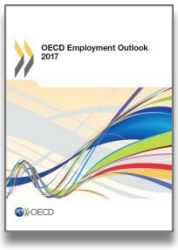

The 2017 edition of the OECD Employment Outlook provides an international assessment of recent labour market trends and short-term prospects. It also contains chapters on: benchmarking labour market performance based on the new OECD Jobs Strategy scoreboard; labour market resilience in the wake of the global crisis; the role of technological change and globalisation in transforming labour markets; and key country differences in collective bargaining arrangements.
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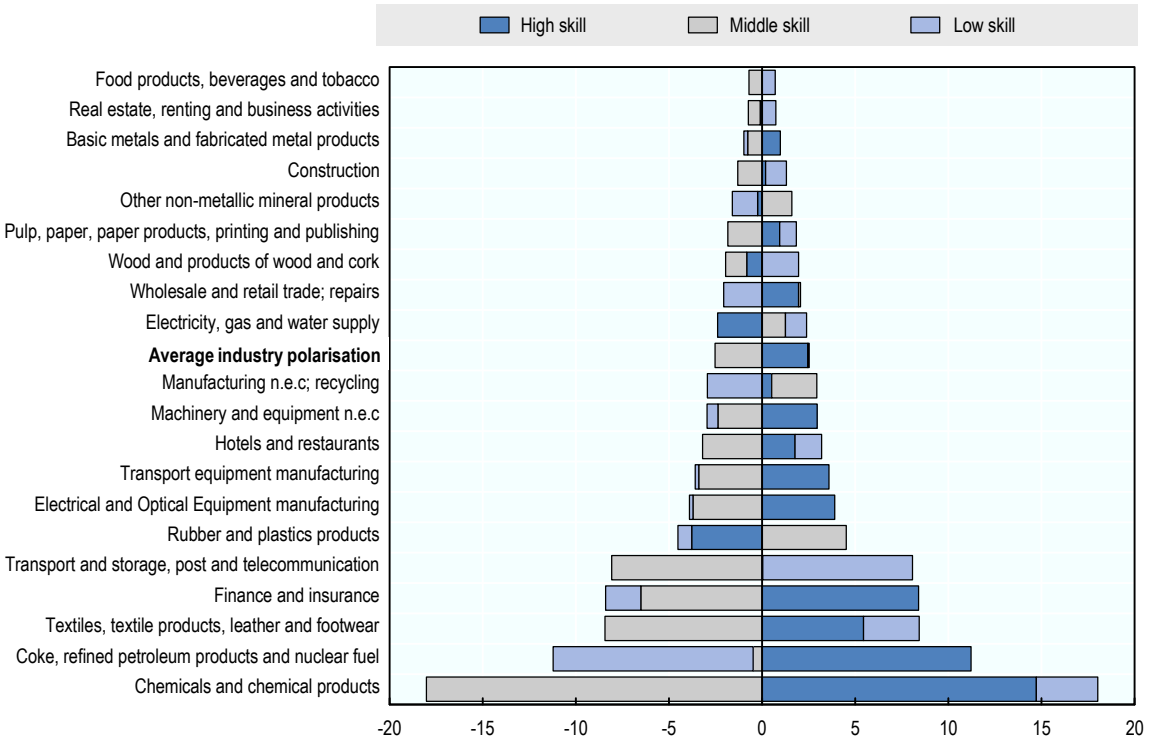
ANNEX 3.A3 – ADDITIONAL EVIDENCE ON POLARISATION BY REGION

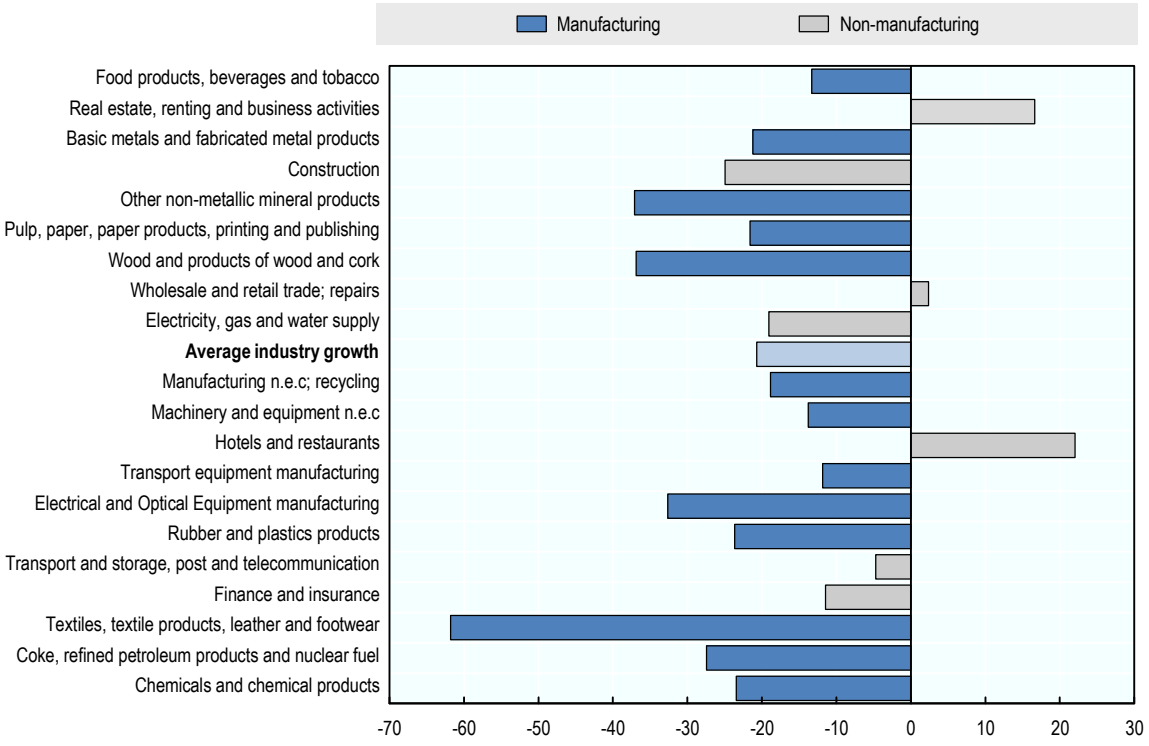
1. This Annex provides additional details on variations in the pattern of within industry polarisation across regions. These additional details supplement the information shown in Figure 3.7 and 3.8 in the body of the chapter.

