

Building new data to understand the impacts of skill shortages on country-level performance

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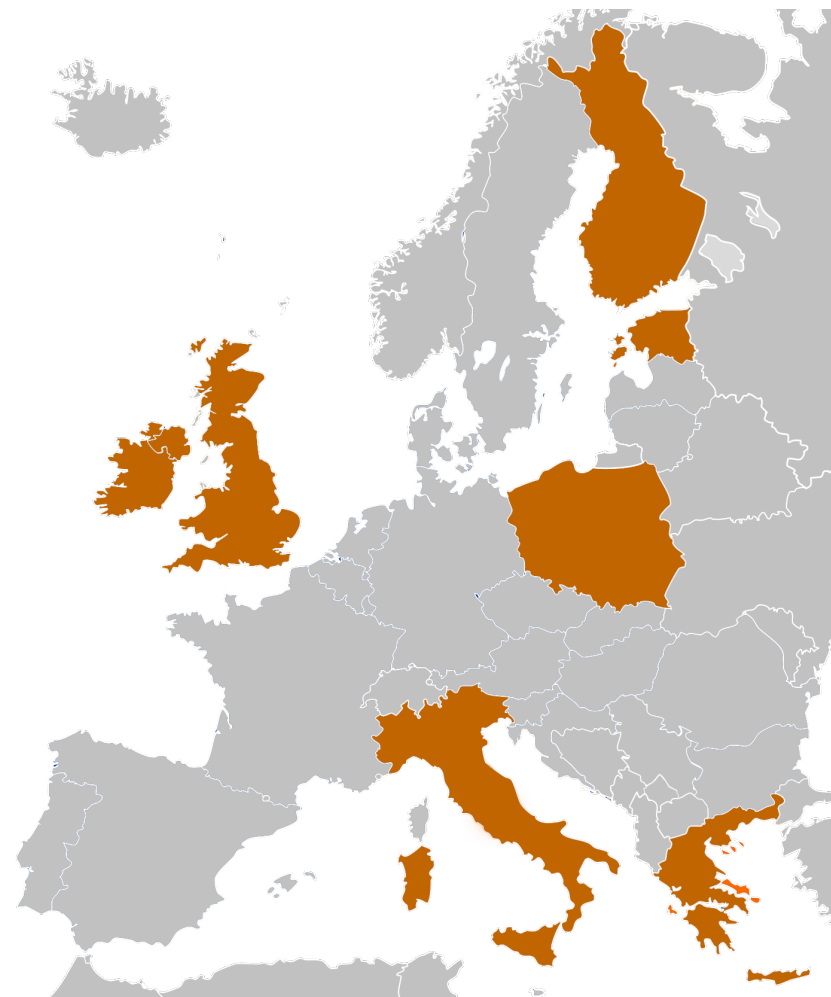


SkillsPulse: Skills · Predicting, Understanding, and Locating Shortages in Europe – SkillsPulse

SkillsPULSE will provide a methodology for identifying the extent, causes, and implications of skills deficiencies in Europe. A series of indicators, including a **Skills Shortage Index**, will be developed and incorporated into a **software tool** for use by those responsible for labour market skills intelligence at both national and European levels.



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- **Conceptualisations of skill shortages and skill gaps**
- **Empirical investigation of skill gaps in Europe**
- **Building new data to understand the impacts of skill shortages on country -level performance**



- The academic and policy research on skill shortages and skill gaps is limited when compared to other forms of skill mismatches. McGuinness et al. (2025) estimate that between 2002 and 2022 there were just 14 academic studies published on skill shortages.
- A **skill shortage** refers to a situation where there are no external qualified candidates to fill vacant positions.
- Two predominant approaches : **(i) employer- or employee-reported data**, this approach relies on direct feedback from employers or employees regarding their perceived skills shortages, offering valuable first-hand insights into workplace challenges; **(ii) objective indicators**, this methodology employs empirical data, primarily focusing on job vacancy data, statistics and various indirect measures, such as wage growth patterns and employment metrics.
- There is a lack of measurement consistency across the measurement approaches that do exist.

- We developed a **novel methodology to identify potential skill shortages** in the EU labour market, that is identifying the jobs within occupations that are likely to be difficult to fill.
- We combine a subjective (employee survey data) and an objective (online job advertisement data) approach.
- We attempt to distinguish between skills shortages and labour shortages. Labour shortages exist due to a lack of applicants willing to undertake a particular job, as opposed to a lack of candidates with the necessary skills to do the job effectively (skills shortages).

