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NAVIGATING the AGE of AI

Implications for Poland's Economy

What AI means for Growth, Firms and Jobs

WORLD BANK GROUP

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AI in Poland at a Glance *(KEY INDICATORS 2025)*

FOUNDATIONS FOR AI

96/100

Government AI readiness—policy capacity

top global tier; Oxford Insights GAIRI, 2025

$320B

inward FDI stock since 2000

>3.5% of GDP annual average; NBP, 2025

39%

of firms are confident that courts will protect investments

one of lowest in EU; Eurobarometer, 2025

WORKERS & SKILLS

48%

of workers highly AI-exposed

vs 53% EU average; Lewandowski et al., 2025 (PIAAC)

607,000

IT specialists in Poland

largest pool in CEE; ABSL, 2025

50.4%

of individuals with digital skills

vs 60.4% EU average; Eurostat, 2025

AI IN THE ECONOMY

8.4%

of Polish firms use AI

vs 42% in Denmark, EU leader; Eurostat, 2025

7.7%

of manufacturing firms use AI

vs 17.3% EU average; Eurostat, 2025

$58.3B

knowledge-based services exports in 2025

83% of which through service centers, NBP, ABSL 2026

Main Abbreviations and Acronyms

ABSL	Association of Business Service Leaders in Poland
AI	Artificial Intelligence
AIOE	AI Occupational Exposure Index
AIVC	AI Value Chain
BAU	Business As Usual
BGK	National Development Bank of Poland (Bank Gospodarstwa Krajowego)
BSS	Business Services Sector
CCDR	Country Climate and Development Report
CEDEFOP	European Centre for the Development of Vocational Training
CEE	Central and Eastern Europe
CGE	Computable General Equilibrium
CIT	Corporate Income Tax
DESI	Digital Economy and Society Index
EC	European Commission
EU	European Union
EU-LFS	European Union Labor Force Survey
EUR	Euro
FDI	Foreign Direct Investment
GAIRI	Government AI Readiness Index (Oxford Insights)
GBS	Global Business Services
GDP	Gross Domestic Product
GDPR	General Data Protection Regulation
genAI	Generative Artificial Intelligence
GVA	Gross Value Added
GVC	Global Value Chain
HAI	Human-Centered Artificial Intelligence (Stanford HAI)
IBS	Institute for Structural Research *(Instytut Badań Strukturalnych)*
ICT	Information and Communications Technology
IFR	International Federation of Robotics
ILO	International Labour Organization
IMF	International Monetary Fund
IP	Intellectual Property
IP Box	Innovation Box (preferential tax regime for IP income)
IPP	Intellectual Property Products
ISCO	International Standard Classification of Occupations
IT	Information Technology
KFS	National Training Fund *(Krajowy Fundusz Szkoleniowy)*
KNF	Polish Financial Supervision Authority (Komisja Nadzoru Finansowego)
KRiBSI	Commission for the Development and Safety of Artificial Intelligence (Komisja Rozwoju i Bezpieczeństwa Sztucznej Inteligencji)
LLM	Large Language Model
ML	Machine Learning
MNE	Multinational Enterprise
MoE	Margin of Error
NACE	Statistical Classification of Economic Activities in the European Community
OECD	Organisation for Economic Co-operation and Development
OVGDP	Potential Gross Domestic Product (AMECO series code)
PFR	Polish Development Fund *(Polski Fundusz Rozwoju)*
PIAAC	Programme for the International Assessment of Adult Competencies (OECD)
PIE	Polish Economic Institute *(Polski Instytut Ekonomiczny)*
PIT	Personal Income Tax
PLLuM	Polish Large Language Model
PLN	Polish złoty
PSE	Polish Power Grid (Polskie Sieci Elektroenergetyczne)
R&D	Research and Development
SME	Small and Medium Enterprise
SNA	System of National Accounts
SSC	Shared Services Center
TFP	Total Factor Productivity
UNCTAD	United Nations Conference on Trade and Development
UOKiK	Office of Competition and Consumer Protection *(Urząd Ochrony Konkurencji i Konsumentów)*
VA	Value Added
VAT	Value Added Tax
VC	Venture Capital
VHCN	Very High Capacity Network
WEF	World Economic Forum

Key Terms and Definitions

AI Value Chain (AIVC)
AI value chain. The end-to-end process through which AI is produced and put to use — from chip design and data infrastructure through model training and software development to deployment in businesses and public services. A country's position in this chain has significant implications for how much economic value is retained domestically.

Business Services Sector (BSS)
A broad category of knowledge-intensive activities performed by firms on behalf of other businesses, encompassing professional services (legal, accounting, consulting, engineering), technology services, financial services, and shared service and global business services (GBS) operations. The sector is characterized by high task codifiability and intensive use of digital tools, making it among the most exposed to AI-driven automation and augmentation.

Computable General Equilibrium (CGE)
CGEs are economy-wide models that represent the simultaneous interaction of all markets — goods, services, labor, and capital — calibrated to real-economy data, typically a Social Accounting Matrix (SAM). CGE models capture feedback effects across sectors, households, and the external account, producing quantitative estimates of impacts on output, employment, wages, and income distribution. They are solved numerically, enabling counterfactual scenario analysis against a consistent baseline (Business As Usual or BAU).

Eurostat Digital Economy and Society Database
One of the most comprehensive official sources on business digitalization in Europe. It combines broad thematic coverage — from connectivity to AI, cloud, ICT security, data analytics, and digital skills — with structured breakdowns by firm size, sector, and region. Because it is built on harmonized annual surveys implemented by national statistical offices under common Eurostat methodology, it is particularly well suited for cross-country benchmarking and longitudinal analysis.

Foreign Direct Investment (FDI)
Cross-border investment in which a firm acquires a lasting interest and degree of influence in an enterprise operating in another economy, typically defined as an ownership stake of 10 percent or more. FDI is distinguished from portfolio investment by its operational dimension: investors seek not only financial returns but control over business decisions, technology deployment, and workforce practices.

Hyperscaler
Hyperscalers are major cloud computing providers — including AWS, Microsoft Azure, Google Cloud, Alibaba Cloud, and IBM Cloud — that operate massive, globally distributed data centers to provide scalable, on-demand infrastructure and high-volume data processing.

Intangible capital
Productive assets that lack physical form, including software, data, intellectual property, organizational know-how, brand value, and workforce training. Unlike tangible capital, they are non-rival and are characterized by high fixed costs of creation but near-zero marginal costs of reproduction.

Nearshoring/Friendshoring
Nearshoring. The relocation of business activities or supply chain functions to geographically proximate countries, typically motivated by a combination of cost considerations, logistical efficiency, cultural and time-zone proximity. Friendshoring. A variant in which firms and governments prioritize relocating supply chains and investments to politically aligned or geopolitically trusted partner countries, rather than optimizing purely on cost or proximity.

Economic Convergence
The process by which lower-income economies grow faster than higher-income ones, narrowing the gap in productivity and living standards over time. Within the European Union, convergence is a stated policy objective supported by cohesion funding.

Brownfield/greenfield
Two distinct modes of foreign direct investment. Greenfield investment involves the establishment of entirely new productive capacity — building new facilities, hiring new workers, and introducing new technologies. Brownfield investment involves the acquisition or expansion of existing enterprises, which may consolidate operations and generate efficiency gains but does not necessarily introduce new capabilities or expand aggregate productive capacity.

Upskilling/Reskilling
Related but distinct responses to labor market change driven by technological or structural shifts. Upskilling refers to the deepening of existing skills — enabling workers to perform their current or adjacent roles at a higher level of competency. Reskilling refers to the acquisition of substantially new competencies, enabling workers to transition into different occupations or sectors as their existing roles are automated or restructured.