Figure 3.A3.1. **Regional polarisation patterns**

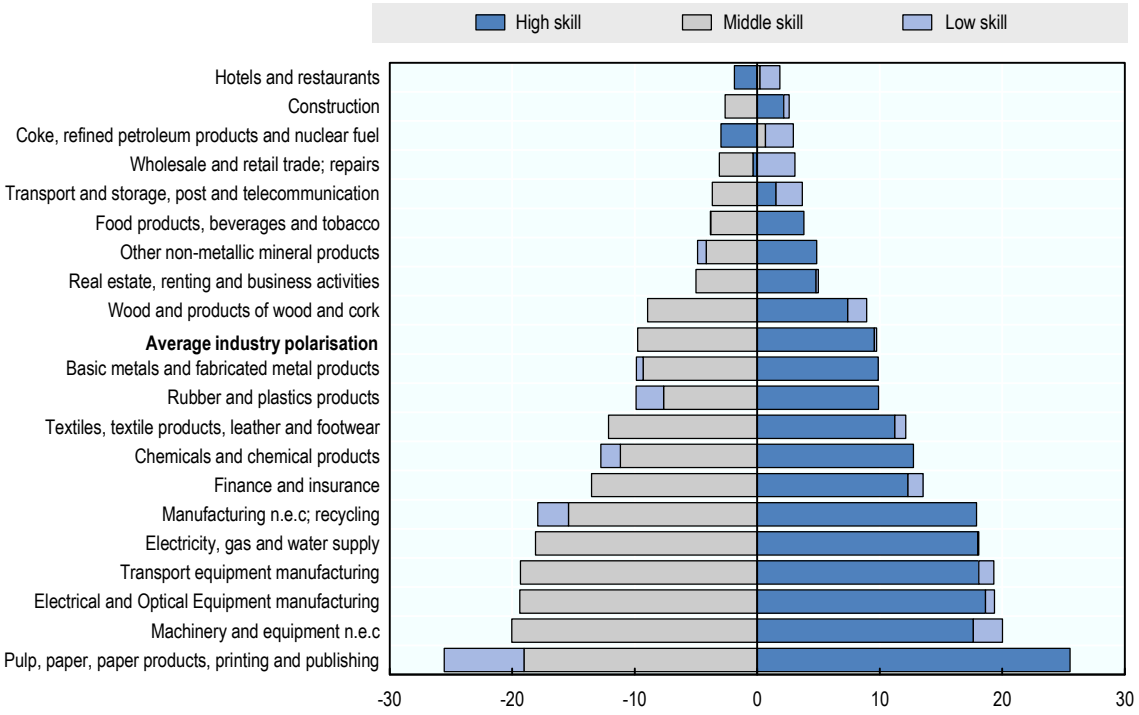
A. Percentage point change in share of total employment within industry, 1995 to 2010[c]; Japan.



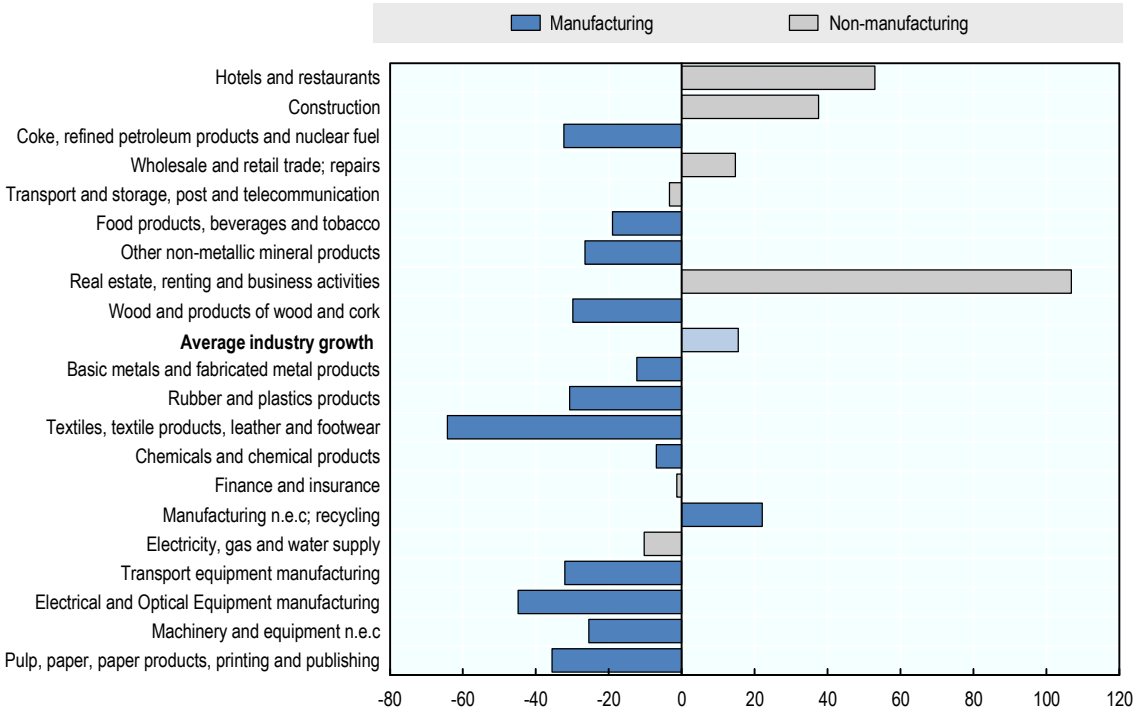
B. Percentage change in total employment within industry, 1995 to 2010[c]; Japan.



