



AUTOMATION AND THE EMPLOYMENT PARADOX: OECD EXPERIENCE

Shokirova Gulrukhbonu Bekhzod kizi

Master's student, Department of World Economy

University of World Economy and Diplomacy, Tashkent

e-mail: gulruhshokirova2003@gmail.com

+998330630290

Scientific supervisor: Dr. Umida Sharipova

Head of the International Finance and Investments Faculty

University of World Economy and Diplomacy, Tashkent

e-mail: usharipova@uwed.uz

<https://doi.org/10.5281/zenodo.16964915>

ARTICLE INFO

Qabul qilindi: 5-avgust 2025 yil

Ma'qullandi: 12-avgust 2025 yil

Nashr qilindi: 27-avgust 2025 yil

KEY WORDS

Automation; employment paradox; OECD; productivity; labor market polarization; digital skills

ABSTRACT

This article explores the paradox of automation in OECD countries: while technological transformation significantly enhances productivity, its employment effects remain uncertain and uneven. Automation, artificial intelligence (AI), and robotics create efficiency gains and new opportunities in digital sectors but simultaneously displace routine and middle-skill jobs. This duality reflects the "employment paradox," where economic growth does not necessarily translate into inclusive job creation. Drawing on recent OECD reports and international studies, the article analyzes how automation drives productivity, alters labor demand, and reshapes employment structures. The findings emphasize the importance of digital skills, lifelong learning, and institutional adaptability to ensure that automation contributes not only to efficiency but also to inclusive labor market development.

Introduction

Automation has become one of the defining features of modern economies. In OECD countries, investments in robotics, artificial intelligence, and digital platforms are reshaping production processes and redefining competitiveness. On the one hand, these technologies drive efficiency, lower costs, and expand innovation (Brynjolfsson & McAfee, 2014). On the other hand, they raise concerns about job losses, social inequality, and the future of work (OECD, 2023).

This paradoxical dynamic — rising productivity alongside uncertain employment outcomes — has sparked wide academic and policy debates. The question is not whether automation will affect jobs, but how societies can manage its uneven consequences. For OECD countries, which are global leaders in digital adoption, the issue is particularly pressing.

Literature Review

Scholars have long debated the relationship between technology and employment. Joseph Schumpeter described technological progress as a process of “creative destruction,” where new innovations replace older industries. More recently, Autor, Levy, and Murnane (2003) argued that digital technologies substitute for routine tasks but complement non-routine, cognitive skills, producing shifts in labor demand.

OECD (2023) estimates that over one-quarter of jobs in its member states are at high risk of automation, with many more facing task transformation. Yet, automation does not always reduce overall employment. Acemoglu and Restrepo (2020) show that industrial robots can displace certain workers but also generate demand for complementary occupations. The International Labour Organization (ILO, 2021) adds that digital labor platforms expand access to flexible work, though often with precarious conditions.

Thus, the paradox is clear: automation boosts productivity but generates both opportunities and risks for workers.

Automation, Productivity, and Job Displacement

In OECD economies, automation has already reshaped entire industries by significantly improving productivity, particularly in manufacturing, logistics, and information services. In manufacturing, industrial robots have reduced the need for repetitive, routine manual tasks while dramatically increasing precision and efficiency. For instance, the automotive industry in countries such as Germany, Japan, and South Korea has been transformed by robotic assembly lines, where automation not only reduces production time but also minimizes errors and wastage. In logistics, automation has introduced innovations such as automated warehouses, predictive supply chain management, and the widespread use of robotics in packaging and delivery systems. Companies like Amazon have used these technologies to set new global standards in speed and efficiency. In the service sector, digital technologies and AI-based decision-making tools have streamlined information management, client services, and data-driven strategies in finance, healthcare, and retail (Brynjolfsson & McAfee, 2014).

The productivity gains from automation are essential for long-term growth and competitiveness. They allow firms to scale quickly, optimize resource allocation, and reduce transaction costs. For governments, the adoption of digital technologies is not merely a technological choice but a strategic necessity, as countries that lag in automation risk losing competitiveness in global value chains. However, these benefits are not evenly distributed across the labor market.

Routine-intensive occupations — clerical work, machine operation, and administrative support — remain the most exposed to automation. These tasks are structured, codifiable, and therefore easier to replace with machines or software (Autor et al., 2003). Workers who previously held secure, middle-income positions in these fields now face job insecurity or displacement. Middle-skill workers, once the backbone of industrial economies, are increasingly vulnerable, while high-skill and digital professions expand rapidly. This creates what economists call “labor market polarization” (OECD, 2023).