INTRODUCTION

Artificial Intelligence (AI) – and particularly generative AI (genAI) – is a general-purpose technology with the potential to reshape economies and societies, through its effects on productivity, labor markets, and production structures (Bick et al., 2026; Brynjolfsson et al., 2024; Cazzaniga et al., 2024). Unlike previous technologies, AI extends automation beyond physical and routine tasks to cognitive, linguistic, and decision-making functions (Insights #1). White-collar tasks face growing displacement pressure as capabilities expand into language and reasoning (Acemoglu & Restrepo, 2022; Felten et al., 2023). Value creation is increasingly concentrated in intangible assets – software, Research & Development (R&D) and organizational capital – as reflected in their rising share of business investment and firm valuations across advanced economies (Haskel & Westlake, 2018). Depending on the pace and extent of AI diffusion, these effects could translate into economy-wide implications for growth, jobs, inequality, and structural transformation.

To a large extent, however, the realized impact of AI will depend on policy and institutional choices that shape incentives for adoption and development, investments in skills, capital, and digital infrastructure, and the distribution of gains from technological change. A country's starting conditions matter, but their economic returns hinge on whether institutions and policies translate them into productive use. In the absence of supportive policies, rapid technological progress can exacerbate existing disparities across firms, workers, and regions, as more productive and better-resourced actors are able to adopt and scale new technologies faster than others (Autor et al., 2020; Acemoglu & Restrepo, 2020). Conversely, well-designed policy frameworks can accelerate diffusion, foster complementarities between technology and labor, and support a more inclusive pattern of growth (Aghion et al., 2019). The economic reach and impact of AI therefore depend not only on technological progress, but also on choices made today by governments, firms, and societies at large.

Informed decision making requires robust evidence. While evidence on firm-level adoption and the types of work AI affects is growing, empirical evidence on AI's macroeconomic and distributional impacts remains limited and uneven. Adoption has accelerated across sectors, but productivity gains at the aggregate level have yet to fully materialize, consistent with historical patterns of general-purpose technology diffusion (Brynjolfsson & McAfee, 2014). Governance frameworks, common standards, and sector-specific guidelines remain underdeveloped relative to the pace of deployment. Quantitative projections diverge sharply, ranging from conservative projections of 0.07 percentage points (pp) additional annual Total Factor Productivity (TFP) growth over the next decade (Acemoglu, 2024) to more optimistic forecasts of 0.68 – 1.24 pp (Aghion & Bunel, 2024).

Further, countries differ markedly in their preparedness to harness AI's productivity potential. Frontier AI model development remains concentrated in the United States and China. Advanced economies, with stronger digital infrastructure, higher human capital, and more developed regulatory frameworks, are better positioned to adopt AI and capture aggregate productivity gains (Cazzaniga et al., 2024; Misch et al., 2025). For economies facing demographic decline, AI-enabled productivity growth represents a potential offset to shrinking labor supply. In contrast, emerging markets and developing economies face compounding constraints: limited access to advanced AI technologies, underdeveloped digital and energy infrastructure, and labor markets less prepared for the job disruptions AI can bring (Gmyrek et al., 2024 & 2026; Cerutti et al., 2025). Distributional impacts on workers remain particularly uncertain, with evidence on task-level exposure outpacing evidence on wage, employment, and wellbeing outcomes at the aggregate level (Gmyrek et al., 2023; 2025).

Poland's position in the AI landscape reflects its role as a capable adopter rather than a frontier innovator. As a large, high-income EU member state, Poland has built considerable strength in AI-enabling services — software development, data-intensive business processes, and Information-Technology (IT) outsourcing — which underpin diffusion primarily through use, adaptation, and integration into existing firms and value chains, while remaining marginal in frontier model development and foundational research. This positioning implies that AI's economic impact in Poland will operate mainly through productivity gains in incumbent firms and task reorganization, rather than through breakthroughs at the technological frontier. EU membership confers important advantages, including access to a unified regulatory framework, the Digital Single Market, and substantial financing for digital transformation. Digital infrastructure has improved markedly, with Very High Capacity Networks reaching 81% of households, slightly above the EU average of 79%. Human capital is strong, with 46% of 25 – 34-year-olds holding tertiary qualifications. Against this backdrop, Poland has articulated an ambitious policy agenda to accelerate

AI-driven transformation and consolidate its position as a regional leader in AI adoption (Insights #2).

Yet Poland's structural constraints threaten to limit the scale, speed, and inclusiveness of AI-driven gains. R&D intensity and firm-level digitalization lag the EU average, venture capital for AI startups remains shallow compared to frontier EU countries, and anchor institutions capable of frontier research are few compared with Western Europe (World Bank, 2026; Eurostat, 2024; Statistics Poland, 2025). While Poland's skills are often cited as a strength — it has one of the EU's higher shares of young people employed with an Information and Communications Technology (ICT) education — the layers most relevant to AI diffusion lag: ICT specialist employment, basic and advanced digital skills, and adult learning participation (European Commission, 2024). Combined with limited workforce reallocation, these gaps could slow AI diffusion and firms' ability to scale AI-intensive activities. Energy presents a further complication. Poland's electricity mix remains relatively carbon-intensive — coal still dominates (World Bank, 2024) — raising both the emissions footprint and operating costs of AI infrastructure such as data centers. Grid capacity constraints compound the problem, limiting how quickly new electricity demand can be met and where AI infrastructure can be deployed.

This report examines how AI diffusion is likely to affect Poland's economy given its position in global AI value chains and existing structural conditions. It assesses both the opportunities and constraints AI may create and explores what policy choices can be made today to steer that process in a direction consistent with the country's long-term priorities. The analysis is designed to support evidence-based decision making under conditions of high uncertainty, using tools and analyses that have been developed specifically for the report and can be accessed online. MANAGE-AI represents a core innovation in that regard: a new World Bank Group Computable General Equilibrium (CGE) model calibrated to the Polish economy that delivers scenario-based analysis of the structural macroeconomic consequences of AI adoption. The report does not focus on regulatory or governance questions. This reflects two considerations: most of Poland's AI regulatory environment is determined at the EU level — with binding obligations flowing primarily from the AI Act and the Digital Single Market framework — and the governance landscape remains in flux, with key implementing provisions still being elaborated and their practical effects on firms and adopters not yet observable. The report also does not undertake an in-depth analysis of energy and infrastructure requirements; investment in these areas is assumed to proceed in line with current government policies.

THE REPORT IS ORGANIZED AS FOLLOWS:

What do we mean by AI?

Artificial intelligence (AI) refers to software systems that use data-driven methods – particularly machine learning – to perform tasks associ.ated with human cognitive functions, including prediction, classification, generation, and decision support. AI systems can be deployed as embedded software, firm-level applications, or cloud-based services accessed through digital platforms.

Generative AI (genAI) is a subset of AI that produces new content – text, code, images, and synthetic data – by learning statistical patterns from large training datasets.

For macroeconomic analysis, AI is best understood not as a separate sector but as **a general-purpose digital technology that changes how firms transform inputs into output.** Firms access AI capabilities through two main channels:

1. **AI services purchased as intermediate inputs** (such as cloud-based AI tools, AI-as-a-service platforms, agentic AI agents, APIs), recorded in national accounts as intermediate consumption in software and IT services, and data-processing activities. When purchased from foreign providers, they are recorded as imports of digital services.

2. **AI software and models accumulated as intangible capital,** through licensed foundation models (including large language models (LLMs) and the agentic systems built on top of them), proprietary systems, or internally developed AI software, recorded as investment in intellectual property products (IPP) in national accounts.

AI affects economic outcomes through several transmission channels. Following the task-based framework of Acemoglu and Restrepo, it can automate (substitute) specific tasks previously performed by workers, augment (complement) the productivity of remaining labor, and enable new production processes and business models. Over time, these mechanisms can lead to higher productivity, changes in labor demand across occupations, and the reallocation of capital and workers across sectors.