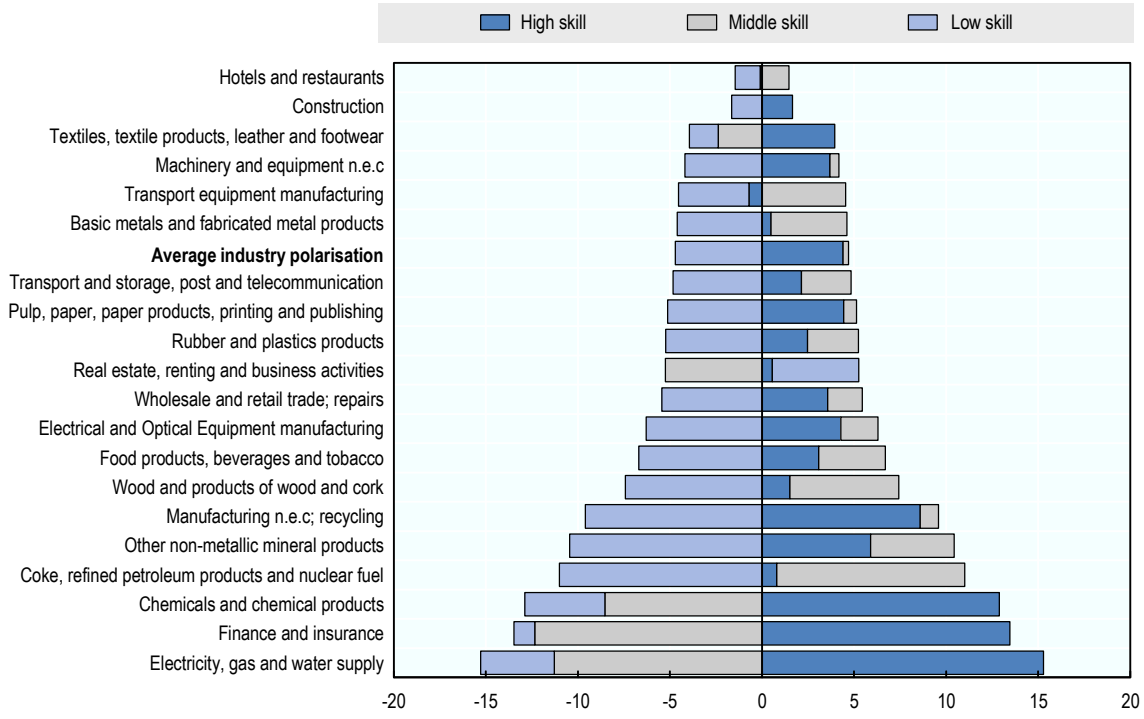
C. Percentage point change in share of total employment within industry, 1995 to 2015 [a]; Northern Europe.



