

Covering gaps in job vacancy statistics using OJAs: a quality assessment

*“Using data from the web to shape next-generation labour market and skills analysis”
Cedefop research conference, 01 April 2025*

Denis Leythienne and Sofie Homa

ESTAT.F.3 – Labour market and lifelong learning

Outline

- Unmet data needs in official statistics
- Potential shortcomings of OJAs
- Quality assessment of OJAs
- Experimental statistics using OJAs
- Conclusions



Unmet data needs in official statistics

- Statistics on **unmet labour demand** published by Eurostat: **Job vacancy statistics**
 - By **country** and by **economic activity**
- BUT unmet needs:
 - no data on **skills**
 - no data by **occupation**
 - no data by **region**
- New source available: OJA
 - Collected from the web (Web Intelligence Hub)
 - Joint Cedefop / Eurostat project
 - Available by occupation (e.g. ISCO 3) and by region (e.g. NUTS 1)
 - Starting from 2019
- Skills as a sub concept of occupations



Potential shortcomings of OJAs

- Multiple counting of OJAs
- Different levels of coverage of web portals across countries
- Different levels of coverage of OJAs across professions



Top 20 occupations - OJAs vs number of employees (SAL)

OJA vs SAL (EU Labour Force Survey), EU27, 2023

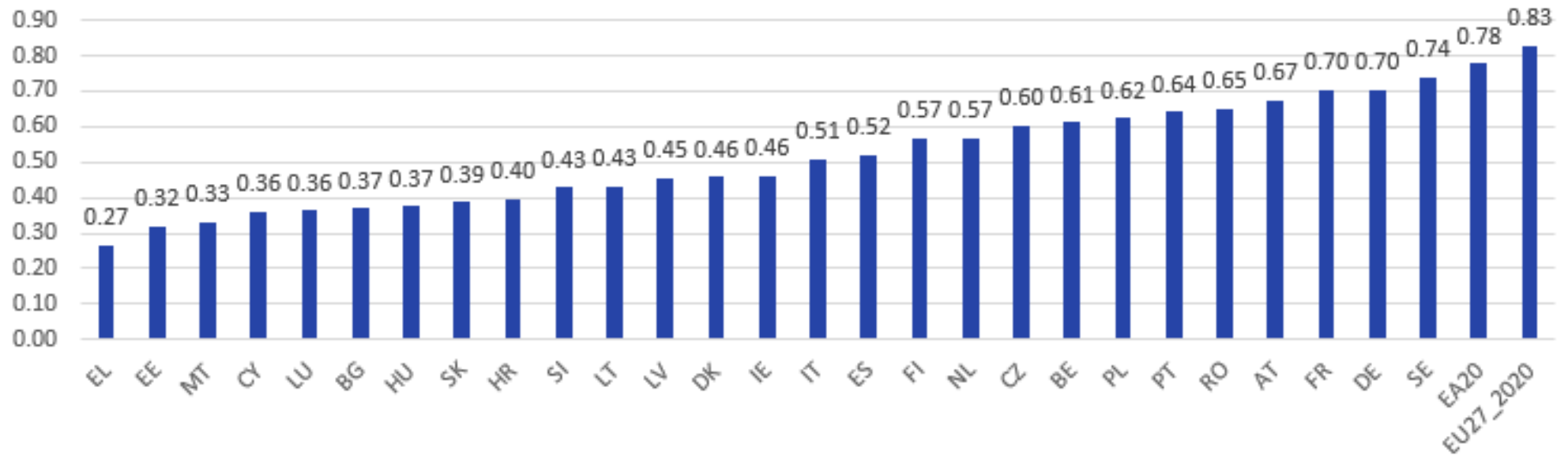
	SAL	OJA
1	Shop salespersons	Software and applications developers and analysts
2	Domestic, hotel and office cleaners and helpers	Engineering professionals (excluding electrotechnology)
3	General office clerks	Manufacturing labourers
4	Primary school and early childhood teachers	Physical and engineering science technicians
5	Personal care workers in health services	Shop salespersons
6	Material-recording and transport clerks	Transport and storage labourers
7	Heavy truck and bus drivers	Sales, marketing and development managers
8	Physical and engineering science technicians	Other clerical support workers
9	Software and applications developers and analysts	Financial and mathematical associate professionals
10	Administration professionals	Sales, marketing and public relations professionals
11	Sales and purchasing agents and brokers	Administrative and specialised secretaries
12	Machinery mechanics and repairers	Client information workers
13	Administrative and specialised secretaries	Sales and purchasing agents and brokers
14	Engineering professionals (excluding electrotechnology)	Administration professionals
15	Protective services workers	Numerical clerks
16	Building frame and related trades workers	Business services agents
17	Secondary education teachers	Domestic, hotel and office cleaners and helpers
18	Nursing and midwifery associate professionals	Electrical equipment installers and repairers
19	Client information workers	Other sales workers
20	Sales, marketing and public relations professionals	Finance professionals