We identify job characteristics associated with potential skill shortages/ difficult to fill-in vacancies. We use two datasets:

- Cedefop's **2021 European Skills and Jobs Survey** (subjective measure) is an employee survey. We identify detailed job characteristics that are likely to make the job more difficult to fill, should openings become available to the labour market. We calculate the % of jobs that are likely to be difficult to fill at a 2-digit ISCO level.
- **Lightcast data** (objective measure) is the near universe of job advertisement data. We identify job characteristics (similar to the ESJS) likely to make the vacancy more difficult to fill. We identify the proportion of jobs in each ISCO 2-digit category that are difficult to fill.
- **The benchmarking** of an objective measurement approach (OJA) based on a dataset reflecting the current distribution of skills and competencies being utilised within the labour market (ESJS data) is a **novelty/advancement** in the measurement of skills shortages at both a national and European level.

- The ESJS dataset reflects the current distribution of skills and competencies being utilised within the labour market. However, it is a periodic cross-section, and while any measure of potential skill shortage will reflect the distribution of jobs in 2021, it also has drawbacks in that
 - (a) the flow of jobs that are advertised may not accurately mirror the stock of existing jobs, particularly, as many high skilled vacancies will be filled internally
 - (b) the estimates of potential skill shortages cannot be replicated for years subsequent to 2021.
- Lightcast data reflects the distribution of current vacancies and can be estimated on an annual basis at an EU and member state level.

Methodology



When all seven conditions below explained hold simultaneously, a job is identified as a potential skill shortage within the 2021 ESJS.

- 1. Complex job within occupation:** we create a composite index (from 0 to 6) with intermediate and high level of foundational skills (reading, writing and math). The job is complex when the value of the index is higher than the average calculated at occupational level.
- 2. Economy wide-complex job:** same criteria as per complex job index, but with a skill intensity above the average for the general economy/labour market.

3. High task requirements within occupation: we create a task index with the sum of the work organisation variables, creative tasks variables and digital tasks variables (incorporates 17 tasks). The job has a higher number of tasks when the value of the task index is higher than the average calculated at occupational level.

4. High task requirement at country level

5. Long tenure: jobs with tenure longer than 1 year.

6. Higher wage within occupation: if the monthly net wage is above the average monthly net wage calculated at occupational level.

7. Higher wage at country level



Where all six of the below explained conditions apply to job vacancies, we identify them as potential skill shortages in 2021 Lightcast data.

- 1. High Competency requirements within occupation:** if the vacancy contains an above-average number of competencies for each occupation (only 'Hard skills', so the very technical ones).
- 2. Economy-wide high competency requirements:** if the vacancy contains an above-average number of competencies (average at country level).
- 3. Previous Experience:** when experience required by the job posting is above one year.

4. **High salary within occupation:** if a job vacancy displays an above-average salary calculated at occupational level.