At the top of the spectrum, high-skill jobs in digital design, software engineering, and data analysis are booming, supported by strong demand for technical expertise in AI, cloud computing, and cybersecurity. At the bottom, low-skill service jobs such as care work,

hospitality, and delivery remain resilient because they require human interaction, empathy, or physical presence. Yet, these roles often come with low wages, limited benefits, and poor working conditions (ILO, 2021). Thus, automation deepens inequalities by strengthening the demand for high-skill workers while pushing many displaced workers into precarious employment.

The Employment Paradox in OECD Countries

The paradox emerges in the coexistence of rising output and shrinking opportunities for specific groups of workers. Productivity continues to rise thanks to digitalization, but the gains are not distributed equally. Instead of generating mass unemployment — as many feared in earlier automation debates — OECD countries face structural change: high-skill jobs thrive, low-skill services persist, and middle-skill jobs erode (Acemoglu & Restrepo, 2020).

This structural transformation leads to widening income inequality. High-skilled professionals, often concentrated in technology hubs and large urban centers, enjoy wage premiums and job security. In contrast, middle-class workers in traditional manufacturing towns face declining opportunities, while those moving into low-skill services often experience downward mobility. This threatens social cohesion and weakens traditional paths of upward social mobility.

Different OECD countries illustrate the paradox in distinct ways. In the United States, automation has hollowed out many routine manufacturing jobs, particularly in the Midwest, while digital services, e-commerce, and logistics networks have expanded rapidly (WEF, 2023). This shift has created regional divides between declining industrial areas and thriving tech-driven economies. In Germany, the paradox has been managed more inclusively. The country's strong vocational training and apprenticeship systems allow workers to retrain and move into higher-value positions, mitigating the negative impacts of automation (OECD, 2020). Nordic countries provide perhaps the clearest example of how institutional frameworks can cushion disruptions. With robust welfare systems, universal education, and continuous reskilling opportunities, they have managed to transform automation into an opportunity, ensuring that productivity growth translates into more equitable employment outcomes (Van Ark, 2016).

In short, the paradox of automation is not a uniform outcome but a reflection of how each country's institutions, policies, and labor systems respond to technological disruption. OECD experiences show that automation can coexist with both widening inequality and inclusive employment — depending on the capacity of societies to adapt.

Policy Responses: Turning Paradox into Opportunity

The OECD experience suggests that automation's employment paradox is not inevitable. Its impact depends on how governments, firms, and societies respond. Three policy areas are particularly important:

1. **Digital skills and lifelong learning.** Workers must adapt to changing labor demand through continuous reskilling and upskilling (OECD, 2022). Without such investment, productivity gains will bypass large segments of the workforce.
2. **Inclusive labor institutions.** Strong social protections, flexible labor markets, and active employment policies can help manage transitions and reduce inequality (ILO, 2021).

3. **Innovation with equity.** Encouraging the diffusion of digital technologies across small and medium-sized enterprises (SMEs) and rural areas can prevent the concentration of productivity benefits in a few large firms or regions (OECD, 2020).

Conclusion

Automation in OECD countries demonstrates the dual nature of technological progress. Productivity rises sharply, but employment outcomes remain polarized. The paradox lies not in the technology itself but in the institutional and policy frameworks that shape its adoption. Countries that invest in digital skills, education, and inclusive labor systems are better able to transform automation into an opportunity rather than a threat.

For developing economies such as Uzbekistan, the OECD experience offers valuable lessons: digital transformation must go hand in hand with human capital development and social protection to ensure that productivity gains translate into inclusive and sustainable employment growth.

References:

1. Acemoglu, D., & Restrepo, P. (2020). *Robots and Jobs: Evidence from US Labor Markets*. *Journal of Political Economy*, 128(6), 2188–2244.
2. Autor, D., Levy, F., & Murnane, R. (2003). *The Skill Content of Recent Technological Change*. *Quarterly Journal of Economics*, 118(4), 1279–1333.
3. Brynjolfsson, E., & McAfee, A. (2014). *The Second Machine Age*. W. W. Norton & Company.
4. International Labour Organization (ILO). (2021). *World Employment and Social Outlook: The Role of Digital Labour Platforms*. Geneva: ILO.
5. OECD. (2020). *Digital Economy Outlook 2020*. Paris: OECD Publishing.
6. OECD. (2022). *Skills Outlook 2022: Skills for a Resilient Green and Digital Transition*. Paris: OECD Publishing.
7. OECD. (2023). *Employment Outlook 2023: Artificial Intelligence and the Labour Market*. Paris: OECD Publishing.
8. Van Ark, B. (2016). *The Productivity Paradox of the New Digital Economy*. *International Productivity Monitor*, 31, 3–18.
9. World Economic Forum. (2023). *The Future of Jobs Report 2023*. Geneva: WEF.