Consistency of OJAs and number of employees (SAL)

OJA vs SAL (EU Labour Force Survey), by country, 2023

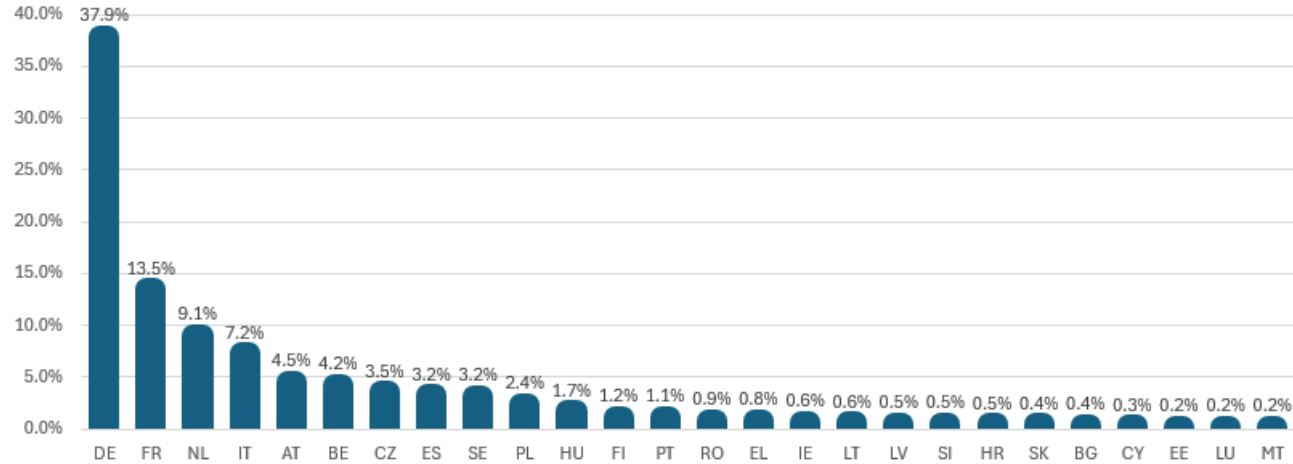
Rank correlation (OJA,SAL) across ISCO 3, 2023



