



АКТУАЛЬНІ ПРОБЛЕМИ СУЧАСНОЇ ЕКОНОМІКИ, МЕНЕДЖМЕНТУ ТА МАРКЕТИНГУ

THE DEMOGRAPHIC CRISIS AND THE FUTURE OF OCCUPATIONS IN THE AGE OF ARTIFICIAL INTELLIGENCE

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The demographic crisis—population ageing and the decline in the number of working-age people—is reshaping labor markets. Across Europe, including Poland, the dependency ratio is rising: fewer workers support more retirees. In parallel, artificial intelligence (AI) is accelerating, automating cognitive tasks. The question is whether AI will deepen job losses or offset labor shortages and support public finances.

A task-based lens is essential. Occupations are bundles of activities: routine (standardizable) and non-routine (context-dependent). Generative AI is taking over part of the routine in offices, finance and administration, placing mid-skill occupations most at risk. Yet ageing societies increase demand for relational work—in health care, care services and education—where empathy and coordination are hard to fully automate. In the short run these forces pull in opposite directions: automation reduces demand for routine, demography strengthens demand for social tasks. Evidence from earlier waves of automation points to skill-biased technical change: demand rises for analytical and digital skills and falls for routine ones. In industry and logistics this role is played by collaborative robots; in services, by process automation (RPA) and large language models.

At the macro level, AI can compensate for a shrinking labor supply through productivity gains. If productivity grows faster than the number of workers declines, GDP per capita can remain on a growth path, easing pressure on pension and health systems. The precondition is diffusion: productivity gains must fund human capital and data infrastructure rather than accrue solely as owner rents. Otherwise, income and regional polarization intensify, weakening social cohesion.

At the micro level, the risk of “occupations disappearing” is smaller than that of “roles transforming.” AI decomposes occupations into tasks and

recombines them: the accountant becomes a data curator and guardian of compliance; the teacher—a designer of learning pathways; the physician—a manager of algorithm-supported decisions. The most valuable capabilities are complementarities: problem framing, critical appraisal of sources, interpretation, and ethical accountability. Where tasks are highly structured, automation dominates; where judgment and relationships matter, human work is augmented.

The risks are real. First, a skills shock: some workers aged 50+ have poorer access to training and lower propensity to adopt AI, risking labor-market exclusion. Second, model fallibility (hallucinations, bias) can generate systemic errors in critical sectors, with responsibility often diffuse. Third, the centralization of data and compute encourages concentration of technological rents, limiting competition and local innovation.

How to respond? On the state side: (1) lifelong learning—micro-credentials, vouchers and reskilling for vulnerable groups; (2) active ageing—flexible hours, digital ergonomics and “returnship” programs; (3) selective immigration and internal mobility in shortage sectors; (4) quality and audit standards for AI, including human oversight in high-risk processes and data transparency. On the firm side: task-centric job design, investment in human-in-the-loop tools, and productivity metrics that capture quality and safety, not just speed.

The conclusion is cautiously optimistic. The demographic crisis and the spread of AI form a coupled adaptive system. If AI is used to automate routine and to strengthen work in care and education—while ensuring inclusive learning and robust oversight—the technology can become an instrument of demographic stabilization. Otherwise, what was meant to offset labor shortages may amplify exclusion and polarization. The stake is not the “end of work” but a new architecture of occupations in which judgment, empathy and responsibility work in concert with machine computation.

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