

Automation and the Upskilling of European Workers

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VENUE

Learning for an AI Workplace?
First insights from CEDEFOP's AI
Skills Survey.

Brussels

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Introduction and Study Objectives

- Understanding the extent to which technology will alter the composition of jobs and the likely associated costs for employers in assisting workers to adjust to technologically driven job disruption is an important question for policymakers.
- In this paper, we use data from the second wave of the European Skills and Jobs Survey (ESJS2) for 29 European countries to address these issues among employees in Europe and, specifically, we attempt to address a number of questions.
 - To what extent are workers experiencing the introduction of new technologies in their main jobs (either digital or machines)?
 - How does the incidence of this technological job penetration vary across European Countries?
 - To what extent is technological change altering job task composition?
 - What are the characteristics of employees most impacted?
 - To what degree does technological driven task changes alter the need for upskilling?

Key Variables used from the Survey

- **D_CHTECH:** Change in the use of technology used at work for the main job (digital and machines). Yes / No.
- **D_CHJOBNEW :** As a result of the new computer programs or software/new computerised machinery you learnt for your main job in the last 12 months, did your job tasks change in any of the following ways?: You now do some different or new tasks Yes / No.
- **D_CHJOBDISP:** As a result of the new computer programs or software/new computerised machinery you learnt for your main job in the last 12 months, did your job tasks change in any of the following ways?: You now do not do some tasks you did before. Yes / No.
- **E_TRAIND:** have you participated in any education or training activities to learn new job-related skills (encapsulates courses, workshops / seminars and on-the-job training). Yes / No.

Technological change and task disruption

Table 1: Definitions of Technological Change Categories

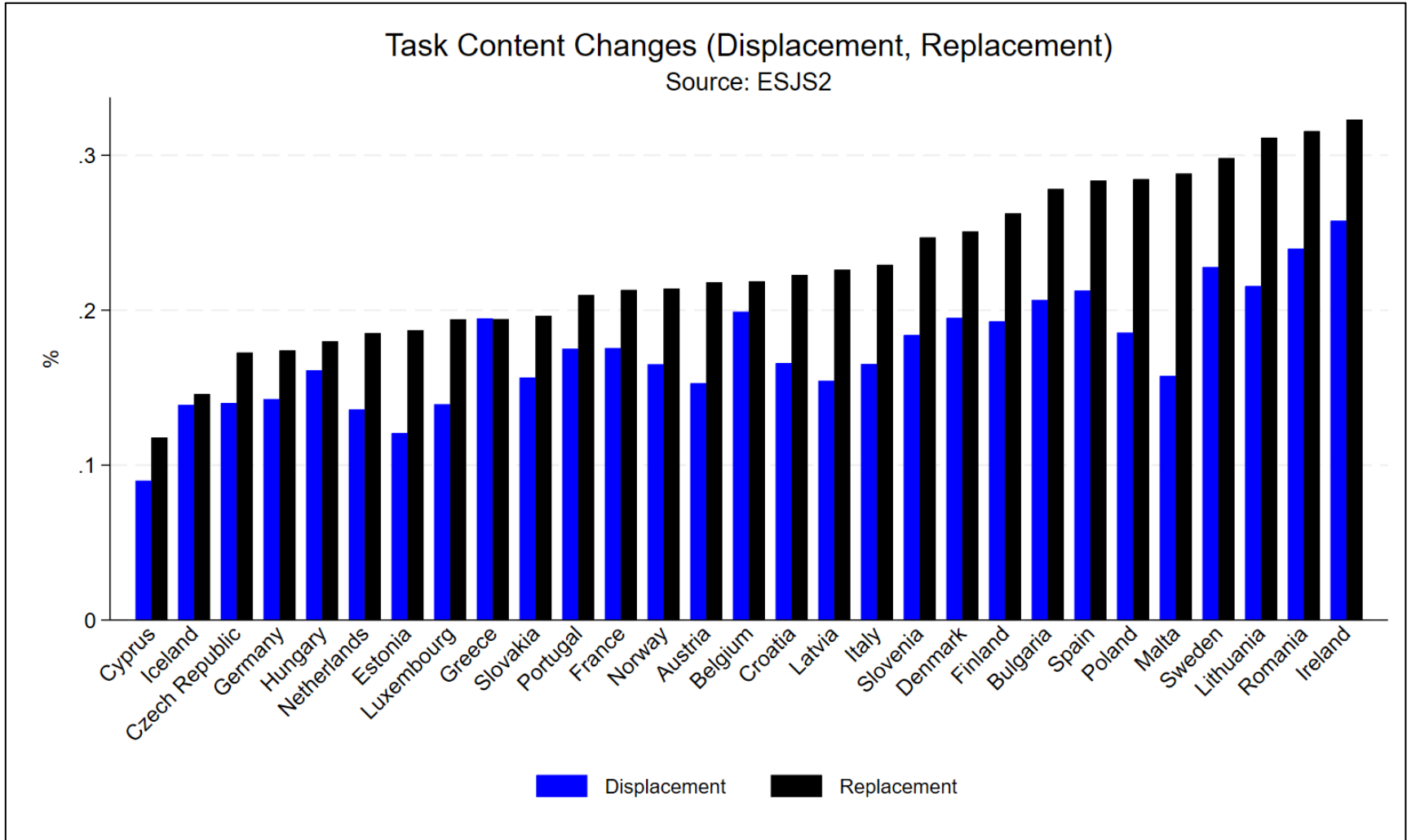
Technological Change Category	<i>There has been a change in the use of technology used at work for the main job (digital or machines).</i>	<i>You now do not do some tasks you did before.</i>	<i>You now do some different or new tasks.</i>
<i>1. No Technological Change</i>	NO	NO	NO
<i>2. Technological Change, No Task Changes</i>	YES	NO	NO
<i>3. Displacement Only</i>	YES	YES	NO
<i>4. Creation Only</i>	YES	NO	YES
<i>5. Displacement & Creation</i>	YES	YES	YES