Poland 2035 Vision

Poland's Development Strategy to 2035 sets out an ambitious vision of a more competitive, fair, and secure economy built on three core goals: mitigating the effects of demographic change, creating conditions for a competitive and environmentally sustainable economy, and strengthening the resilience and effectiveness of the state. Underpinning all three is a recognition that Poland's current growth model – grounded in cost competitiveness and mid-tech manufacturing – must evolve. The strategy calls for a decisive shift toward higher value-added activities, deeper innovation capacity, and stronger positioning of Polish firms within global value chains.

Technological progress and innovation are central to this transformation. Poland aims to raise its gross expenditure on R&D from 1.41% of Gross Domestic Product (GDP) in 2024 to at least 2.0% by 2030 and 2.5% by 2035. The strategy targets a significant expansion of the venture capital (VC) ecosystem, with VC investment rising from 0.05 to over 0.3% of GDP, and growth in the number of Polish unicorns from 14 today to at least 44 by 2035. The goal is not only to spend more on innovation, but to translate that spending into tangible market outcomes.

The strategy identifies genAI as a breakthrough technology capable of driving productivity gains across the economy, public administration, and society at large. The government's AI Policy to 2030 (April 2026) sets an ambition for the country to become a leading AI nation in Europe, targeting a place among the top 10–20 countries in major global AI readiness rankings. Key quantitative targets include: at least 34% of Small and Medium Enterprises (SMEs) using AI tools by 2030, and a 50% increase in venture capital/private equity investments in the AI sector by 2030. The policy is structured around five strategic goals: (1) building a coordinated AI ecosystem that supports the broader economy through technological infrastructure; (2) developing a society with advanced AI competencies, with at least 30% of the population holding above-basic AI skills and an 80% increase in AI-related graduates; (3) deploying AI across government services, with at least 80% of public entities using AI tools and a pilot rollout of the Polish Large Language Model (PLLuM) across 1,000 public institutions; (4) positioning Poland as the "Heart of the AI Continent" by fostering business innovation and investment; and (5) ensuring that AI development remains human-centered, ethical, and trustworthy, including through measures to strengthen public trust and combat disinformation.

> Artificial intelligence is a breakthrough technology that can significantly increase productivity across various sectors of the economy and is becoming one of the key areas of global competition.
>
> Draft of Poland's Development Strategy to 2035

> Poland will emerge on the international stage as a significant exporter of safe and trustworthy AI products and services, and as a location attractive to investors in terms of regulatory risk and the scope of regulation.
>
> Draft of Poland's AI Development Policy to 2030

1 AI FUTURES:

HOW AI COULD TRANSFORM POLAND'S ECONOMY

Exploring economy-wide effects:

What to expect for growth, productivity and jobs?

1.1 The opportunity for productivity-driven growth

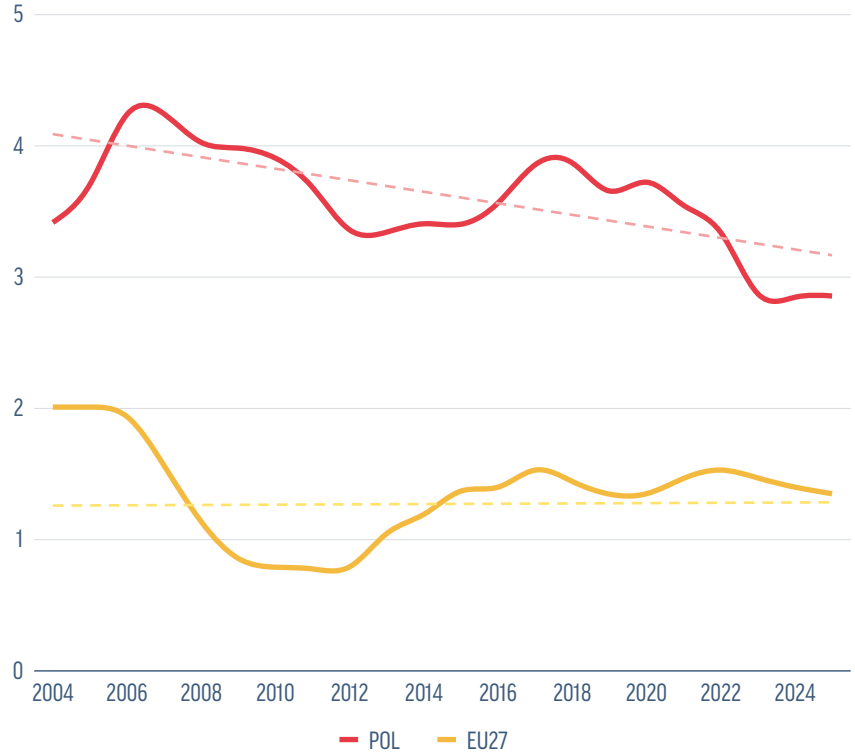
Poland's remarkable convergence over the past three decades is approaching a structural inflection point. Its transition to high-income status was among the fastest in recent decades, supported by institutional and firm upgrading, skills development, and integration into European value chains—underpinned by technology adoption—which together drove sustained TFP gains (World Bank, 2017). But the next stage of convergence is more demanding. As cost advantages fade, demographic pressures intensify, and the gains from imported technology diminish, Poland will need to rely more on innovation, intangible capital, and firm-level capabilities to continue closing the gap with the frontier (World Bank, 2026). Yet these foundations remain underdeveloped: Poland invests 35% less in R&D than the EU average, business R&D is 40% lower, and intangible assets account for only 26% of corporate investment, compared with 37% in the EU. Combined with a projected workforce decline of 1.5 million by 2035 (Government of Poland, 2026), these gaps point to the need for a further shift toward knowledge-intensive, innovation-driven growth.

Poland has the foundations, the policy commitment, and the market scale to translate AI diffusion into sustained productivity gains. The country's diversified industrial base, its integration with the EU market, and expanding digital workforce provide strong foundations for capturing these gains; and Poland's policy agenda explicitly targets this technological revolution (Insights #2). As AI technologies become increasingly accessible, their diffusion (Insights #3) across firms and sectors could become a key driver of Poland's next phase of productivity growth and economic convergence.

FIGURE 1.1 Poland's catch-up premium is fading

Potential GDP growth rate, 3-year trailing moving average

Percent per year



Source: European Commission, AMECO database (Spring 2025 vintage). Series Potential Gross Domestic Product (OVGDP).

INSIGHTS #3

Global and regional trends in AI adoption and diffusion

Global diffusion of AI is accelerating in frontier digital economies but remains uneven across countries and firm sizes. Among large, globally operating organizations, adoption is already widespread—88% report using AI in at least one business function (McKinsey, 2025), reflecting higher uptake in frontier digital economies. The picture looks different for smaller firms: across OECD economies, only 17% of small enterprises used AI in 2025, compared with 52% of large ones, with an overall adoption rate of 20% (OECD, 2025).

Within the EU, AI diffusion is highly uneven across both sectors and countries. Communication leads with 62.5% of firms using AI, followed by professional and technical services at 40.4%, while adoption remains much lower in manufacturing (around 11%) and construction (below 11%) (Eurostat, 2025). Country-level disparities are equally striking: Denmark leads with 42% of enterprises having adopted AI, while Poland stands at 8.4% and Romania at just 5.2% (Eurostat, 2025)—illustrating that even within a single regulatory and economic bloc, adoption trajectories diverge sharply.