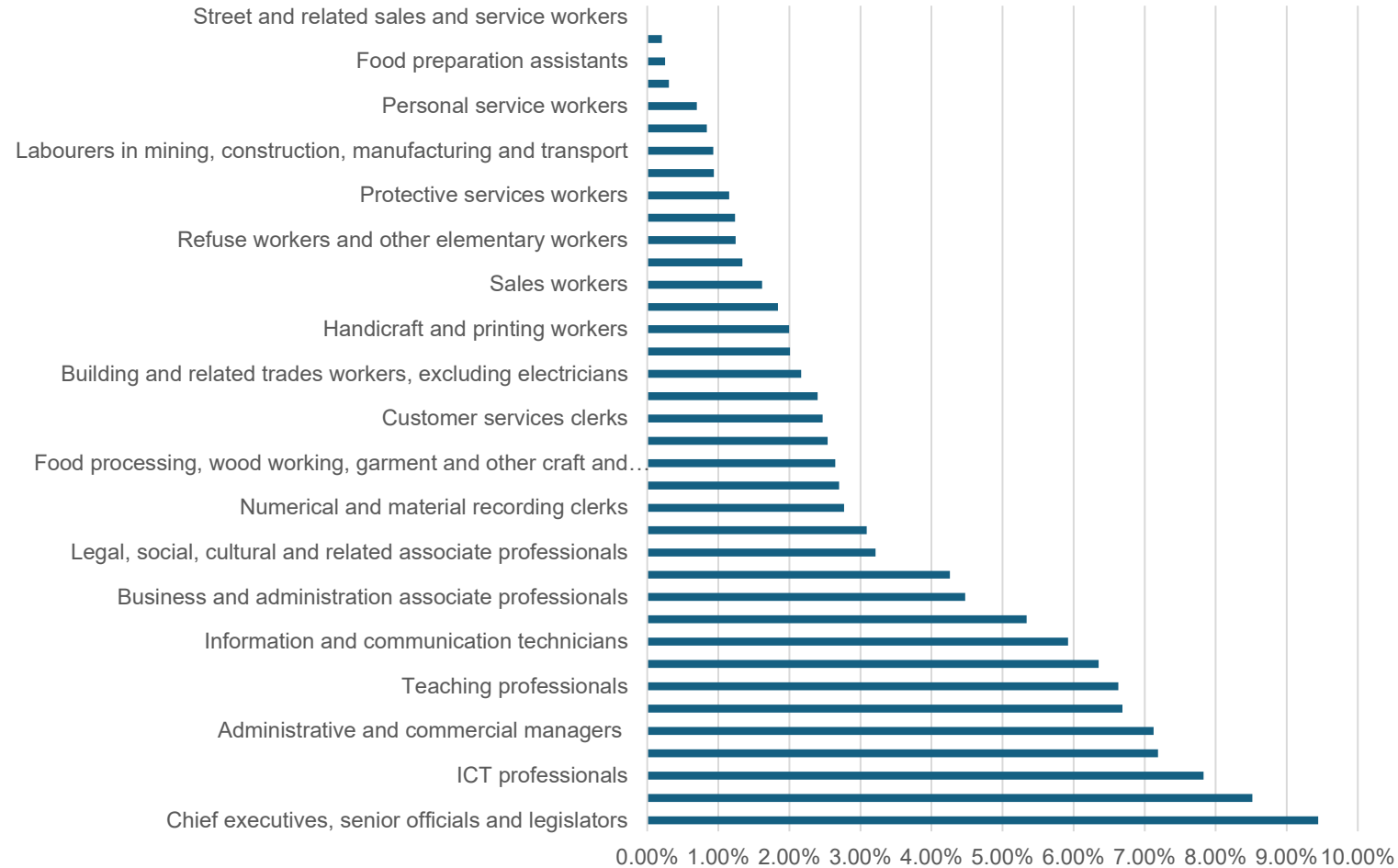
5. **High salary at country level**

6. **Long online duration:** over 30 days and below 119 (data issue for bunching around 120 days)

Results



Incidence of potential skill shortages across ISCO 2-digit occupation – ESJS2 EU 27 + Iceland and Norway



The overall EU share of jobs estimated to be *potential skill shortages* (should openings become available to the LM) stands at around **3.5 per cent**