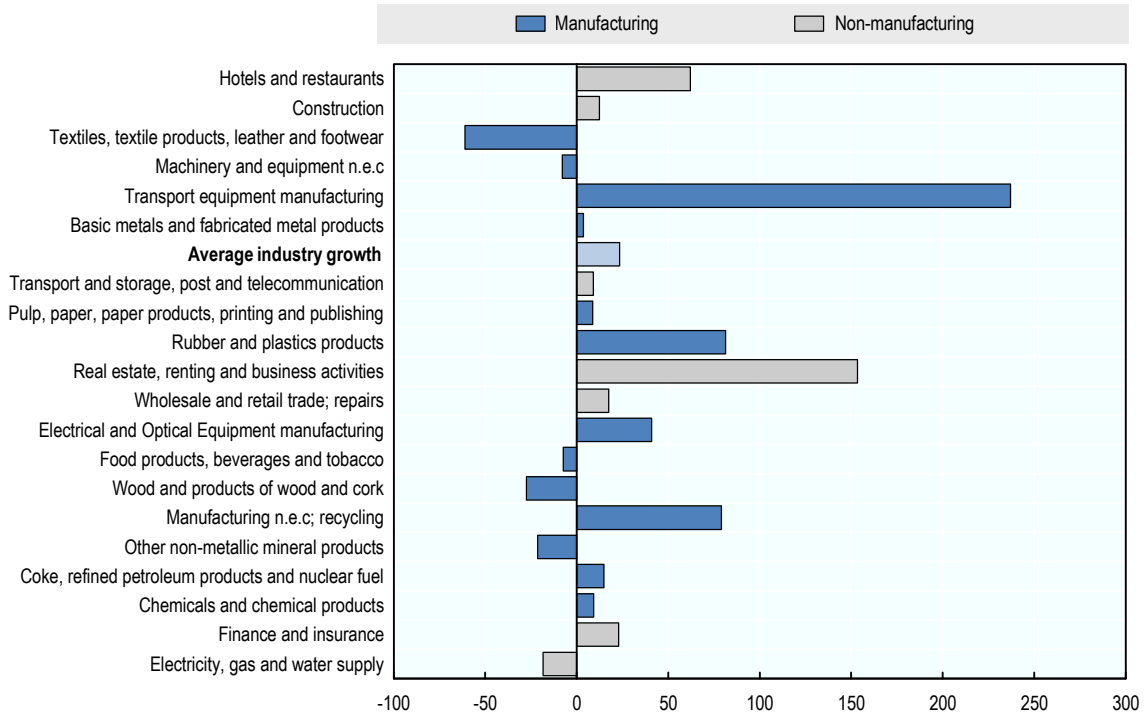
D. Percentage change in total employment within industry, 1995 to 2015 [a]; Northern Europe.



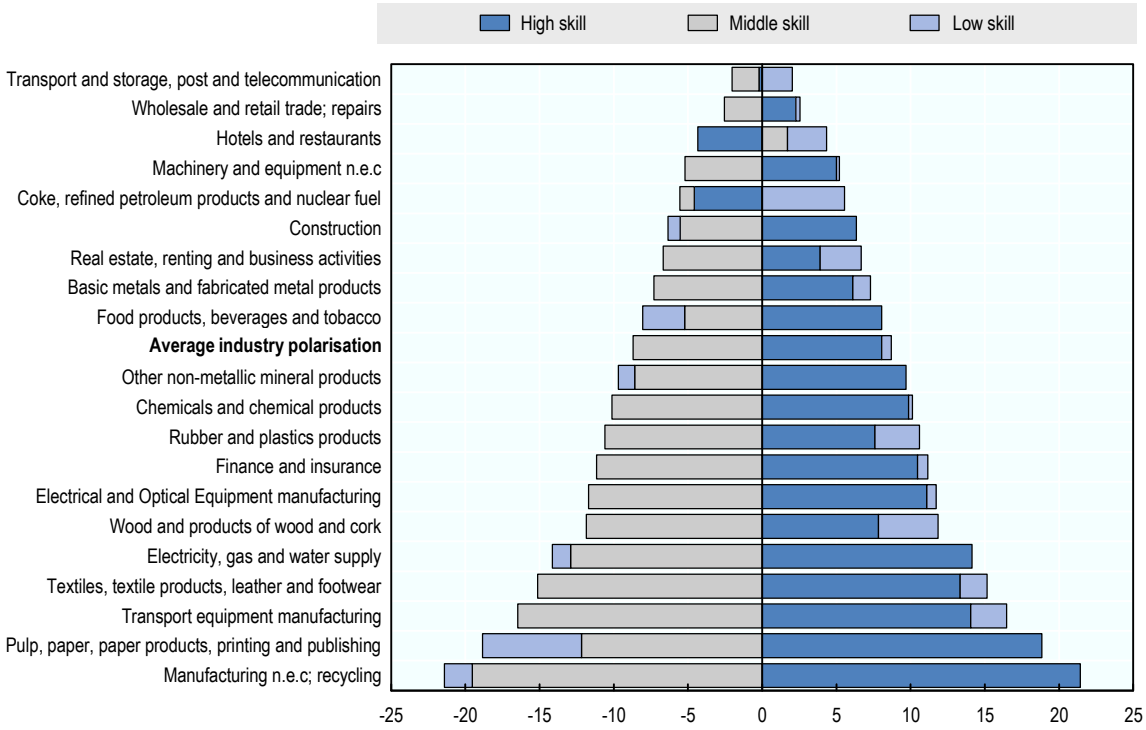
E. Percentage point change in share of total employment within industry, 1995 to 2015 [a]; Central Europe.