Europe lags in AI investment and frontier development. Global private AI investment reached a record $581 billion in 2025, more than double the $253 billion recorded in 2024, with over $344 billion invested in the U.S. alone (Stanford HAI, 2026). Europe, by contrast, attracted only a small fraction of this total, with most EU member states individually drawing less than a single major U.S. funding round. The gap in frontier model development is equally pronounced: in 2025, U.S.-based organizations released 50 notable AI models, while European output remained marginal (Stanford HAI, 2026).

To accelerate diffusion and strengthen technological capacity, the EU adopted the AI Continent Action Plan in April 2025. Through the InvestAI initiative, the EU aims to mobilize €200 billion in AI investment. The plan includes 13 AI Factories and up to five AI Gigafactories, each hosting more than 100,000 advanced AI processors, alongside initiatives to expand data center capacity and strengthen adoption through European Digital Innovation Hubs, which can help SMEs integrate AI into production and business processes.

See **Appendix Book** for details on diffusion and adoption assumptions used for modeling; Section 2.1 on Poland's specificities.

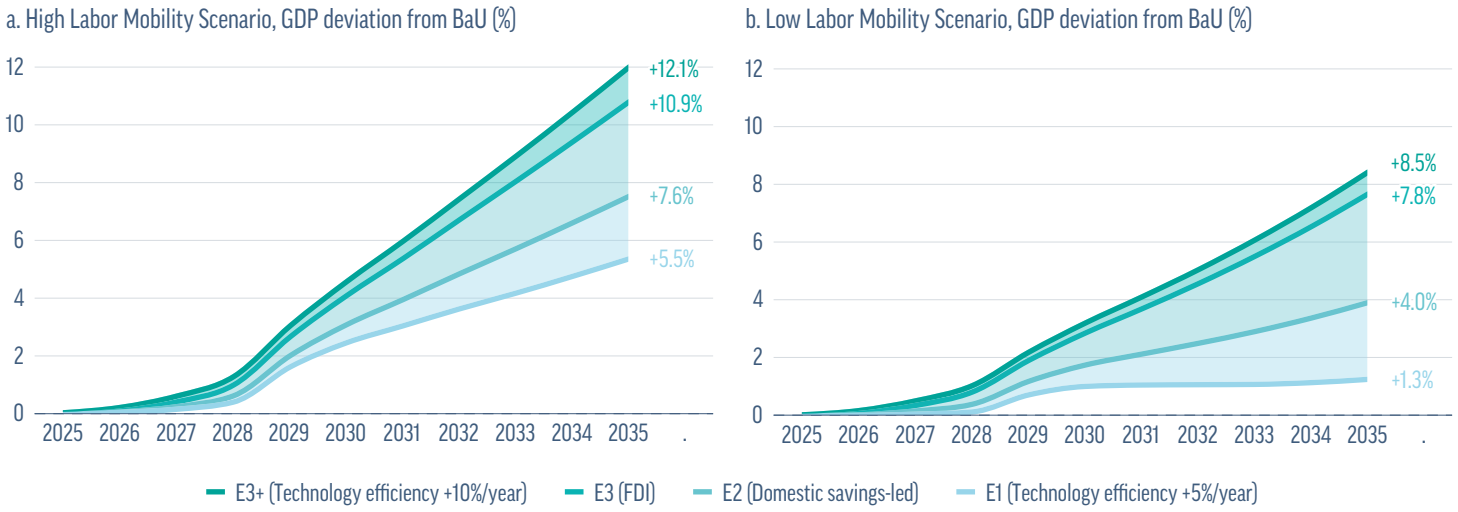
Higher AI adoption could raise Polish GDP by more than 10% by 2035

Poland's real GDP level could increase by between 1.3% and 12.1% by 2035 relative to a baseline in which AI adoption remains at current levels (BAU, Insights #5), with gains of 2–3% already visible within the next three years. These estimates are based on a four-fold expansion in AI adoption, from 8.4% today to close to 45% by 2035—consistent with Poland's stated policy targets (Insights #2)—with frontier sectors such as ICT more than doubling their adoption rate, from around 30% today to as high as 70% by 2035.

The range reflects two key sets of assumptions. The first is how easily workers can move across sectors and occupations—whether they can reskill and retrain quickly, supported by firms and government programs, or whether skill mismatches and institutional barriers slow the process down *(High and Low Mobility scenarios);* evidence suggests these frictions can be substantial and persistent (Acemoglu & Restrepo, 2022) but when supported by enabling institutions, technological transitions can achieve adequate reallocation of workers into higher-quality employment (Dauth et al., 2021). The second is the scale and quality of AI investment. At the macroeconomic level, the pace of adoption is shaped by how much financing the economy can mobilize; whether enterprises can draw on adequate savings and capital access to fund adoption at scale (E2) including from abroad (E3) (Aghion, Jones & Jones, 2019). But investment outcomes in turn depend on firms' capacity to realize the benefits of adoption: managerial skills, data readiness, and technological sophistication determine whether investment generates benefits (see Section 2.1). Both constraints bind in Poland's context. The 10.8 pp gap in the top chart reflects the combined returns to getting both right, and both are within the reach of policy. Throughout the report, unless otherwise stated, we present the policy-consistent scenario (High Mobility, E3).

All results are drawn from Poland's MANAGE-AI, a new CGE model built specifically to capture how AI reshapes labor markets and growth; see Insights #4 & Insights #5 for a full description; and the **Appendix Book** for details.

FIGURE 1.2 'Real GDP could be 12% higher by 2035 with high labor mobility



Notes: Technology efficiency increases between 5–10% per year (E1–3 vs E3+); domestic-savings-led channel operationalizes as a 2 pp per year in non-ICT enterprise savings; (E2); FDI/GDP rises 0.4 pp/year (E3). Low mobility scenario at the bottom.

Poland's AI dividend depends on when action is taken

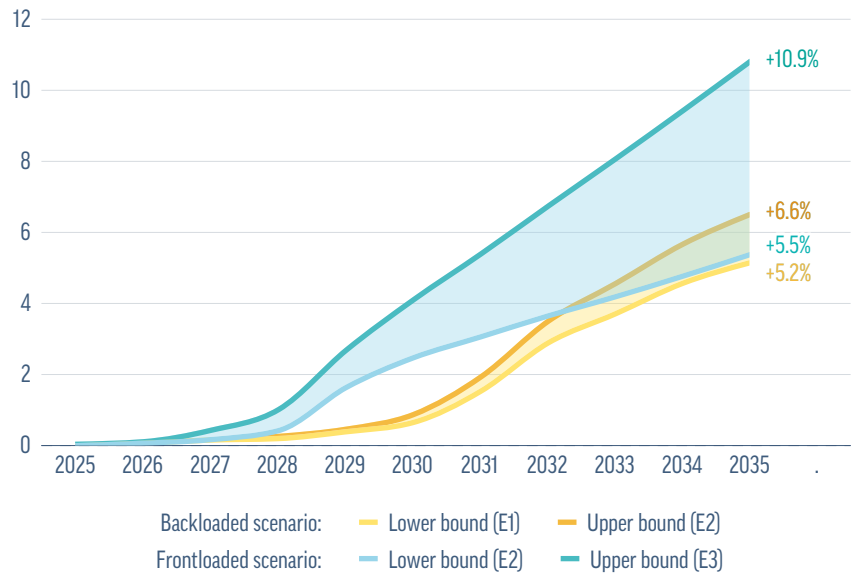
Poland's AI dividend depends on both when adoption happens and whether financing channels activate to scale it.

Under the Backloaded (BL) scenario, Poland postpones action while the rest of the world advances: investment decisions are deferred, adoption picks up only in the early 2030s, and near-term worker disruption is more moderate. But FDI and high-value AI activity that could have been anchored in Poland during the early window flow to faster-moving competitors, and future capital mobilization becomes harder more uncertain once global leaders have pulled ahead.