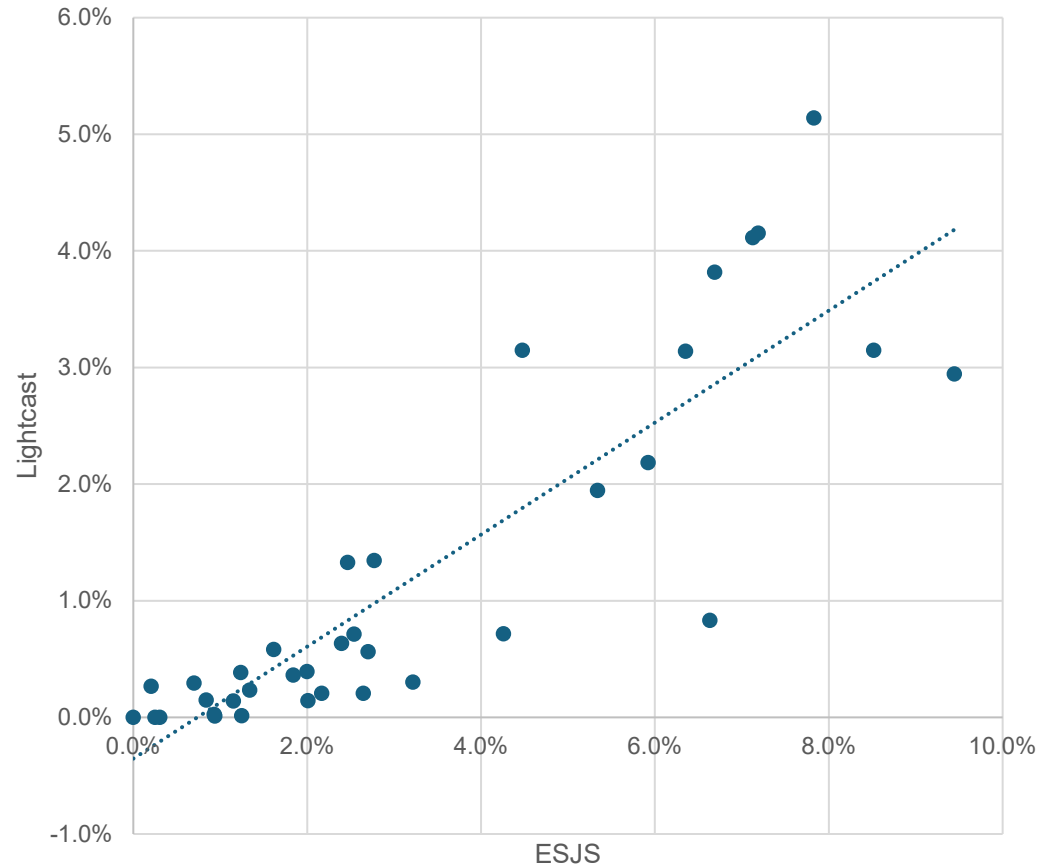


Incidence of skill shortages across ISCO 2-digit occupation – Lightcast EU27 + UK



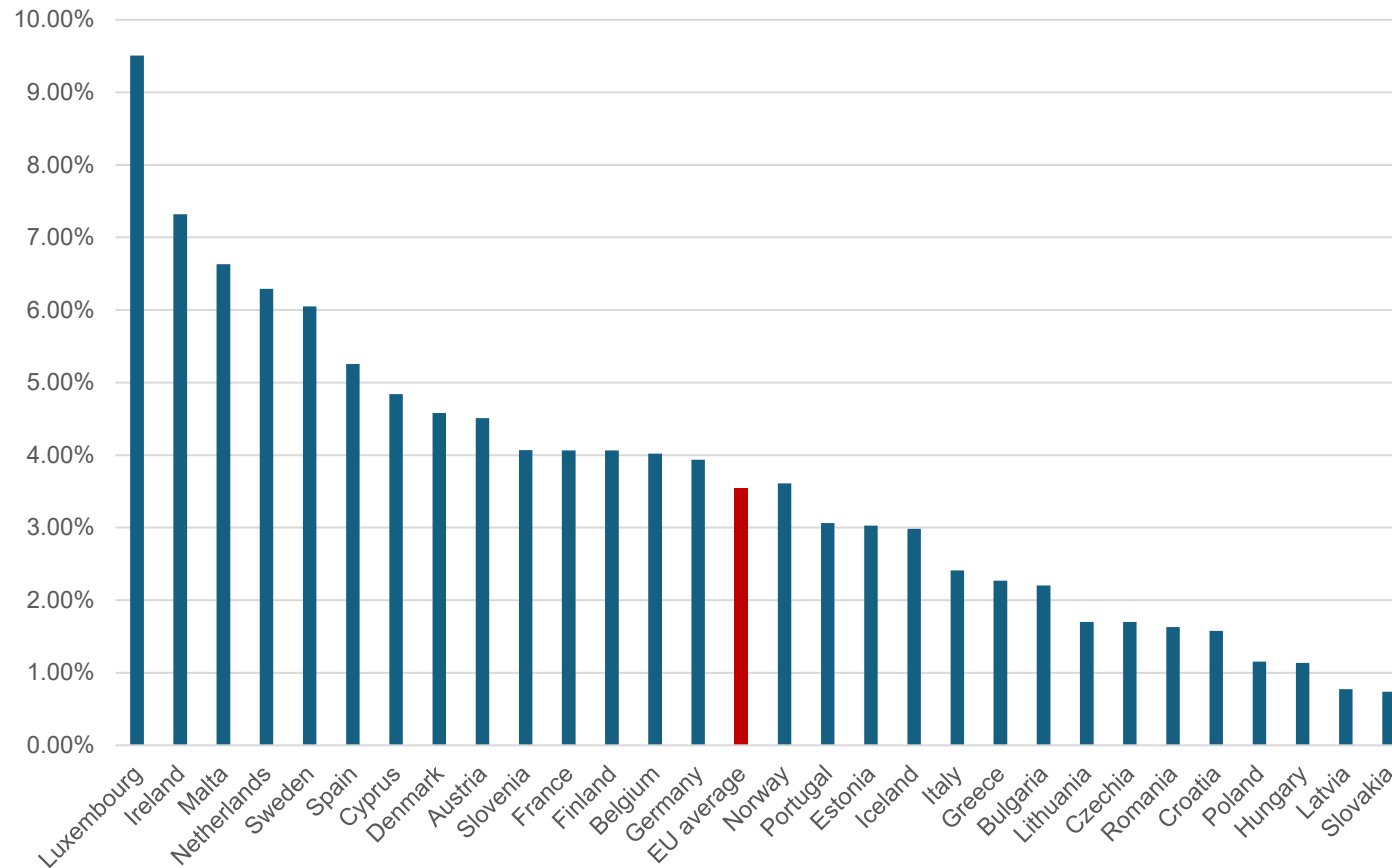
The overall EU + UK share of jobs estimated to be **potential skill shortages** stands at around **2 per cent**.