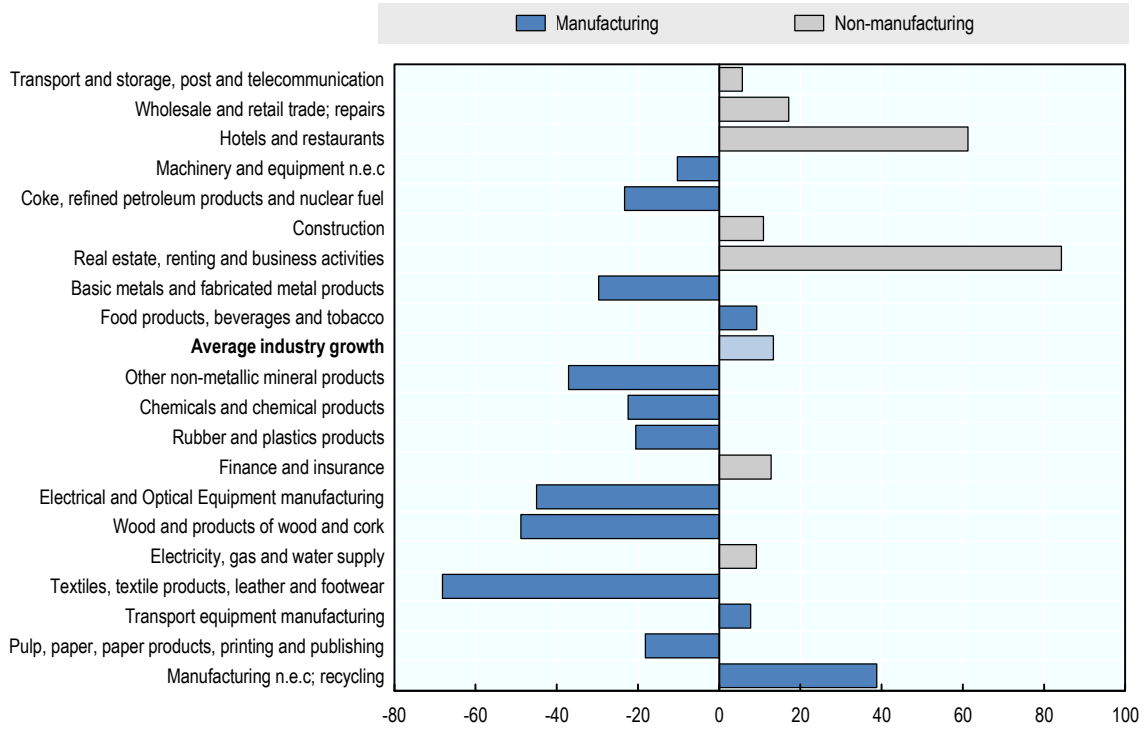
F. Percentage change in total employment within industry, 1995 to 2015 [a]; Central Europe.



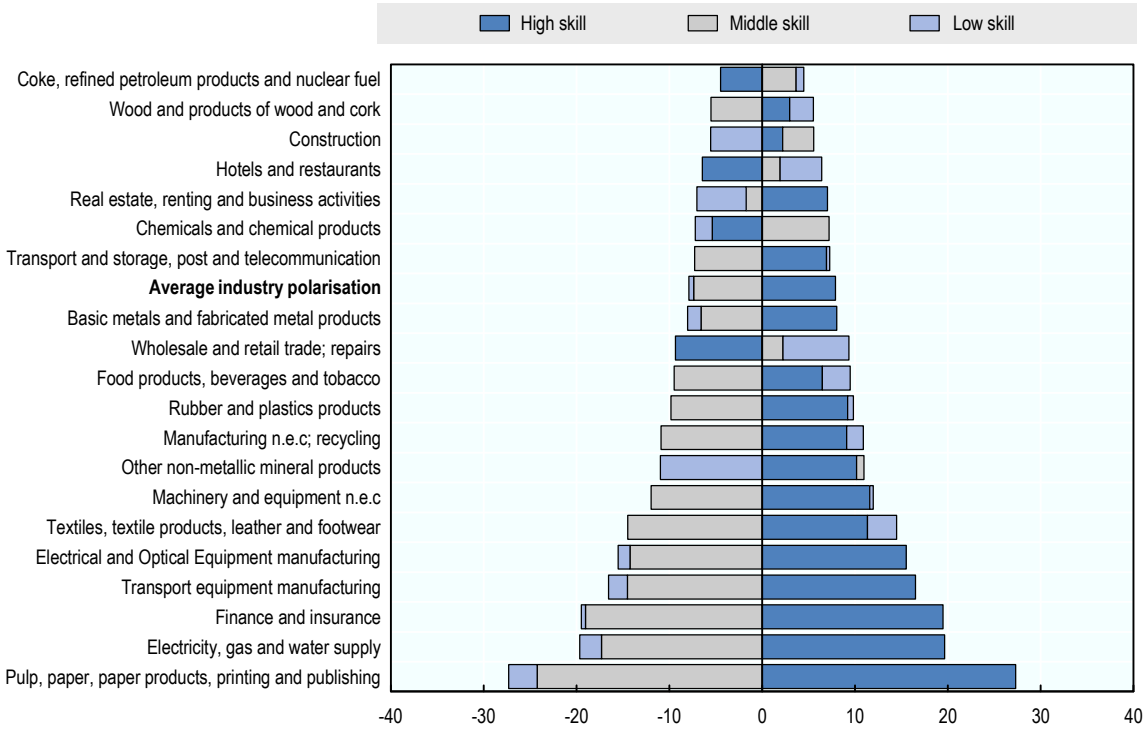
G. Percentage point change in share of total employment within industry, 1995 to 2015 [a, d]; Western Europe.