Technological change categories are derived from variables *D_CHTECH*, *D_CHJOBNEW* and *D_CHJOBDISP*.

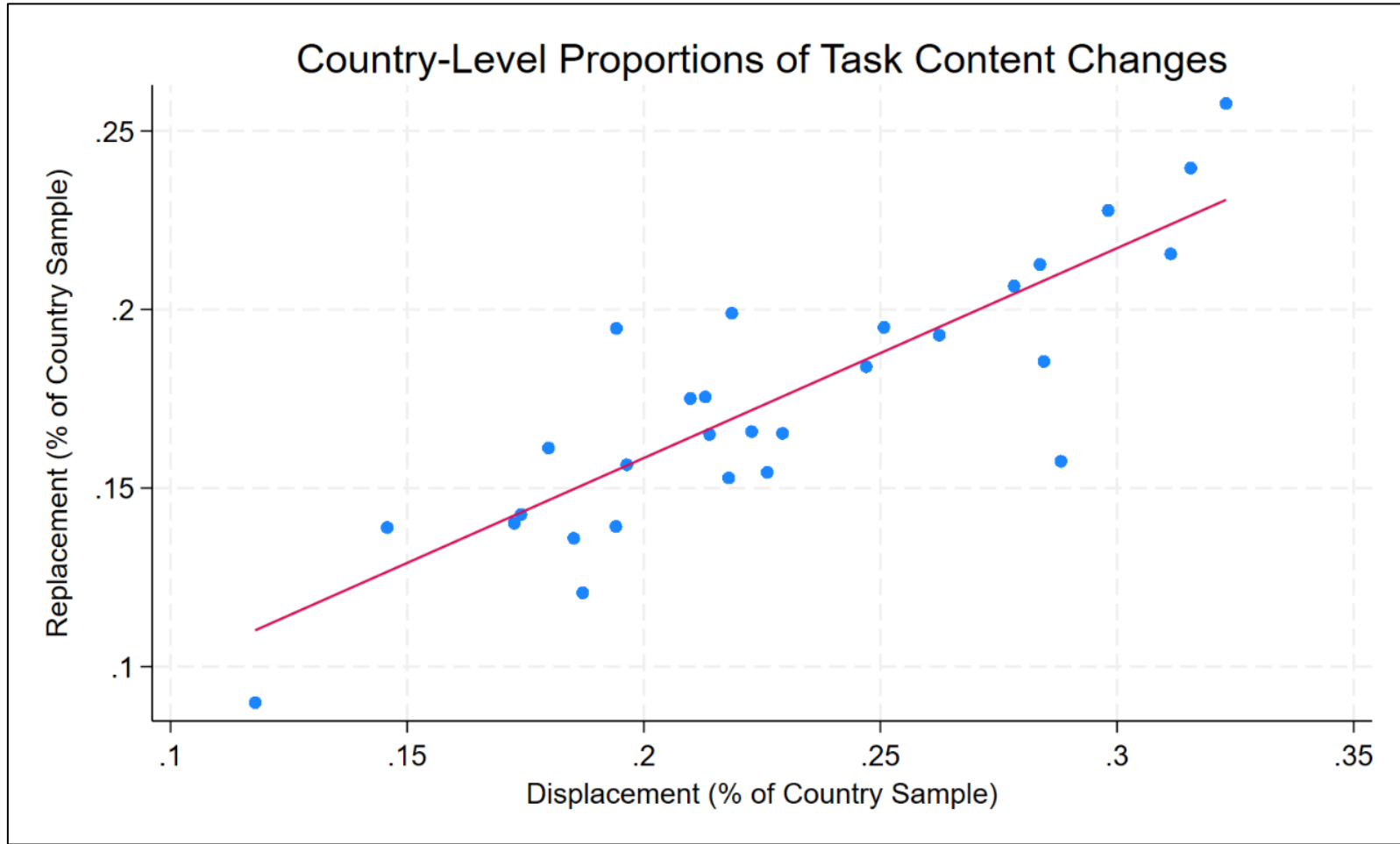
Headline Rates

- 43 (57) per cent of employees report that they have (not) experienced change in the use of new technologies (digital or machinery) within their main jobs.
- An average of 15 per cent of employees reported new technologies resulting in no impact on task composition.
- The average incidence of technological driven task displacement **only** stood at 5 per cent (question marks over previous job automation estimates?).
- An average of 10 per cent of European employee's report experiencing new technologies resulting in task creation **only**.
- Where technological change is present within an employee's main job it is most likely to result in both task creation and task displacement, with an average of 13 per of European employees

