New Technologies and Jobs in Europe

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Discussion by

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Disclaimer: The views expressed are my own and do not necessarily reflect those of the ECB or the Eurosystem.

Outline

1. Short summary of paper
2. Short discussion of paper
3. Some thoughts on AI and labour markets
4. References
5. A final slide

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Research Question and Approach

Research Question:

- How do new technologies, specifically artificial intelligence (AI) and software adoption, impact employment and wages in European countries?

Approach:

- Examine the exposure of different occupations to AI and software adoption, analysing how these affect employment shares and wages
- Disentangle effects of technology adoption across different skill levels and age groups

Data and Methodology

Data:

- Eurostat's Labour Force Survey: Three-digit occupation-level data from 16 European countries (2011-2019)
- Measures of AI and software exposure from Felten et al., 2018 (occupational impact scores based on advancements in AI applications) and Webb, 2020 (software exposure scores based on patent text analysis and job descriptions)

Methodology:

- Empirical analysis focuses on the relationship between technology exposure and changes in employment shares and wages
- Includes country and sector fixed effects to control for structural differences
- Utilises employment-weighted percentiles to interpret the distributional impact of technological exposure on workers

Main Results

- **Employment Impact:** AI exposure is positively associated with increases in employment shares, particularly in high-skilled occupations and among younger workers. In contrast, software exposure showed weaker effects.
- **Wage Effects:** No significant relationship between AI exposure and relative wage changes, suggesting that AI-driven job growth did not correspond to substantial wage gains.
- **Cross-Country Differences:** Variations in the effects are linked to differences in the pace of technology diffusion, education systems, product market regulations, and labour laws across countries.
- **High-Skill and Age Effects:** High-skilled jobs benefit more from AI exposure, consistent with the complementarity stressed in Skill Biased Technological Change (SBTC) theory.

Outline

Strengths of the Paper

- **Data-based analysis:** One of few available studies that builds on available data, rather than projections (or speculation)
- **Rich dataset:** Utilises detailed, occupation-level data from 16 European countries, allowing for robust cross-country comparisons and sector-specific insights
- **Methodological rigour:** Employs two AI exposure measures increasing robustness, combined with fixed effects to account for structural differences, carefully interpret results by distinguishing between correlation and causation, acknowledging limitations

Limitations of the Paper

- **Alternative hypotheses:** Including (and then dismissing) alternative/intervening drivers of labour market improvements could add additional robustness to results
- **Causation:** While arguing that European institutions and regulation may explain differences to the US, there could be more of an exploration as to how this results in (temporary?) labour market improvements
- **Exclusion of recent AI developments:** Does not account for the latest advancements in AI technologies, such as large language models, which may have significant implications for the labour market

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Jobs are starting to be lost to AI

"BPER Banca said Thursday that it plans to **reduce its workforce by about 2,000 over the coming years as advances in AI boost output**. *The bank will rely on 'AI/GenAI-enabled process optimization and automation' to cut headcount by 10% through 2027 to about 18,500."*

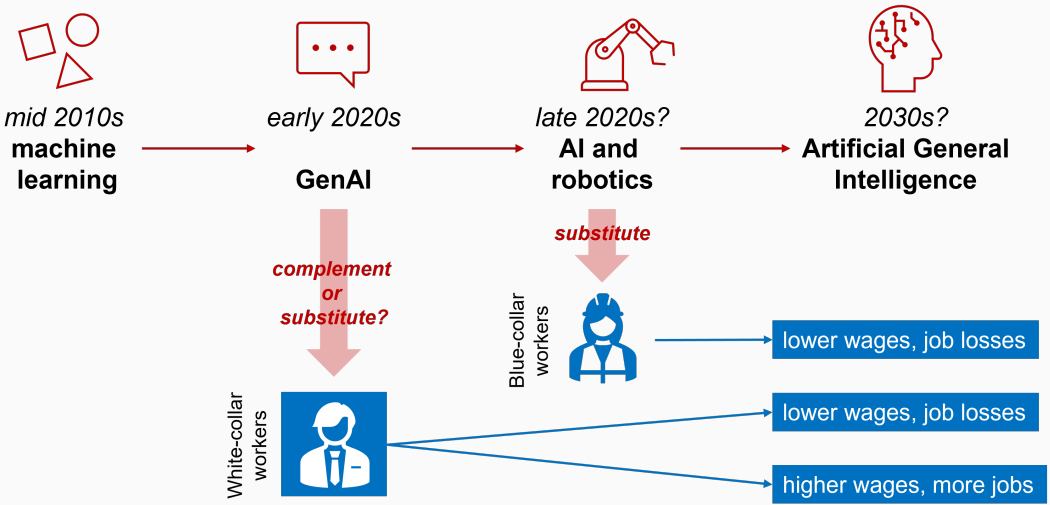
— Bloomberg News, 10 October 2024

Major advances on AI robots expected

"**Given technological progress being made in multi-modal AI and dexterity, [we] conclude that significant growth lies ahead.** *We estimated 1.4bn moving AI Robots could be moving around us by 2035. We extended the analysis to humanoids and forecast 648m units could be working alongside, or for, us by 2050.*"

— *The Rise of AI Robots, CITI Global Insights, 17 October 2024*

AI and the future of the labour market



Implications for policy making

AI and AI robots could displace parts of the white-collar and blue-collar workforce, further **exacerbating inequality and challenge the current economic policy order**.

- **Fiscal policy:** AI may lead to an erosion of the labour tax base, while at the same time increasing welfare expenditure needs (e.g. Brollo et al., 2024)
- **Monetary policy:** High inequality may impede the transmission of monetary policy (e.g. Mian et al., 2021)

Key variables that will determine the impact of AI are **(i) AI diffusion across economic sectors and countries**, as well as **(ii) the regulatory approach taken by governments**.

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- Felten, E., Raj, M., & Seamans, R. (2018).**A method to link advances in artificial intelligence to occupational abilities.** *National Bureau of Economic Research (NBER)*, (24339).
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- Brollo, F., Dabla-Norris, M. E., de Mooij, M. R., Garcia-Macia, M. D., Hanappi, T., Liu, M. L., & Nguyen, A. D. M. (2024).**Broadening the Gains from Generative AI: The Role of Fiscal Policies.** *IMF Staff Discussion Notes*, (2024/002).
- Mian, A., Straub, L., & Sufi, A. (2021).**What explains the decline in r*? rising income inequality versus demographic shifts.** *Proceedings of the 2021 Jackson Hole Symposium*.

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