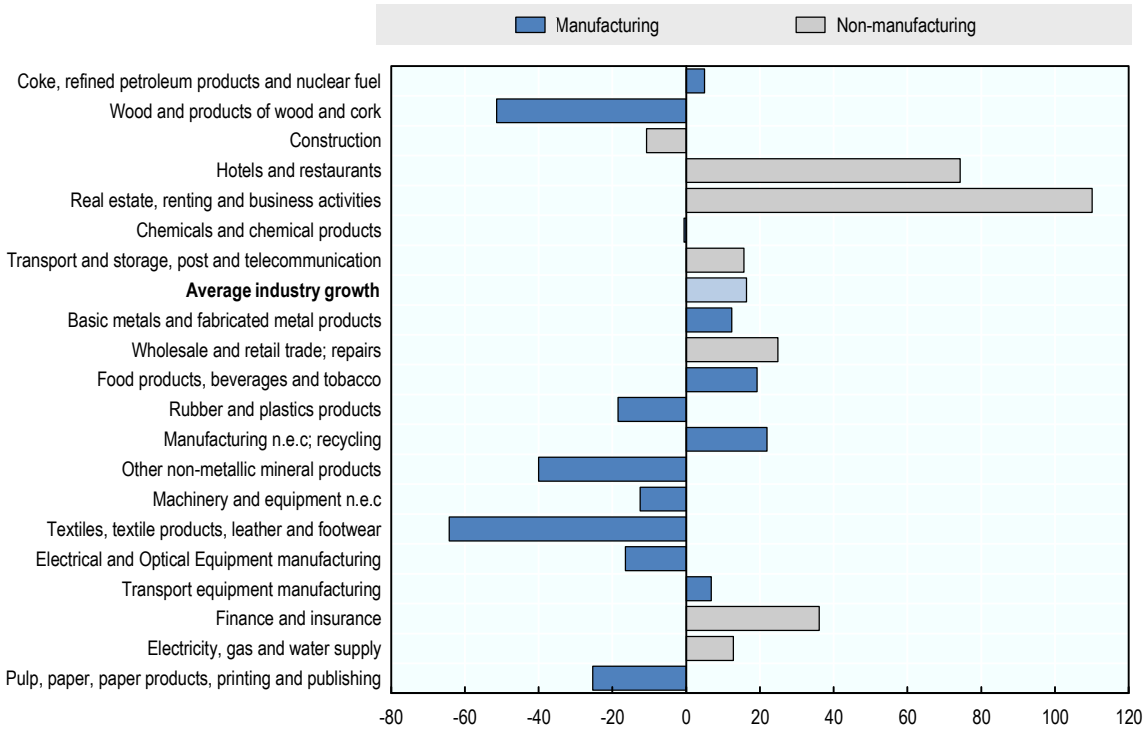
H. Percentage change in total employment within industry, 1995 to 2015 [a, d]; Western Europe.



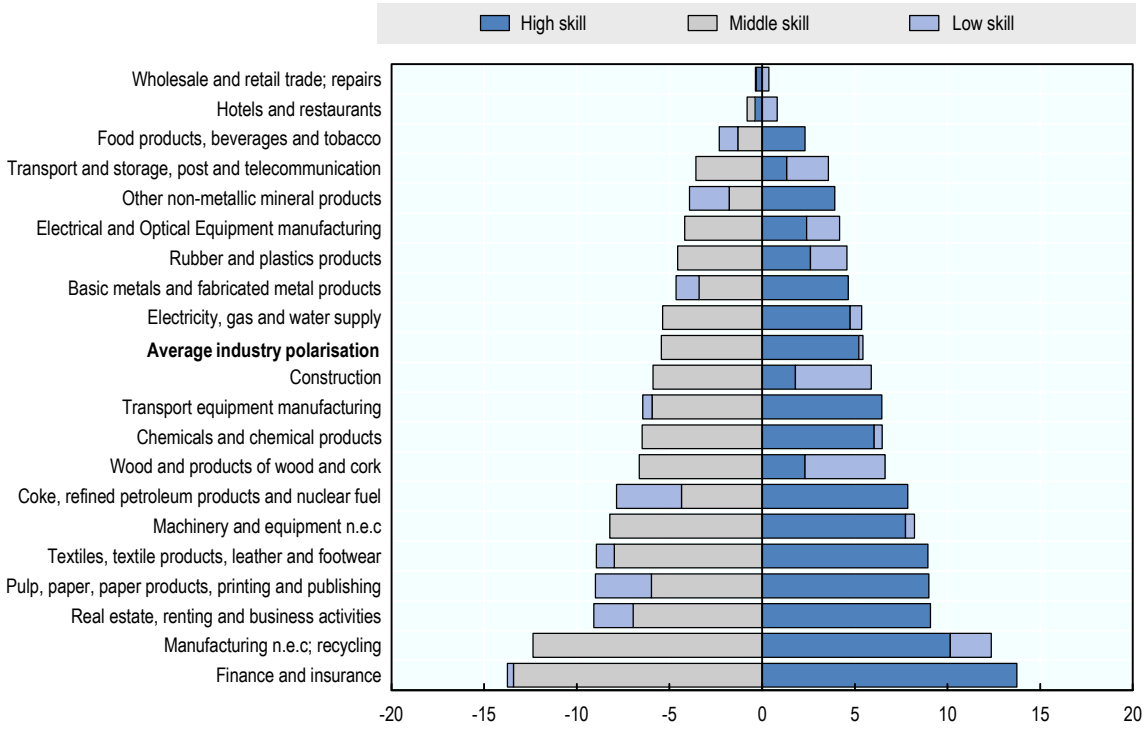
I. Percentage point change in share of total employment within industry, 1995 to 2015 [a, d]; Southern Europe.