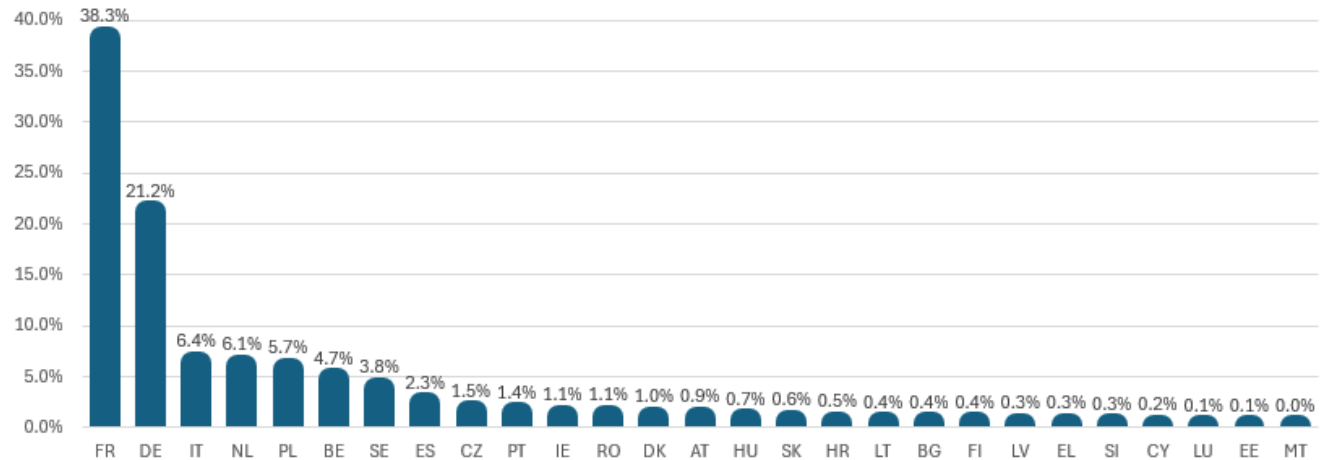
Consistency of OJAs and job vacancies (VAC)

OJA, VAC (job vacancy statistics), by country, 2023

Distribution of VAC by country, 2023



Distribution of OJA by country, 2023



Experimental statistics using OJAs

$$\text{Online Job Advertisement Rate (OJAR)} = \frac{\text{Number of Online Job Advertisements (OJA)}}{\text{Number of Employees (LFS)}}$$

- Data source – OJAs: Web-scraping by the Web Intelligence Hub (WIH)
- Data source – Number of employees: EU Labour Force Survey (EU-LFS)
- Expresses labour demand by occupation (ISCO 3) & by region (NUTS 1)