Under the Frontloaded (FL) scenario, gains begin materializing earlier, productivity improvements compound through the decade, and Poland attracts AI-related investment while the global market for it remains competitive; displacement pressures on workers are relatively more acute in the near term, but so are the augmentation benefits, and the larger early dividend creates fiscal space to fund the transition.

Two effects compound across the scenarios. First, timing of adoption matters in its own right: earlier adoption (FL) lets productivity gains compound, lifting outcomes above BL paths even when financing conditions are held constant (E1). Second, financing determines how far adoption can go: when FDI inflows and domestic savings mobilize into productive AI investment (upper bounds), adoption scales to a larger capital stock and the dividend rises substantially. The welfare-relevant measure is not the 2035 endpoint but the cumulative dividend—the area under the curve—and on that measure the gap between paths widens over time.

FIGURE 1.3 **Growth dividends could be smaller with delayed action**



Notes: High Labor Mobility; technology efficiency increases by 5% per year; domestic-savings-led channel operationalized as a 2 pp per year in non-ICT enterprise savings; FDI/GDP rises 0.4 pp/year.

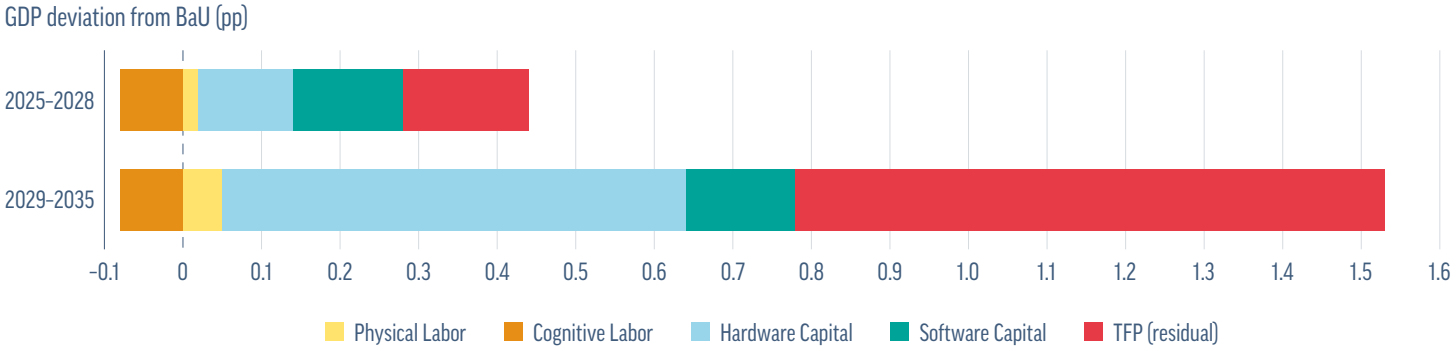
See **Appendix Book** for alternative scenario with AI adoption at half the policy-path rate (reaching about 20% adoption by 2035).

Productivity gains predominantly drive the growth dividends

Relative to the BAU scenario in which AI adoption remains at current levels, AI could add 0.35 pp to annual Gross Value Added (GVA) growth in the early transition period (2025–2028), rising to 1.45 pp per year in 2029–2035 as adoption deepens and productivity gains compound. Decomposing the sources of GVA growth under the policy-consistent scenario (E3) reveals a pattern characteristic of a general-purpose technology: economy-wide efficiency gains combined with sustained capital deepening.

TFP is the dominant driver, accounting for roughly half of the total GVA differential. TFP captures the full range of efficiency gains from AI: how workers use AI tools more productively (augmentation), how firms extract more value from their software and hardware investments as their efficiency improves, how automation of tasks raises output per worker by allowing the same or greater output with less labor input (automation/substitution), and how AI diffusion generates broader economy-wide improvements in production processes as it spreads across sectors. **Software capital** makes a stable contribution, reflecting sustained firm-level investment in AI tools and systems. **Hardware capital** tells a more dynamic story, becoming the second-largest contributor by 2029–2035. This reflects two concurrent dynamics. First, the scaling up of physical AI infrastructure as adoption deepens. Second, in traditional sectors—energy, manufacturing, construction, and logistics—a dual effect unfolds: the expansion of physical assets driven by rising demand, alongside parallel capital deepening (note that embodied or physical AI effects lie outside the model's scope).

FIGURE 1.4 **TFP is the dominant driver, accounting for roughly half of the total GVA differential**



Notes: High Mobility, E3 scenario.

Labor tells a more nuanced story. Physical labor makes a small positive contribution: as AI-driven productivity gains expand economic activity, demand for physical-task-intensive work rises with income, while these tasks remain largely outside the scope of direct AI substitution. Hardware capital deepening partially offsets this in capital-intensive sectors. **Cognitive labor** sees a net negative contribution. This is because labor automation (substitution) is outpacing labor augmentation (complementarity) over the modeling horizon, reducing the quantity or wages of cognitive labor input relative to BAU.

See **Appendix Book** for details on demand-side decomposition and trade dynamics.

Modeling the macroeconomic impact of AI

Standard general equilibrium models are ill-equipped to capture what makes AI distinctive as a technology. Conventional CGE frameworks either treat AI as a generic productivity shock or reduce it to capital deepening, obscuring the task-level heterogeneity, dual automation-augmentation dynamics, and economy-wide feedback loops that define AI's actual impact on labor markets and growth. Uncertainty around AI and its diffusion makes scenario-based planning indispensable—and with appropriate adjustments, CGEs can serve as a valuable instrument for policy makers, offering a structured, economy-wide lens through which alternative trajectories can be systematically compared.

MANAGE-AI is a new CGE model developed by the World Bank Group during this project, in cooperation with the Łukasiewicz Research Institute, ILO, and Poland's Ministry of Finance to address this gap. Built on the MANAGE-WB CGE, the single-country model extends the standard production function by decomposing factor inputs into a **Hardware** bundle (physical capital and physical labor) and a **Software** bundle (digital/AI software capital and human cognitive labor)—following Growiec, Jabłońska, and Parteka, 2024. AI enters the economy both as an intermediate service and as intangible capital, consistent with the System of National Accounts (SNA) 2025 classification.

Three innovations distinguish MANAGE-AI from standard CGE approaches. First, it models **task-level heterogeneity:** occupation-level elasticities of substitution between AI software and cognitive labor are calibrated using genAI exposure gradients (Gmyrek et al., 2025), anchored to empirical estimates. Occupations are differentiated by their degree of exposure and the nature of their tasks (i.e., physical or cognitive). Second, the model incorporates **AI diffusion dynamics:** AI adoption follows sector-specific logistic curves calibrated to observed Eurostat ICT survey data (2021–25), with saturation levels consistent with EU Digital Decade targets. Third, it captures **frontier technology improvement:** an annual efficiency gain of 5–10% is applied to the software-capital bundle, reflecting the pace of AI model improvement at the global frontier independent of domestic investment decisions.

The model covers 21 production sectors (NACE) and 9 occupational categories (ISCO 1-digit). Results are presented as deviations from a no-further-adoption baseline through 2035, under different labor mobility (high and low mobility) and AI diffusion scenarios. Net employment effects—distinguishing substitution/automation (job displacement), augmentation/reinstatement (new job creation), and expertise-reducing outcomes (employment gains with wage erosion)—vary by sector, occupation, and mobility assumption. The model does not cover new occupations or sectors that could be generated from technological change or embodied or physical AI. The overall net labor impacts could be higher or lower depending on these dynamics.

See **Appendix Book** for details on the MANAGE-AI model.

How to read the results?

Using MANAGE-AI we compare scenarios against a baseline, Business As Usual (BAU). The baseline is calibrated to replicate the performance of the economy for the key macroeconomic and fiscal indicators as well as population growth and the employment rate until 2025, and forecasts for the rest of the period. Under BAU, AI adoption remains constant at the 2025 levels through 2035.

