unemployed workers in roles they don't have previous experience in.[11]
- Promoting workers' bargaining rights over pay and working conditions in highly-concentrated labour markets where firms have monopsony power by e.g. i) integrating labour market considerations in competition policy and, ii) reducing barriers to job-to-job mobility, including by reforming occupational licensing regulations and non-compete clauses.[12] At the current juncture of high inflation, labour market policy actions to enhance workers' bargaining power may face a difficult trade-off with macro policy to avoid wage-price spiralling effects.
- Facilitating inflows of international migrants while ensuring complementary integration policies and effective recognition of qualifications acquired abroad. Reforms in this area are becoming priority in order to address the ongoing war in Ukraine, especially among European countries.

[11] (Stantcheva, 2022[54]) highlights the positive record of such employer-focused active labour market policies in the US.

[12] See recent OECD evidence and policy discussion on monopsony and labour market concentration (Chapter 3 of forthcoming OECD Employment Outlook 2022, (OECD, 2022[1])).

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Annex

Data sources and definitions

Definitions and data sources are summarized in Box 1. This Annex provides some additional information.

Labour market statistics for European countries are based on Eurostat data (EU LFS), extracted on March 20th 2022. From 2021 onwards, these data follow the regulatory framework (EU) 2019/1700 and Commission Implementing Regulation (EU) 2019/2240, which have determined an update in some definitions, including those of employed, unemployed and outside the labour force populations. More details about these changes can be found in the Eurostat metadata documentation.[13]

Employment and job vacancies are reported by industry based on the 1-digit level NACE rev. 2 classification documented in Table A1.

Table A1. Industry classification

Section	Description
B	Mining and quarrying
C	Manufacturing
D	Electricity, gas, steam, air conditioning; Water supply, sewerage, waste management and remediation activities
E	Construction

[13] More information can be found at: EU-LFS (Statistics Explained) - Data and Publication >>> Comparability over time

F	Wholesale and retail trade; Repair of motor vehicles and motorcycles
G	Accommodation and food service activities
H	Transportation and storage; Information and communication
I	Financial and insurance activities
J	Real estate activities; Professional, scientific and technical activities; Administrative and support service activities
K	Public administration and defence; compulsory social security
L	Education
M	Human health and social work activities
N	Arts, entertainment and recreation; Other service activities

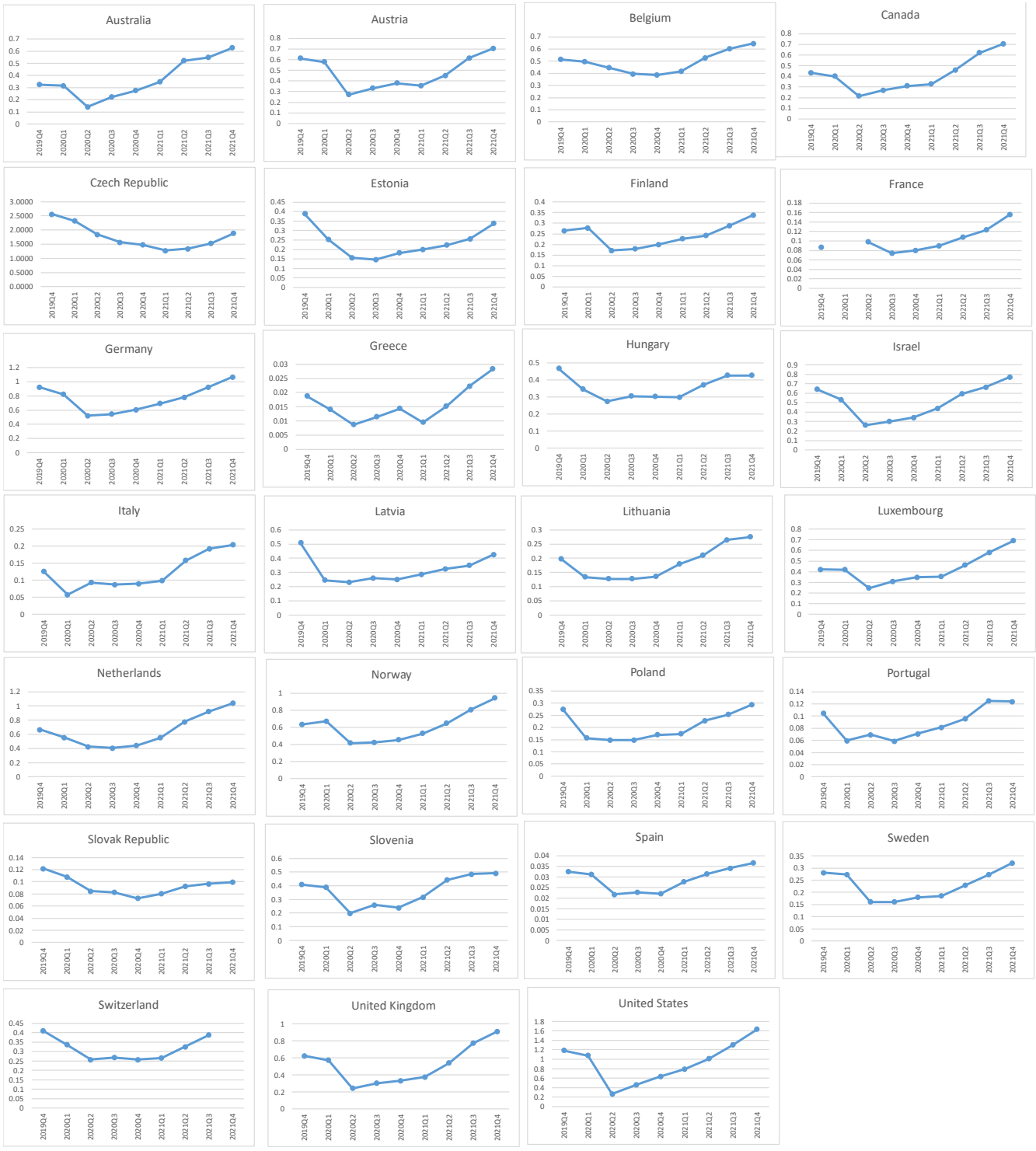
Note: As standard in the literature, NACE sectors "Agriculture, forestry and fishing", "Activities of households as employers, undifferentiated goods- and services-producing activities of households for own use" and "Activities of extraterritorial organisations and bodies" are excluded.
Source : EU Labour Force Survey Database User Guide.