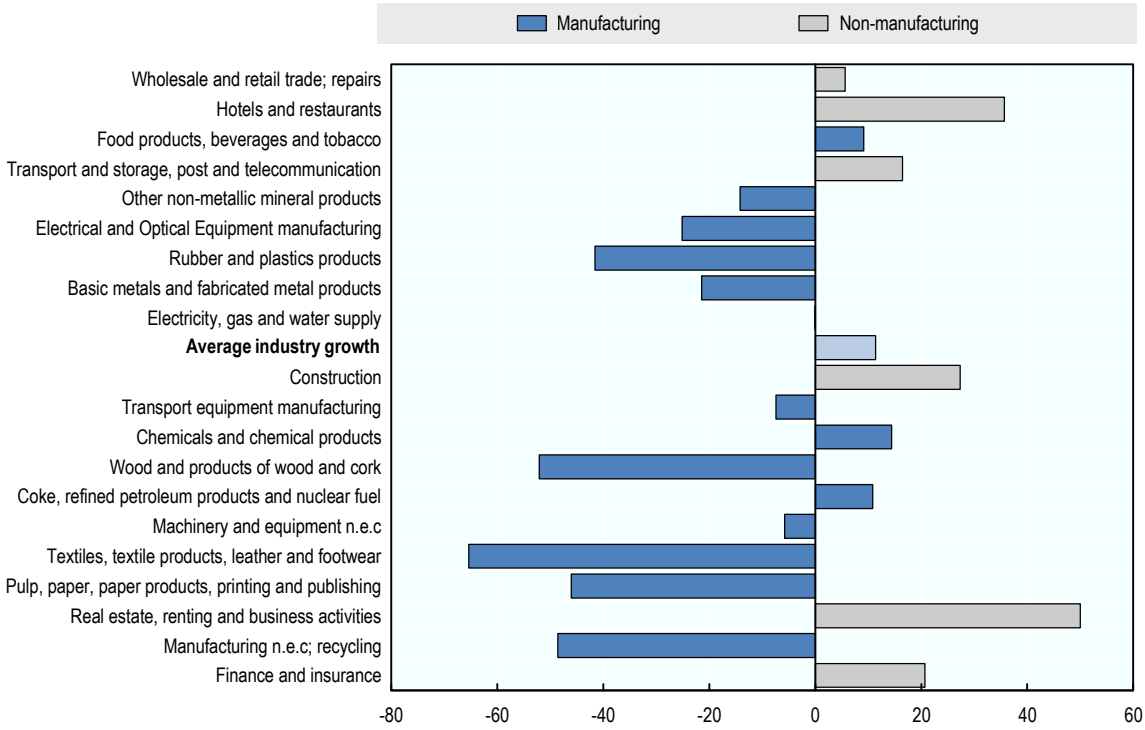
J. Percentage change in total employment within industry, 1995 to 2015[a,d]; Southern Europe.



K. Percentage point change in share of total employment within industry, 1995 to 2015[b, c]; North America.



L. Percentage change in total employment within industry, 1995 to 2015[b, c]; North America.



Note: **Panels A, C, E, G, I, and K:** The figures show changes in the share of low, middle and high skill jobs (by two-digit ISIC Rev.3 classification) within each industry across specified countries. The results are obtained by pooling together employment in each industry across all the countries analysed. The average industry polarisation is a simple un-weighted average of changes in the shares of low, middle, and high skill jobs across industries. **Panels B, D, F, H, J, and L:** The figures depict percentage changes in total employment by industry. The results are obtained by pooling together employment in each industry across all of the countries analysed. The average industry polarisation (light blue) is a simple un-weighted average of changes in total employment across industries.

Panels C and D: Northern Europe contains Denmark, Finland, Norway, and Sweden. **Panels E and F:** Central Europe contains the Czech Republic, Hungary, the Slovak Republic, and Slovenia. : **Panels G and H:** Western Europe contains Austria, Belgium, Germany, France, Ireland, the Netherlands, and the United Kingdom. : **Panels I and J:** Southern Europe contains Spain, Greece, Italy and Portugal. **Panels K and L:** North America consists of Canada and the United States.

a) European employment data beyond 2010 was mapped from ISCO-08 to ISCO-88 using a many-to-many mapping technique. This mapping technique is described in the Annex 3.A4 (online). Data for Japan covers the period 1995 to 2010 due to a structural break in the data in 2010.

b) Employment data by occupation and industry for the United States prior to 2000 were interpolated using the occupation-industry mix for the years between 2000 and 2002, and matched with control totals by occupation and by industry for the years 1995 to 1999.

c) Employment data for Canada, Japan, and the United States were transposed from the respective occupational classifications (SOC 2000 for the United States and Canada and JSOC Rev.3 for Japan) into corresponding ISCO-88 classifications.

d) Employment data was adjusted to correct for structural breaks in the following countries: Portugal (1998), the United Kingdom (2001), France (2003) and Italy (2004).

Source: European Labour Force Survey, Labour force surveys for Canada (LFS), Japan (LFS), and the United States (CPS MORG).

ANNEX 3.A4 – BRIDGING THE ISCO BREAK

1. Motivation

2. This Annex provides a brief description of the method used to reconcile two versions of the International Standard Classification of Occupations (ISCO), ISCO-88 and ISCO-08.

3. The advent of a new ISCO occupational classification (ISCO-08) in 2011 introduced many changes to the classification of occupations compared to the previous version (ISCO-88). As a result, there is a structural break between data prior to 2011 and the data after that year.