To model the impact of AI, different scenarios are estimated. The results should be read as % or pp deviations from BAU. Most scenarios are cumulative: they build on each other rather than standing alone, so the differences between them isolate the contribution of one specific change.

The scenarios vary along four dimensions. **First, labor mobility:** how freely workers can move between sectors and occupations as AI reshapes the demand for different skills. **Second, the AI adoption pathway:** whether Poland acts early in the decade to build the capital, skills, and institutions that allow AI to diffuse, or delays action and catches up later. **Third, the financing of AI-related capital:** whether additional investment is mobilized through domestic firm savings, FDI, both, or neither. **And fourth, the efficiency of the technology:** how rapidly AI capabilities themselves improve at the global frontier. This captures the pace at which the same unit of AI software produces more output each year, reflecting the rate of AI model improvement. Because this depends on global R&D rather than domestic policy, we treat it as a sensitivity parameter: the main scenarios use a conservative 5% annual efficiency gain, with a 10% upper-bound variant. Each of these dimensions is parameterized in a way that maps onto policy levers the Polish government controls or influences.

See **Appendix Book** for details on the MANAGE-AI model.

TABLE I5.1 Main macroeconomic indicators—BAU

Yearly average for the period

	2025	2026 - 2029	2030 - 2035
Population growth (%)	-0.4	-0.5	-0.5
Real GDP growth (%)	3.6	2.8	2.1
Consumer Price Index (%)	3.6	2.6	2.0
Consumption (% of GDP)	76.5	73.8	73.3
Investment (% of GDP)	19.3	22.8	23.3
Net exports (% of GDP)	3.6	3.5	3.5
Current Account Balance (% of GDP)	-0.9	-0.7	0.3
Tax revenue (% of GDP)	22.2	21.9	22.3
Primary balance (% of GDP)	-4.7	-2.4	-0.8
Fiscal balance (% of GDP)	-7.3	-4.9	-3.4
Debt (% of GDP)	59.7	68	76.3

TABLE I5.2 Scenarios

Scenario	Technology efficiency	Financing channels	Variants run	Role in the report
E1	5% per year	None	High Mobility/ Low Mobility × Front Loaded AI adoption / Backloaded	Contribution of AI technology alone
E2	5% per year	+ Non-ICT firm savings +2 pp/yr	HM / LM × FL / BL	Adds the domestic-savings channel
E3	5% per year	+ FDI/GDP +0.4 pp/yr	HM / LM × FL only	Adds FDI; E3 (HM, FL) is the policy-consistent scenario
E3+	10% per year (upper bound)	Same as E3	HM / LM × FL / BL	Upper-bound technology sensitivity

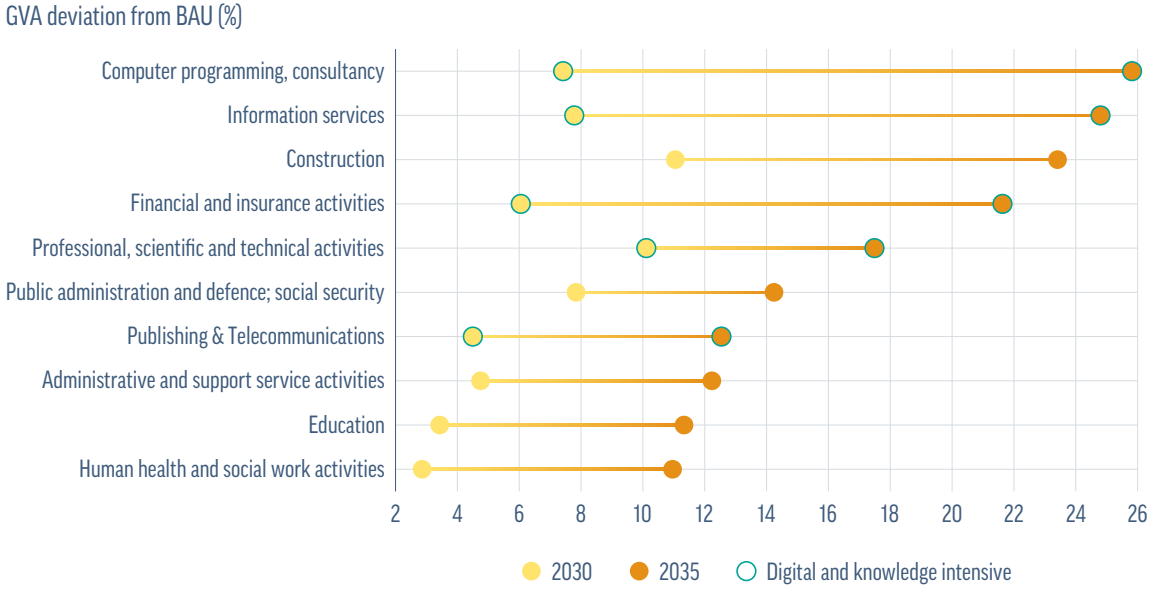
Notes: Scenarios are cumulative – E2 adds the domestic-savings channel to E1; E3 adds FDI to E2; E3+ raises the technology frontier. The policy-consistent scenario is specifically E3 under High Mobility and Front-Loaded adoption; it is the default scenario used throughout the main report.

Digital and knowledge-intensive sectors gain most from AI diffusion

Computer programming, services, and financial and professional services see the largest output gains relative to BAU—reflecting their higher AI exposure, greater share of automatable and augmentable cognitive tasks, and stronger capacity to integrate AI into core business processes. Gains are back-loaded: the bulk of the differential materializes in the 2030–2035 period as adoption deepens and productivity improvements compound.

Financial and insurance activities, and construction also stand out but for different reasons: finance benefits from high cognitive intensity and AI complementarity, while construction gains reflect capital-intensive hardware deepening.

FIGURE 1.5 Digital and knowledge-intensive sectors gain most from AI diffusion



Source: World Bank MANAGE-AI model. % deviation from BAU. Policy-consistent scenario (E3, High-Mobility). Top 10 sectors by 2035 output gain.

AI upgrades Poland's economy without altering its structural core

AI shifts value added (VA) toward knowledge-intensive sectors relative to BAU. Computer programming gains around 0.5 pp of total VA share, financial and insurance activities around 0.4 pp, and professional and technical services around 0.3 pp. The additional share shifts toward construction, driven by complementary capital investment. Manufacturing (-0.8 pp) and transportation and storage (-0.4 pp) lose the most ground. These shifts are consistent with the literature on AI-driven structural change: sectors with high cognitive task content gain relative share as AI raises their productivity faster than traditional industries (Acemoglu & Restrepo, 2022).

