ARTIFICIAL INTELLIGENCE AND THE TRANSFORMATION OF LABOR MARKETS: AN EMPIRICAL ANALYSIS OF EMERGING SKILLS DEMAND

Avaz Boboqulov
Student, Faculty of Economics, Tashkent University of Information Technologies named after Muhammad al-Khwarizmi, Tashkent, Uzbekistan E-mail: [avazboboqulov098@gmail.com]

Abstract: *The rapid diffusion of artificial intelligence (AI), and generative AI in particular, is reshaping the composition of labor demand across the global economy. This paper synthesizes recent cross-country statistical evidence from the International Labour Organization (ILO), the Organisation for Economic Co-operation and Development (OECD), the World Bank, and the World Economic Forum (WEF) to examine how AI exposure is redistributing skill requirements within occupations rather than uniformly eliminating jobs. Using a comparative, secondary-data approach, the study finds that roughly one-quarter of global employment is exposed to generative AI, with exposure concentrated in high-income economies and in occupations dominated by women. Rather than displacing workers outright, AI exposure is associated with rising demand for managerial, business, cognitive, and digital skills, alongside a projected net gain of tens of millions of jobs worldwide by 2030 accompanied by a substantial reskilling burden. The findings suggest that the central labor-market risk of AI is skill obsolescence and uneven adaptation capacity rather than mass unemployment, with particular implications for developing economies such as Uzbekistan, where AI usage remains concentrated in a narrow set of occupations. The paper concludes with policy implications for education systems, vocational training, and labor-market institutions.*

Keywords: *artificial intelligence; labor market; skills demand; occupational exposure; reskilling; digital economy*

INTRODUCTION

Artificial intelligence has moved from a specialized research field to a general-purpose technology embedded in everyday economic activity. The public release of large language model tools since 2022 accelerated a debate that economists have revisited with every major wave of automation: does new technology destroy jobs faster than it creates them, or does it primarily change what work looks like? Earlier waves of industrial automation disproportionately affected routine manual and clerical tasks performed by lower-skilled workers. Generative AI differs in an important respect: because it can produce text, code, and analysis, it is capable of automating and augmenting cognitive tasks previously considered resistant to automation, including tasks performed by highly educated professionals.

This shift has direct consequences for the demand for labor market skills. If AI primarily automates narrow, codifiable tasks within a job rather than replacing an occupation wholesale, then the labor-market adjustment is likely to occur through a

reallocation of skill requirements within existing roles rather than through mass job destruction. Understanding the direction and magnitude of this reallocation is essential for education planners, labor ministries, and universities that must decide which competencies to prioritize in curricula.

This paper addresses the following research question: which categories of skills are gaining or losing demand in occupations exposed to artificial intelligence, and how does this pattern vary across income groups and gender? To answer this question, the paper draws on the most recent publicly available cross-country statistical evidence rather than collecting new primary data, given the scale and comparability advantages of these existing multilateral datasets. The objective is to provide an evidence-based synthesis that can inform both academic debate and practical workforce-development policy, including for transition economies such as Uzbekistan that are only beginning to measure their own AI exposure.

2. Literature Review

The economic literature on technology and employment has long distinguished between the substitution effect, whereby machines replace human labor in specific tasks, and the complementarity effect, whereby technology raises the productivity and hence the demand for labor in tasks that remain human-performed. Task-based models of automation formalized this distinction by decomposing occupations into bundles of tasks rather than treating jobs as indivisible units, a framework that later research applied directly to generative AI.

Early assessments of generative AI's occupational exposure argued that the technology was more likely to complement than fully replace most jobs, because most occupations combine automatable and non-automatable tasks. Subsequent refinements of this exposure methodology, using far larger task databases and worker-reported data, estimated that approximately one-quarter of global employment is now in an occupation with some exposure to generative AI, with considerably higher exposure in high-income countries than in low-income countries, and with exposure concentrated among clerical occupations and, correspondingly, among women.