Whenever possible, seasonally-adjusted data series are used. When necessary, the series are integrated using non-seasonally adjusted data. For Canada, only non-seasonally adjusted vacancy data are available.

Country profiles

Country profiles in Figure A1 report quarterly levels of the ratio of vacancies to unemployed, over the period 2019Q4 to 2021Q4. Iceland is not included due to data availability issues.

Figure A11. Vacancies per unemployed, country profiles

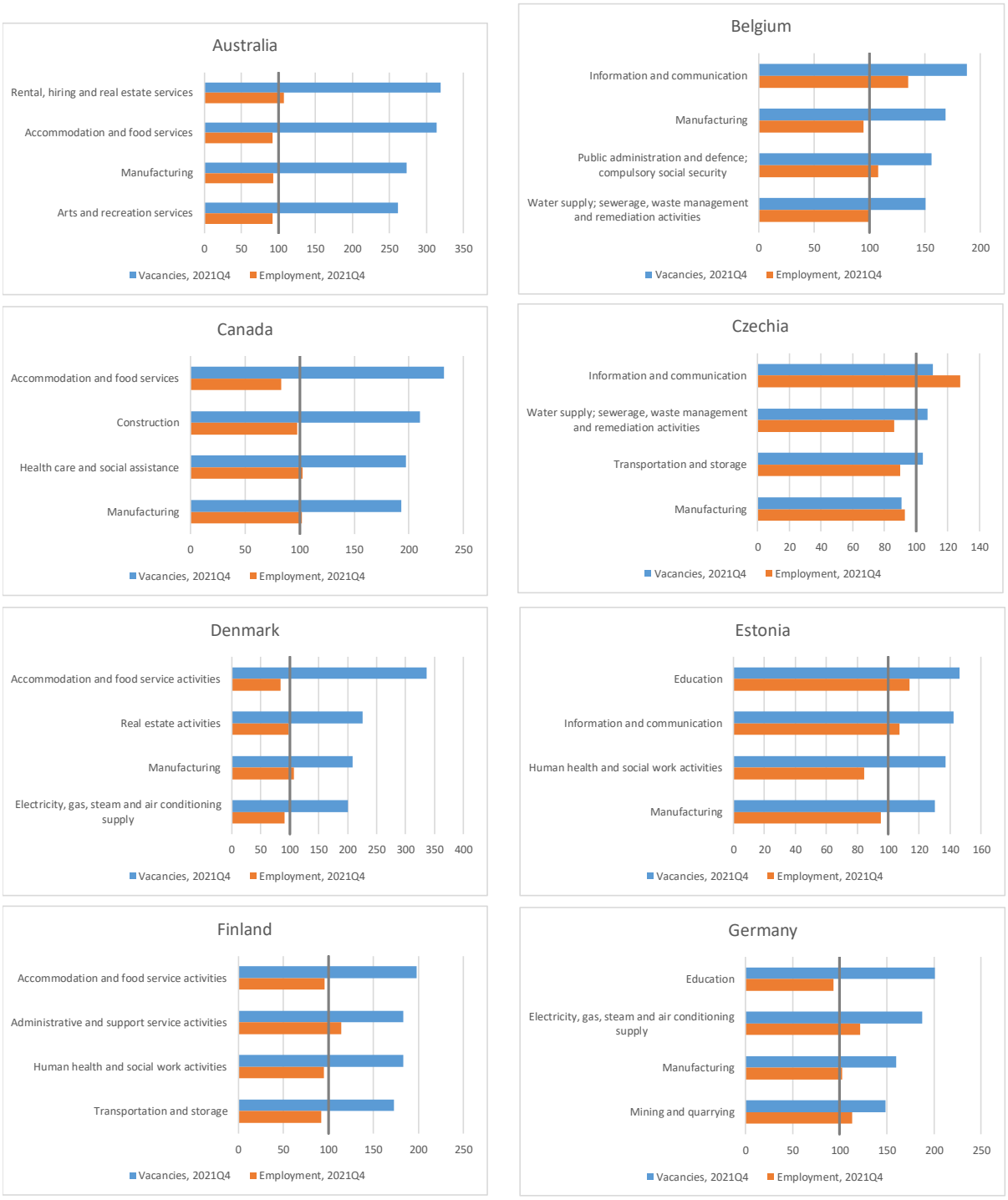


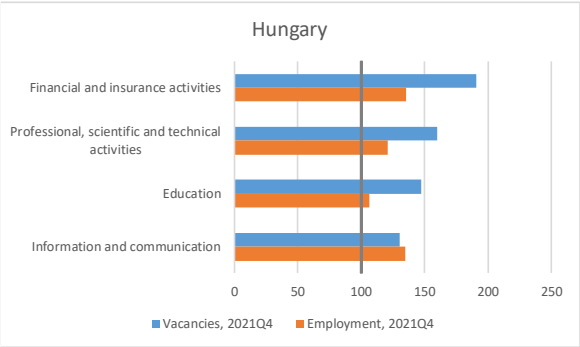
Note: Ratio between the number of vacancies and that of unemployed. Whenever available, seasonally adjusted data are used. When necessary, the series are integrated using non-seasonally adjusted data. For CAN, CHE, and HUN, only non-seasonally adjusted data are available.