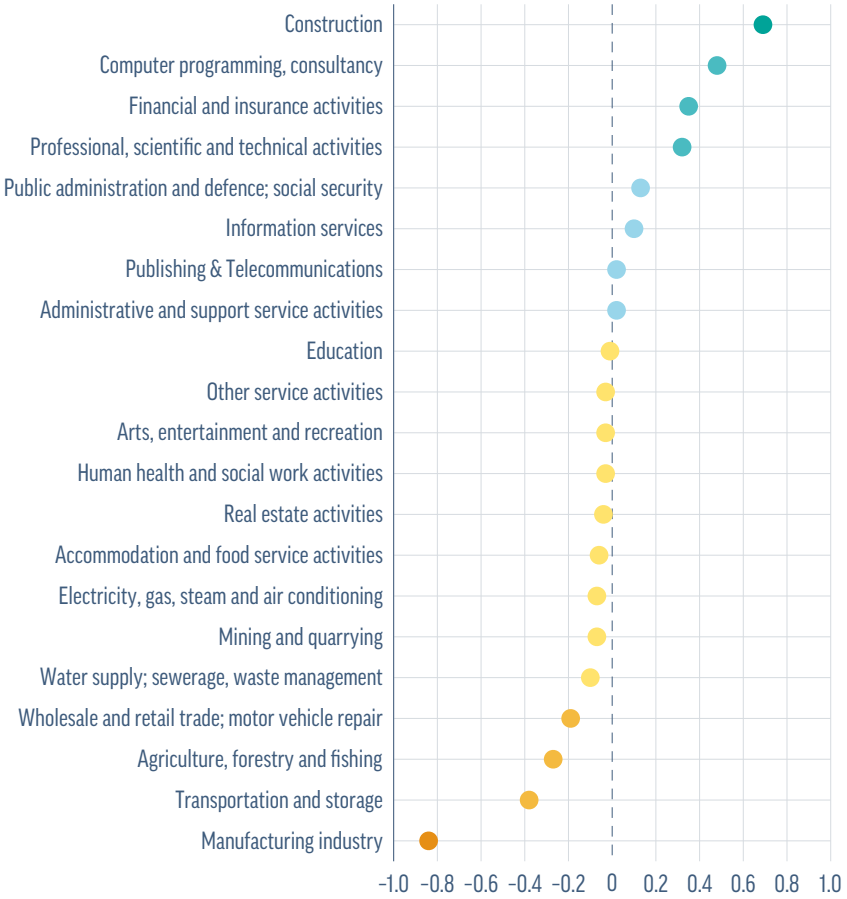
Yet Poland's sectoral structure proves remarkably stable. Manufacturing (Insights #6) retains about 17% of total VA throughout the modeling period; wholesale and retail trade holds a similar share. Together these two traditional sectors still account for over a third of the economy in 2035. This stability is not coincidental. A Baumol-type dynamic is at work: AI-driven productivity gains in leading sectors push wages up across the broader economy, and the resulting expansion of household purchasing power sustains labor demand in traditional sectors—manufacturing, trade, and consumer services—where productivity growth is slower but labor remains indispensable (Baumol, 1967; Aghion, Jones & Jones, 2019). AI makes digital services more productive, but the economy does not fundamentally reorient around them within a decade.

For Poland, AI is an opportunity to upgrade within the existing structure. Manufacturing stands to gain most from AI-driven process improvements, quality control, and predictive maintenance, accelerating a shift toward higher-value, digitally enabled production (ILO, 2026). If Poland can tilt the balance from automation toward augmentation in manufacturing (e.g., through reskilling, task redesign, and complementary investment) it can capture more of the structural upgrading benefit within its dominant sector.

Sectoral VA shares, however, are an incomplete welfare measure. Within each expanding sector, AI simultaneously augments some workers, displaces others and shifts the functional distribution of income toward capital. The distributional implications are examined next.

FIGURE 1.6 AI shifts VA toward knowledge-intensive sectors

Change in GVA share vs BaU, 2035 (pp)



Notes: High-Mobility, E3 scenario.

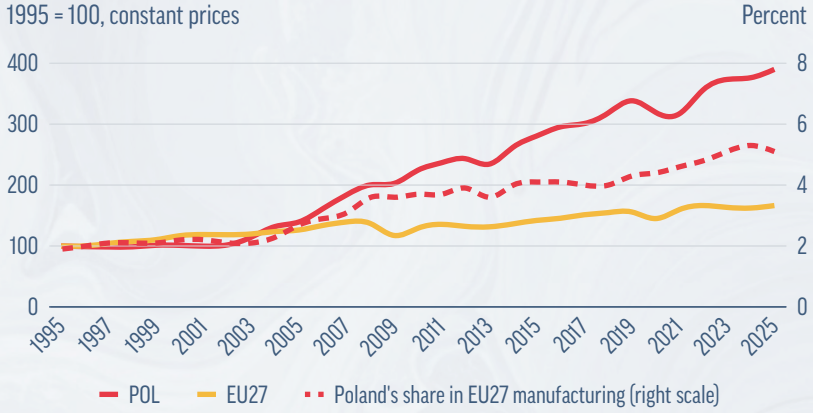
Poland's manufacturing sector

Manufacturing remains one of the pillars of the Polish economy, accounting for about 18% of GVA, above the EU average of 16% (Eurostat, 2025). This places Poland among the most industrialized economies in the EU. The sector is equally significant in terms of employment, employing 19% of the workforce. Notably, while manufacturing employment across the EU has fallen by around 13% over the past three decades, Poland bucked this trend with a 7% increase over the same period.

Poland's current industrial standing is the product of a sustained expansion that began with the transformation of the 1990s. Restructuring, a large inflow of foreign direct investment (FDI), and deep integration into the EU single market after 2004 transformed Polish manufacturing from a post-Soviet legacy structure into a modern node within European value chains. Over three decades, Poland established itself as a key production hub across automotive, electronics, home appliances, and chemicals. A defining structural feature of Polish manufacturing is its exceptional sectoral diversification. Alongside automotive and electronics, food processing, furniture, machinery, chemicals, and pharmaceuticals all hold strong positions. This breadth acts as a natural shock absorber: downturns in one sector are offset by others, supporting macroeconomic stability and reinforcing the economy's overall resilience to external shocks.

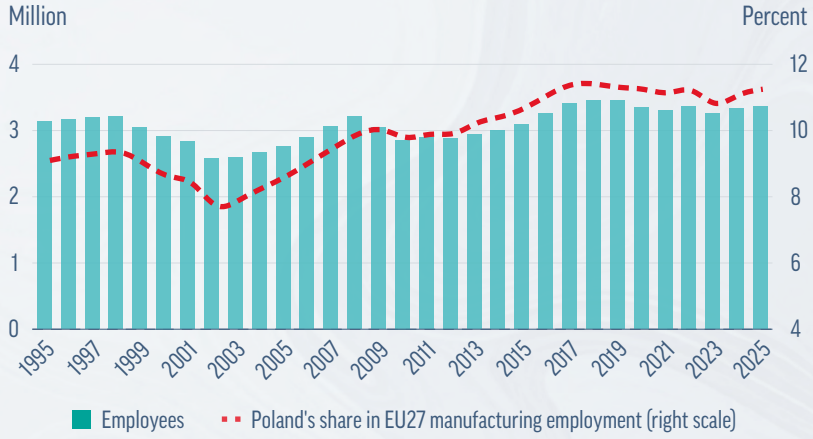
At the same time, Polish manufacturing faces a persistent productivity gap relative to its Western European peers. Polish firms are concentrated in production-stage activities, while R&D, design, and brand management functions tend to remain in Western Europe. VA per worker in Polish manufacturing still stands at well below 60% of the German level. This gap is compounded by relatively low levels of automation and digitalization. With only 78 industrial robots per 10,000 manufacturing workers—compared to over 400 in Germany—robotization density remains well below the Western European frontier (IFR, 2026). AI adoption tells a similar story: just 7.7% of manufacturing firms currently use AI for any business purpose, against an EU average of 17.3% (Eurostat, 2025). The risk is that wage catch-up is outpacing productivity catch-up. As Polish manufacturing wages converge toward Western European levels, without a parallel acceleration in productivity, Polish manufacturing loses its cost advantage—a squeeze that AI adoption could either intensify or mitigate depending on how quickly the sector moves.

FIGURE I6.1 Value added in manufacturing



Source: Based on Eurostat data.

FIGURE I6.2 Employment in Polish manufacturing



Source: Based on Eurostat data.