Complementary evidence from analyses of online job vacancies shows that occupations most exposed to AI are not necessarily demanding more specialized artificial intelligence or programming skills; instead, they show a rising demand for general management, business, finance, administrative, and clerical competencies, alongside emotional, cognitive, and digital skills more broadly. At the macro level, employer-survey-based projections estimate that technological change, alongside demographic and geoeconomic trends, will disrupt a substantial share of jobs by 2030, with a positive but modest net effect on total employment once job creation and displacement are combined. These same projections emphasize that skill instability, not headline job loss, is the dominant near-term consequence of AI diffusion, and that a large share of the global workforce will require some form of reskilling or upskilling within the decade.

Evidence on AI adoption in developing and middle-income economies remains comparatively thin. Available data indicate that AI usage in these economies is far more narrowly concentrated by occupation than in high-income economies, clustering heavily around information and communication technology (ICT) professionals and educators. This pattern suggests that developing economies, including Uzbekistan, may currently occupy an earlier stage of AI-driven labor-market transformation, with both a narrower current exposure and a policy window to shape how that exposure evolves.

3. Data and Methods

This study uses a comparative, secondary-data empirical design based on four recent multilateral statistical sources, rather than an original household or firm survey. This approach was chosen because (a) no single national dataset for Uzbekistan currently measures AI occupational exposure with comparable granularity, and (b) the multilateral datasets used here are themselves large-scale empirical instruments — combining employer surveys, online vacancy text analysis, and task-level exposure scoring — that allow meaningful cross-country and cross-group comparison.

The four data sources are: (1) the ILO/NASK refined Global Index of Occupational Exposure to Generative AI, which scores nearly 30,000 occupational tasks using worker assessments and expert validation across countries at different income levels; (2) the OECD's analysis of online vacancy postings, which tracks changes over time in the skills requested within occupations classified by their AI exposure; (3) the World Economic Forum's Future of Jobs Survey, based on more than 1,000 employers representing over 14 million workers across 55 economies, which projects job creation, displacement, and reskilling needs to 2030; and (4) the World Bank's Digital Progress and Trends Report, which documents the occupational distribution of AI usage across income groups.

The variables extracted from these sources include: occupational exposure gradient (share of employment in high-exposure occupations, disaggregated by country-income group and gender); the change in the share of vacancies requiring emotional, cognitive, or digital skills within AI-exposed occupations; projected job creation and displacement to 2030 as a share of total employment; the share of the workforce projected to need reskilling or upskilling and the share unlikely to receive it; and the occupational concentration of AI usage in middle-income countries. Analysis is descriptive and comparative: values are compared across income groups, across gender, and across time (where longitudinal data are available) to identify consistent directional patterns rather than to estimate causal parameters.

This design has an important limitation, discussed further in Section 5: because the four sources use different exposure methodologies and sampling frames, the comparisons offered here are indicative of direction and order of magnitude rather than strictly harmonized statistics. The paper treats this as a motivation for future primary data collection on AI exposure specific to Uzbekistan and Central Asia.

4. Results

Occupational exposure. Across the global workforce, approximately one-quarter of employment sits in occupations with meaningful exposure to generative AI. This share

is highly uneven across income groups: exposure reaches roughly one-third of employment in high-income countries but only around one-tenth in low-income countries. Within high-income countries, exposure is also unevenly distributed by gender: employment in the highest-exposure occupational category is nearly three times more common among women than among men, reflecting the concentration of clerical and administrative work among female employment.

Skill demand within exposed occupations. Rather than requiring specialized technical AI skills, occupations most exposed to generative AI show rising demand for general management and business competencies — including project management, finance, administration, and clerical coordination. Over time, the share of vacancies in these occupations requiring at least one emotional, cognitive, or digital skill has risen by roughly eight percentage points, indicating a broadening rather than a narrowing of the skill set employers expect from workers in AI-exposed roles.