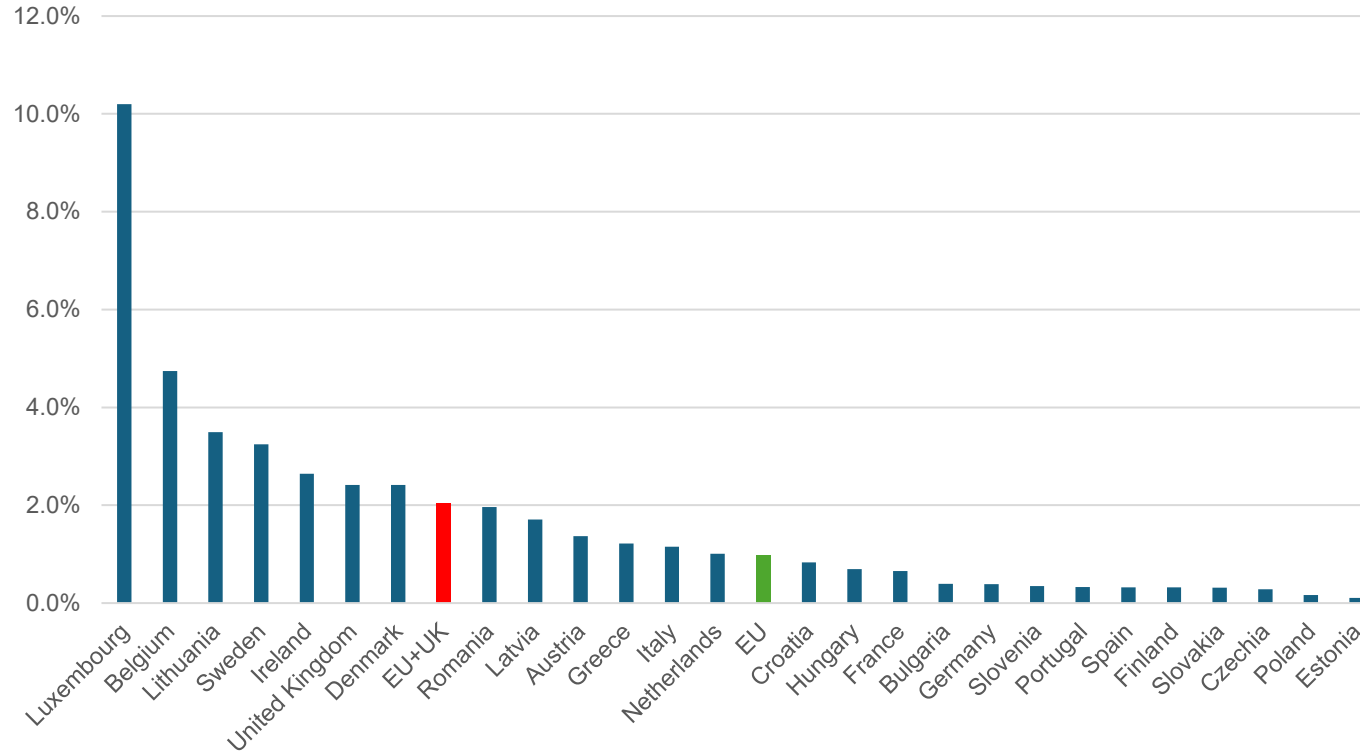


- We validate our Lightcast approach against the ESJS estimates, by calculating the correlation between the potential skill shortages estimates in the two datasets.
- We find a **positive high correlation ($\rho = 0.87$)**: occupations with high (low) shares of potential skill shortages in ESJS data, generally have high (low) rates of potential skill shortages in Lightcast data.
- Important finding: it confirms that our Lightcast approach predicts the vacancies that are likely to be most difficult to fill in a way that is reflective of the current distribution of competencies and skills being demanded, and utilised, in the labour market, as measured by the ESJS.

Incidence of potential skill shortages across countries— ESJS2 - EU 27 + Iceland and Norway



Incidence of potential skill shortages across countries— Lightcast - EU27 + UK



The two sets of estimates are positively correlated ($\rho = 0.60$).



- In the report, we produce estimates with Lightcast data at an EU-level also after 2021. We also introduce a measure of changing skill requirements.
- Ongoing work on refining methodology and creating a composite index.



Thank you for the attention!



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