Sources: Vacancy data: Australian Bureau of Statistics (AUS), Statistics Canada (CAN), DARES (FRA), Office for National Statistics (GBR), Central Bureau of Statistics (ISR), US Bureau of Labor Statistics (USA), and Eurostat (OECD-EU). Unemployment: OECD Short-Term Labour Statistics database.

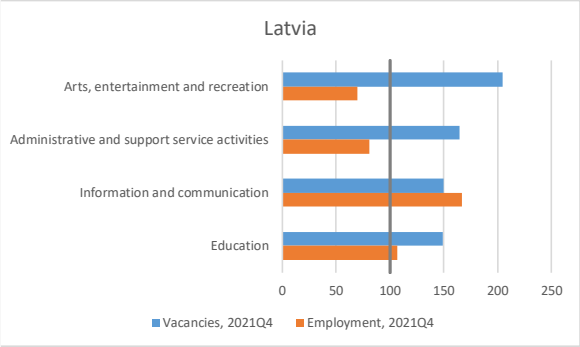
Figure A2 reports the 2019Q4 - 2021Q4 change in job vacancies and employment in the four industries experiencing the highest percentage increase in job vacancies, for the countries not covered in Figure 4B of the main paper. Austria, Greece, Iceland, Israel, Luxembourg and Switzerland cannot be included due to limited industry-level vacancy data.