Net employment projections. At the aggregate level, employer-survey-based projections estimate that technological change and related macrotrends will disrupt roughly one-fifth of all jobs by 2030, with about 170 million new roles created and 92 million roles displaced, yielding a net increase of approximately 78 million jobs globally. This net-positive figure sits alongside a substantial skill-instability estimate: on average, close to two-fifths of workers' current skill sets are expected to be transformed or become outdated over the same period.

Reskilling capacity gap. If the global workforce were represented as 100 workers, 59 are projected to require reskilling or upskilling by 2030; of these, 29 could be upskilled within their current roles and 19 could be redeployed elsewhere within their organization after retraining, but 11 are unlikely to receive the training they need, placing their employment prospects at risk. Consistent with this gap, 63 percent of employers identify skill shortages as the single biggest barrier to business transformation, even though 85 percent report plans to prioritize upskilling and 70 percent plan to hire staff with new skills directly.

Occupational concentration in middle-income economies. In middle-income countries — the income category most relevant to Uzbekistan's current position — AI usage at work is far more narrowly concentrated than in high-income countries: ICT professionals and teachers together account for close to three-quarters of measured AI usage, compared with a much broader occupational spread of AI usage in high-income economies.

5. Discussion

Taken together, these results support a "transformation rather than replacement" interpretation of AI's near-term labor-market effect: aggregate employment is projected to grow modestly rather than contract, but the composition of required skills is shifting quickly, and the workers most exposed to this shift are not evenly distributed across income groups or gender. The concentration of high exposure among clerical occupations, and correspondingly among women, suggests a labor-market polarization risk: workers in exposed, lower-paid administrative roles face pressure to acquire

managerial, digital, and cognitive skills, while the aggregate reskilling shortfall (11 of every 100 workers unlikely to be retrained) indicates that a meaningful minority may not make this transition successfully without external support.

For an emerging economy such as Uzbekistan, the occupational concentration of AI usage around ICT professionals and educators is best read as an early-stage signal rather than a stable long-run pattern. Because this concentration mirrors the low overall AI exposure typical of middle-income economies, current occupational effects are likely still forming rather than fully realized. This creates a policy window: universities and vocational institutions that expand digital-skills, data-literacy, and AI-complementary managerial training now may be positioned to shape the shift toward higher-value, higher-exposure occupations before displacement effects become more visible, rather than reacting to them after the fact.

Several limitations qualify these conclusions. First, the analysis relies entirely on secondary, aggregated statistics rather than a primary survey of Uzbek firms or workers; no dataset used here isolates Uzbekistan or Central Asia specifically. Second, the four sources apply different exposure and skill-demand methodologies — task-level worker assessment, vacancy-text analysis, and employer-survey projection — so the cross-source comparisons in Section 4 should be read as convergent directional evidence rather than a single harmonized statistical model.

Third, projections to 2030 embed assumptions about the pace of AI capability growth and adoption that may not hold, particularly in economies where AI diffusion depends on complementary digital infrastructure investment. Future research should collect primary firm- and worker-level data on AI exposure and skill demand within Uzbekistan, ideally replicating the ILO task-assessment methodology at a national level to allow direct comparison with the global estimates presented here.

6. Conclusion

This paper synthesized recent cross-country empirical evidence to examine how artificial intelligence is reshaping labor-market skill demand. The evidence indicates that AI's dominant near-term effect is the transformation of tasks and skill requirements within occupations rather than large-scale job destruction, with a projected net gain in global employment by 2030 accompanied by a substantial reskilling burden that is unevenly distributed by income group and gender.

For Uzbekistan and other middle-income economies, where AI usage remains concentrated among ICT professionals and educators, the findings point to a near-term opportunity to invest in digital and managerial skills training ahead of wider AI diffusion, rather than after labor-market disruption has already occurred.

Future empirical work grounded in primary national data is needed to test whether these global patterns hold within the Uzbek and Central Asian labor market specifically.

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