International Patterns

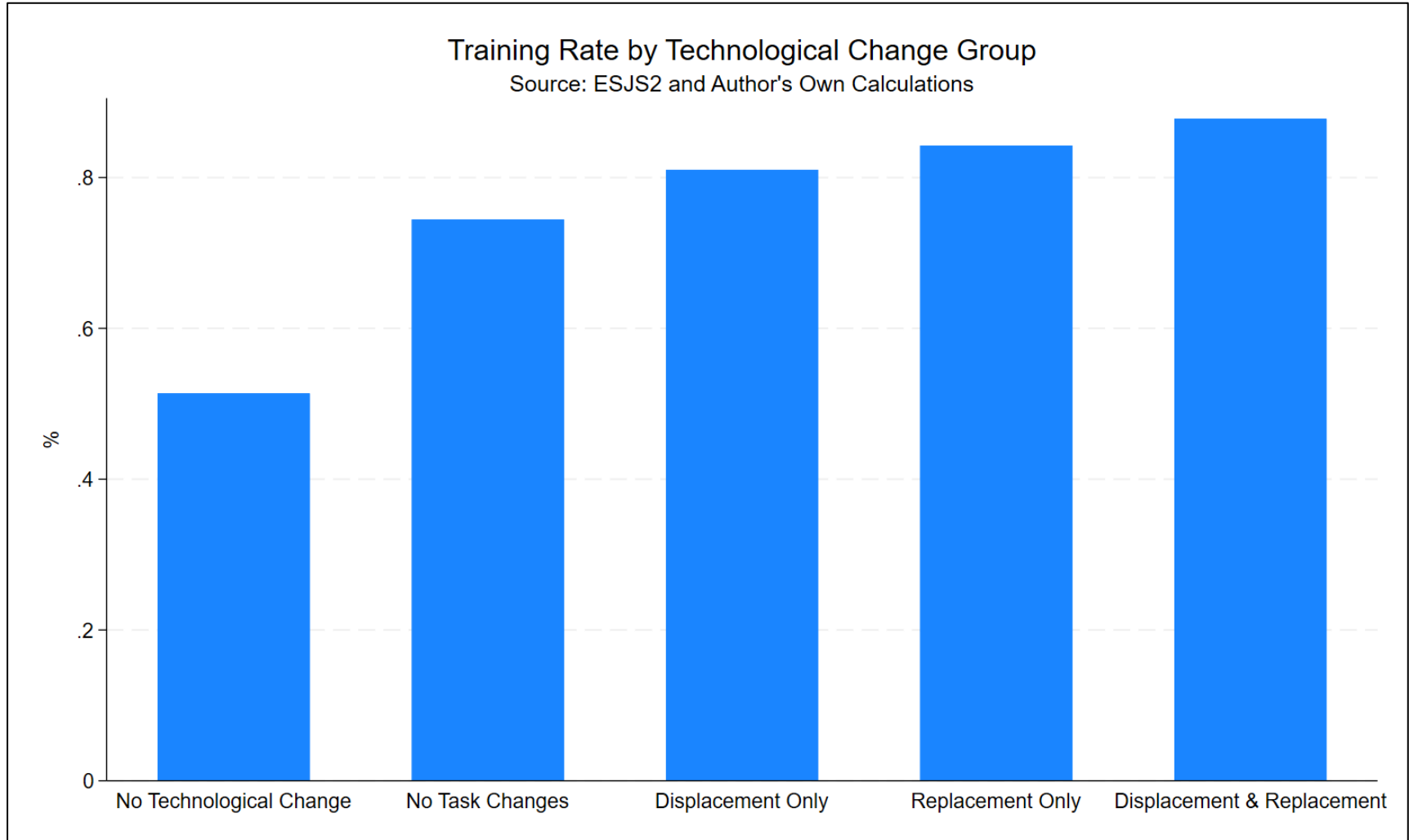


Correlation between Task Displacement and Replacement



- Workers in jobs experiencing technological change are:
 - between 1 and 4 % points less likely to be female.
 - Between 1 and 3 % points less likely to be in jobs with repetitive tasks (also the case where tech leads to task displacement only).
 - Between 3 and 7 % points less likely to be in jobs with more uncertainty (proxy for complexity).
 - Between 5 and 12 % points more likely to be graduates (than workers with only primary qualifications).
 - More likely to have longer tenure and be employed full-time.

Technologically Driven task change and Upskilling



Econometric Estimates

Compared to workers in jobs not impacted by technological change:

- Workers with technological change but **no change** in tasks are 18 percentage points more likely to receive training.
- Workers with technological change and task **displacement only** are 28 percentage points more likely to receive training.
- Workers with technological change and task **creation only** are 30 percentage points more likely to receive training.
- Workers with technological change and **both** task **creation** and task **displacement only** are 36 percentage points more likely to receive training.

Summary I

- The results from the econometric models indicate that, relative to workers in jobs not impacted by new technologies, employees in jobs with new technologies and no task disruption were 18 percentage points more likely to receive job related training.
- The marginal effects, with respect to job-related training, increase substantially with the extent of technological task disruption.
- Employees in jobs where new technologies resulted in both task displacement and task creation were over 30 percentage points more likely to have undertaken job-related training.
- The results suggest a clear role for policy in assisting firms to upskill employees experiencing task disruption as a result of technological change

Summary II

- In terms of technological job penetration, our results indicate that 57 per cent of European employees have experienced no change in the use of new technologies within their main jobs.
- Of the 43 per cent of workers experiencing some technological change, 15 per cent reported no impact on job composition, 5 per cent reported task displacement only, 10 per cent task creation only.
- Where technological change is present within a worker's main job it is most likely to result in both task creation and task displacement, with an average of 13 per cent of European workers reporting this outcome.
- Workers with higher levels of education are over-represented in jobs impacted by technological change. We find no evidence that workers who experienced technologically driven task displacement were more likely to be in jobs with high levels of repetitive tasks.