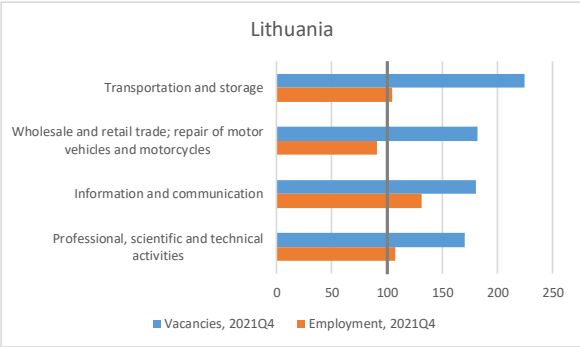
Figure A12. Job vacancies and employment across industries, country profiles, 2019Q4=100

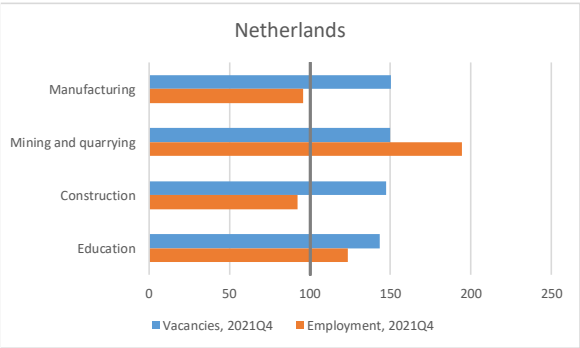


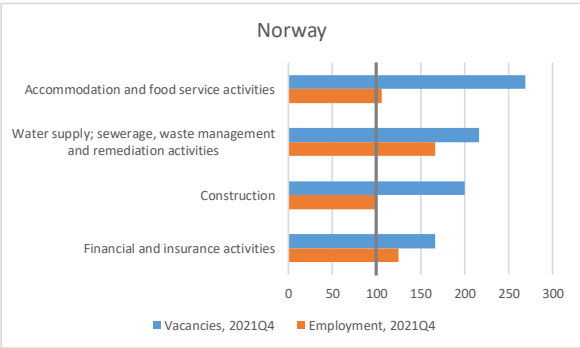

Hungary
Financial and insurance activities
Professional, scientific and technical activities
Education
Information and communication
0 50 100 150 200 250
Vacancies, 2021Q4
Employment, 2021Q4

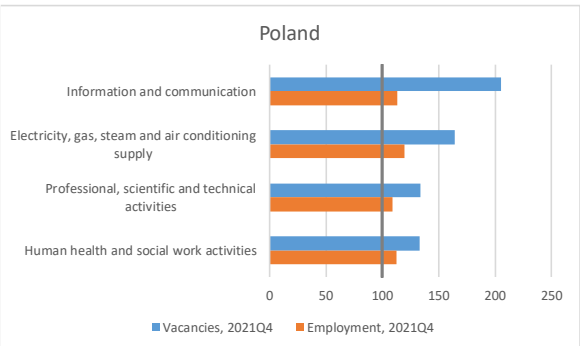

Iceland
Construction
Information and communication
Public administration and defence; compulsory social security
Financial and insurance activities
0 50 100 150 200
Vacancies, 2021Q4
Employment, 2021Q4

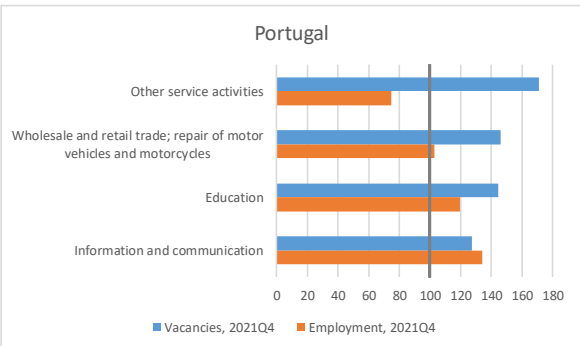

Latvia
Arts, entertainment and recreation
Administrative and support service activities
Information and communication
Education
0 50 100 150 200 250
Vacancies, 2021Q4
Employment, 2021Q4