2. Potential solutions

4. A natural solution, and one used by the Bureau of Labor Statistics (BLS) in the United States when there was a change in the occupational classification at the turn of the century, is to double code individuals under both systems. This allows for a mapping from one classification into another, under the assumption that the distribution of jobs during double-coded periods is a good proxy for the distribution out of sample (that is, in years where there was no double coding). This assumption is not likely to be valid during all periods, but can be safely assumed to be valid for at least the number of periods in which there is double coding. For example, if there are three years in which individuals were double coded, it seems plausible that the distribution of jobs would remain stable out of sample for three years, provided that the distribution during double coded years was itself stable.

5. However, there are no double coded years within the EULFS dataset, and thus it was necessary to search for a second best solution. One potential approach is to use longitudinal data and examine those individuals that have retained their jobs over the period of the beak. By examining the pattern of reclassification within this subset of repeatedly surveyed individuals, it would be possible to obtain a mapping similar to the double-coding approach. Unfortunately, while the EULFS has some longitudinal aspects (that is, repeated sampling of individuals), the data is actively anonymised to ensure that individuals are not identifiable. This makes it difficult to employ a panel data approach.

6. A third best approach is to identify matching individuals before and after the break on the basis of their observable characteristics, and examine how their classification changes. By examining matching observations that appear to represent the same individual and then restricting the sample to only those matches that correspond to the list of valid ISCO-88 to ISCO-08 pairings, it should be possible to obtain a sense of the distribution of the many-to-many mapping between the classifications. This is the approach undertaken here.

3. Methodology

7. The EULFS database contains a number of variables that identify various characteristic of a person. These characteristics can either relate to the people themselves (e.g. gender, nationality), or they can relate to their jobs (e.g. occupation, hours worked). Some of these variables can vary from one period to another, while others are constant over time.

8. To obtain a match between two people observed on either side of the ISCO break, we examine individuals that had the same value for the first quarter of 2011 as they did in the fourth quarter of 2010 in the following EULFS variables[1]:

- Household sequence number,
- country,
- region,
- country of place of work,
- region of place of work
- degree of urbanisation,
- sex,
- age,
- nationality,
- ILO work status,
- Full-time or part-time indicator,
- 1-digit industry code,
- usual hours worked,
- year in which person started working in their current occupation,
- the existence of more than one job or business,
- professional status,
- professional status (in the second job),
- highest level of education obtained,
- and the age at which person last established their usual residence in the country.

9. The list only contains time-invariant characteristics (for example, sex), or variables that are unlikely to change over the course of a quarter. This procedure reduces the universe of EULFS participants to those who are employed and have a matching observation on the other side of the break..

[1] The variable names as the appear in the database are as follows: hhseqnum, country, region, degurba, sex, age, national, stapro, countryw, regionw, ystartwk, ftpt, hwusual, exist2j, stapro2j, ilostat, hatlev1d, nace1d, ageresid.

10. Effectively, using this process the number of observations shrinks from approximately 1.6 million to 225,891. An additional filter is applied to reduce the probability of including unintended individuals. This filter removes those matched individuals that had grossly different weighting coefficients in the two quarters (a difference of plus or minus fifty percent), since such dissimilarity in weights indicates the two observations are highly unlikely to representing the same person. This filter removes 13,760 observations.

11. Initial attempts to produce a valid mapping applied an additional filter that verified if the observed classification change from ISCO-88 to ISCO-08 was valid based on the theoretical mapping between the two classifications. However, in practice, this filter did not produce improved results. This suggests that the actual mapping of the ISCO break does not adhere exactly to the theoretical mapping available on the website of the International Labour Organization (ILO).[2]

12. The filtering process provides sufficiently large sample sizes to develop individualised mappings by country. Notable exceptions are Belgium, Germany, Luxembourg, and Slovenia. For these countries we obtain a small number of matches relative to the available sample size (less than 10 percent), and we are forced to rely on the mappings we obtain from a cluster of similar countries. Countries were divided into four clusters, which were determined using a K-means clustering technique with correlational linkage based on the distribution of occupations at the 1-digit level. For Slovenia, the cluster included Austria, Italy, Hungary, Slovakia, and the Czech Republic. For the remaining exceptional countries, the cluster included Cyprus, Denmark, France, and the Netherlands.

13. The output of this procedure is a dataset of paired observations across the structural break. Within a single entry of this dataset, an observation after the break can be thought of as a reasonable approximation for the worker before the break. A complete mapping is obtained by summing the population weights of all the individuals corresponding to each combination of ISCO-88 - ISCO-08 codes.

14. In order to check the validity of the mapping, we compared it to an alternative mapping that is available for Switzerland. We found that in 2015, only 1.4 percent of jobs were classified differently across the two systems at the 1-digit level. For comparison, the same data with no adjustment applied had 13.0 percent of jobs classified differently. While the national classification for Switzerland can be considered as the most appropriate mapping for that country, the strength of the mapping described above is that is allows for a comparison across countries, under a consistent framework.

15. This approach has several limitations. Most importantly, it does not deliver an exact mapping, but only an approximation. Further, it is not possible to determine with certainty that a proposed match is a valid match. However, this process does result in considerable progress in smoothing the breaks that are easily observable between the classifications when no adjustment is applied, albeit at a high level of aggregation.

[2] http://www.ilo.org/public/english/bureau/stat/isco/

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