Stability by occupation over time

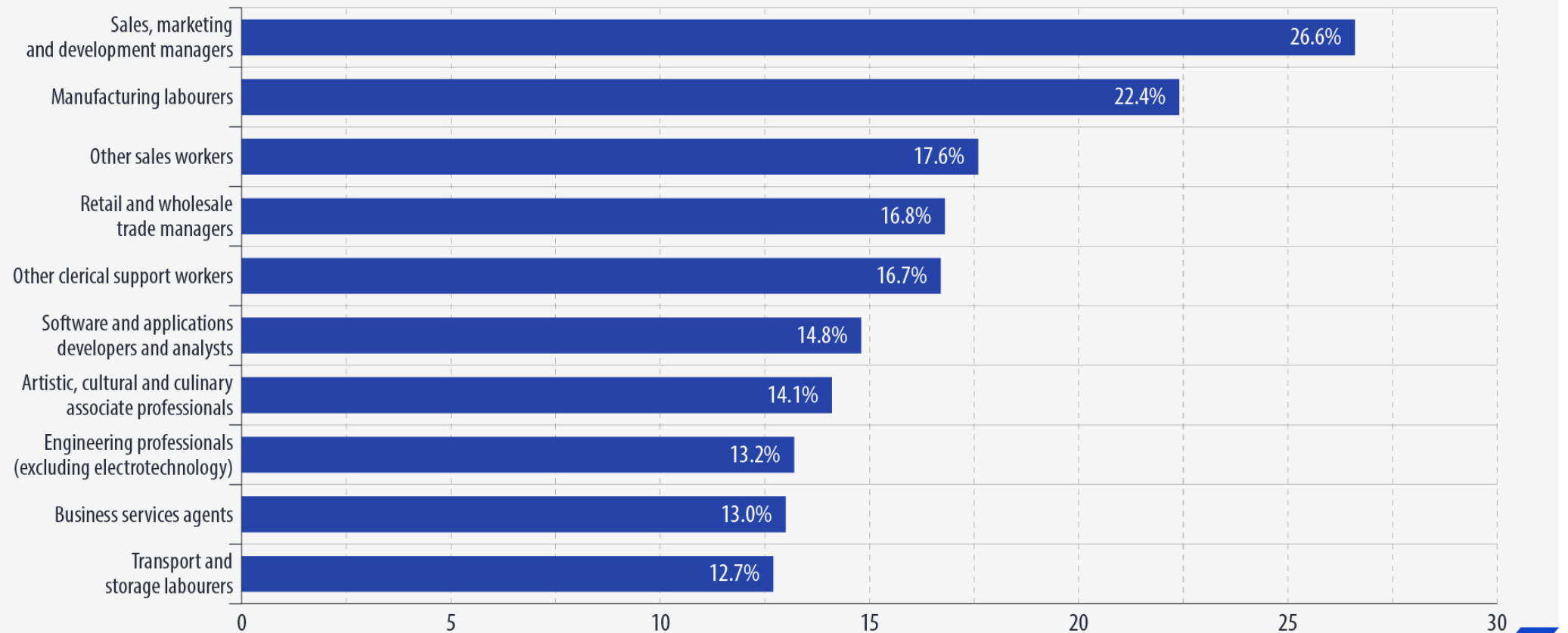
OJAR, EU27, 2019 - 2023

ISCO08 (Labels)	2019	2020	2021	2022	2023	-
Sales, marketing and development managers	1	1	1	1	1	1
Manufacturing labourers	7	3	2	5	2	2
Other sales workers	10	10	5	2	3	3
Retail and wholesale trade managers	3	5	6	4	4	4
Other clerical support workers	11	12	11	6	5	5
Software and applications developers and analysts	2	2	4	3	6	6
Artistic, cultural and culinary associate professionals	7	8	8	8	7	7
Engineering professionals (excluding electrotechnology)	9	8	9	10	8	8
Business services agents	4	6	7	7	9	9
Street and related service workers	26	21	10	11	10	10
Transport and storage labourers	20	15	13	12	11	11
Managing directors and chief executives	14	11	16	14	12	12
Database and network professionals	5	4	3	9	13	13
Information and communications technology service managers	16	21	13	12	14	14
Other stationary plant and machine operators	24	27	19	22	15	15
Food and related products machine operators	34	25	17	17	16	16
Financial and mathematical associate professionals	20	24	22	18	17	17
Physical and engineering science technicians	18	16	21	21	18	18
Electronics and telecommunications installers and repairers	13	13	20	23	19	19
Numerical clerks	30	29	23	20	20	20

	2019	2020	2021	2022	2023
2019	1.00	0.97	0.96	0.88	0.86
2020	0.97	1.00	0.97	0.91	0.89
2021	0.96	0.97	1.00	0.94	0.92
2022	0.88	0.91	0.94	1.00	0.99
2023	0.86	0.89	0.92	0.99	1.00

Top 10 occupations with the highest online job advertisement rate, 2023

(%)



Conclusion

- Good consistency between OJA and number of employees (SAL) (in terms of ranking)
 - Ranking of some individual ISCOs unplausible (i.e. undercoverage)
 - We consider excluding them from the scope (e.g. primary and secondary school teachers)
 - Users should be informed in that case (via Metadata)
- Good consistency between distribution of OJA and job vacancies across countries
 - Few exceptions to be investigated further (France)
- Ranking of occupations in terms of online job advertisement rate stable over time
- OJA shares can be used, not absolute levels



Thank you



© European Union 2025

Unless otherwise noted the reuse of this presentation is authorised under the [CC BY 4.0](https://creativecommons.org/licenses/by/4.0/) license. For any use or reproduction of elements that are not owned by the EU, permission may need to be sought directly from the respective right holders.