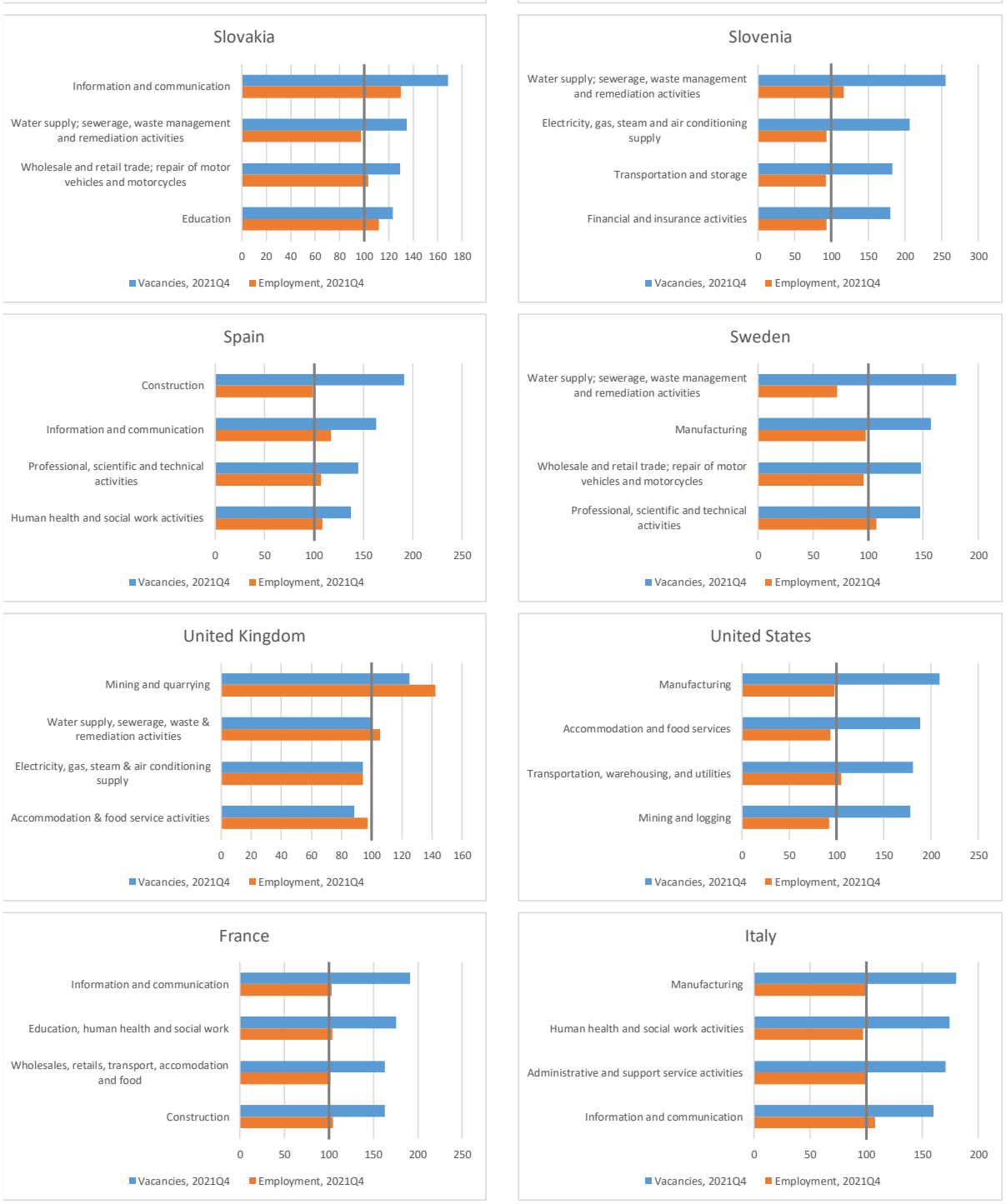

Lithuania
Transportation and storage
Wholesale and retail trade; repair of motor vehicles and motorcycles
Information and communication
Professional, scientific and technical activities
0 50 100 150 200 250
Vacancies, 2021Q4
Employment, 2021Q4


Netherlands
Manufacturing
Mining and quarrying
Construction
Education
0 50 100 150 200 250
Vacancies, 2021Q4
Employment, 2021Q4


Norway
Accommodation and food service activities
Water supply; sewerage, waste management and remediation activities
Construction
Financial and insurance activities
0 50 100 150 200 250 300
Vacancies, 2021Q4
Employment, 2021Q4


Poland
Information and communication
Electricity, gas, steam and air conditioning supply
Professional, scientific and technical activities
Human health and social work activities
0 50 100 150 200 250
Vacancies, 2021Q4
Employment, 2021Q4


Portugal
Other service activities
Wholesale and retail trade; repair of motor vehicles and motorcycles
Education
Information and communication
0 20 40 60 80 100 120 140 160 180
Vacancies, 2021Q4
Employment, 2021Q4



Note: Seasonally adjusted data used whenever possible. Specifically, seasonally adjusted data for vacancies are available for: AUS, BEL, DEN, FRA, GBR, HUN, ITA, LVA, SVK, SVN, USA. Only non-seasonally adjusted data are available for: CAN, CZE. For the remaining countries, seasonally adjusted data are used when available, and non-seasonally adjusted when necessary. Employment data are on a quarterly basis and seasonally adjusted. More details available upon request.
Source: Australian Bureau of Statistics (AUS), Statistics Canada (CAN), DARES (FRA), Office for National Statistics (GBR), US Bureau of Labor Statistics (USA), and Eurostat.