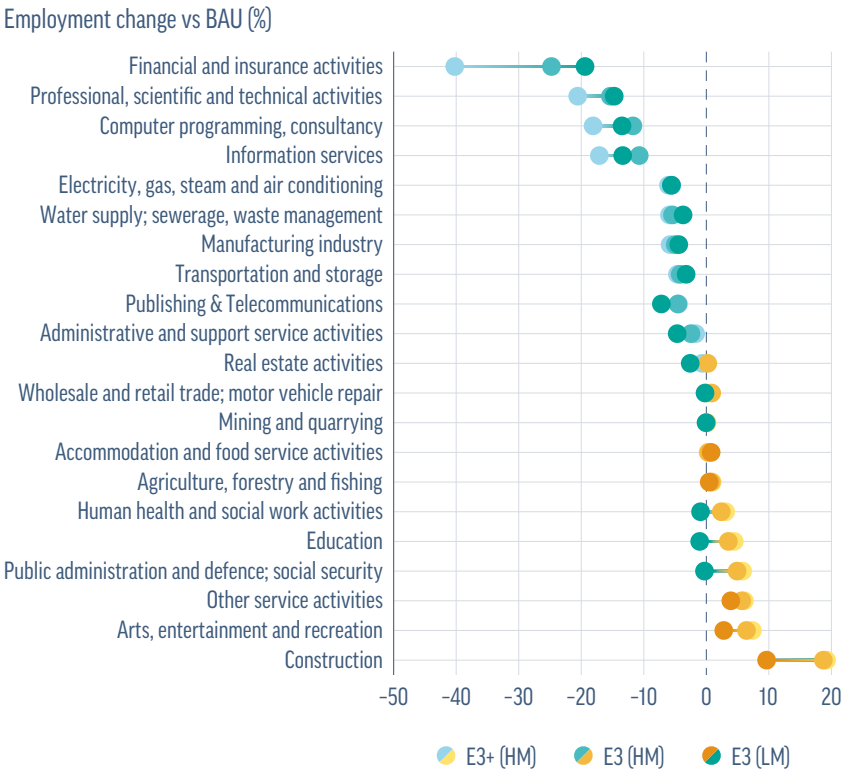
1.2 Employment shifts could be significant, however

AI adoption generates substantial employment redistribution across sectors. Knowledge-intensive sectors—financial and insurance, professional and technical activities, computer programming, and services—experience the sharpest employment losses relative to BAU. Construction, public administration, education, and health see employment gains under the assumption of high labor mobility (Insights #7).

The magnitude of displacement depends on two parameters: *the degree of labor mobility and the pace of AI efficiency improvement.* Under the policy-consistent scenario (E3) the economy-wide net employment effect is near zero (-3,000 jobs relative to BAU by 2035). All else unchanged, under a faster technology efficiency scenario (E3+), presented here as an upper-bound sensitivity, displacement pressures in knowledge-intensive sectors increase, turning the aggregate effect negative (–113,000 jobs). Labor mobility, however, is the decisive parameter. When existing workers and new entrants can reallocate across sectors and occupations, some displacement is absorbed. When they cannot—the low-mobility scenario (E3 LM)—net employment losses rise to around 340,000 jobs. This reflects a broad-based adjustment: displacement intensifies in knowledge-intensive sectors, while sectors that expand under high mobility are unable to absorb labor and instead contract (see Appendix Book for details). In effect, stronger labor mobility reduces potential job losses by roughly two-thirds.

Three points are worth emphasizing. First, real-world AI capability improvements may well exceed the 5% efficiency gain used in the main scenario, making the upper-bound sensitivity not an outlier but a plausible baseline. Second, the near-zero employment effect depends critically on labor mobility; absent it, losses become both larger and more widespread. Third, the resulting estimates may tilt upward or downward depending on dynamics outside the scope of the model. Embodied or physical AI could extend automation to physical tasks and intensify labor market pressures while new sectors/occupations could also reduce the pressure on cognitive workers.

FIGURE 1.7 **AI adoption generates substantial employment redistribution across sectors.**



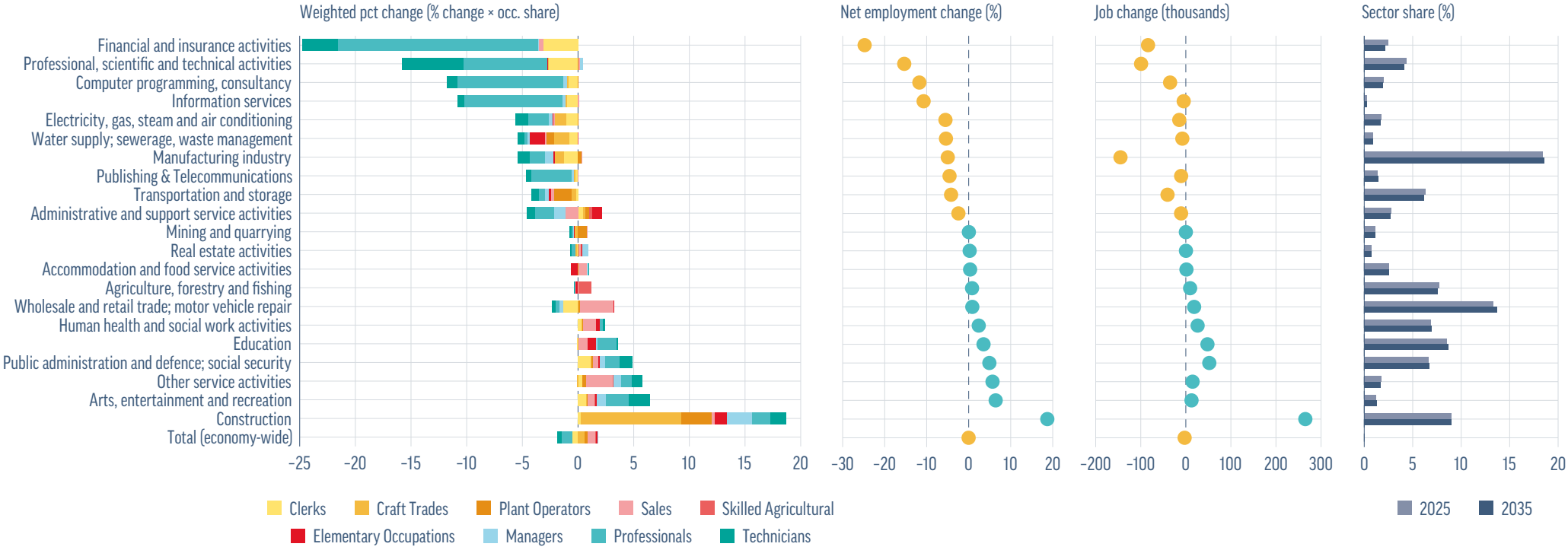
Source: World Bank AI-MANAGE model. 2035 endpoints.

Notes: Labels show E3 (HM) values where |change| ≥ 5%, Sectors sorted by E3 (HM). Economy-wide net employment change vs BAU: E3 (HM) ≈ -3k jobs; E3+ (HM) ≈ -113k; E3 (LM) ≈ -600k. HM = high mobility, LM = low mobility.

AI redistributes employment by occupation, reshaping sectoral composition

The sectoral net employment numbers mask substantial within-sector heterogeneity, particularly in the sectors that lose employment overall. AI-driven job losses concentrate on clerks and professionals in knowledge-intensive sectors—financial (−24.8%), professional & technical (−15.3%), computer programming (−11.7%), services (−10.7%)—where these two occupation groups account for most of the sectoral contraction. At the same time, plant operators, craft trades, and elementary roles drive employment expansion in physical-work-intensive sectors such as construction (+18.7%). Expansion here reflects both reallocation and new job market entrants. The actual pace of this reshuffle in heavily regulated sectors—financial services for example, where compliance, liability, and consumer protection frameworks shape task automation; or sectors with large shares of public employment such as health and education—may differ from the modeled path, which treats regulatory friction as constant across sectors.

FIGURE 1.8 AI adoption generates substantial employment redistribution (high mobility), 2035

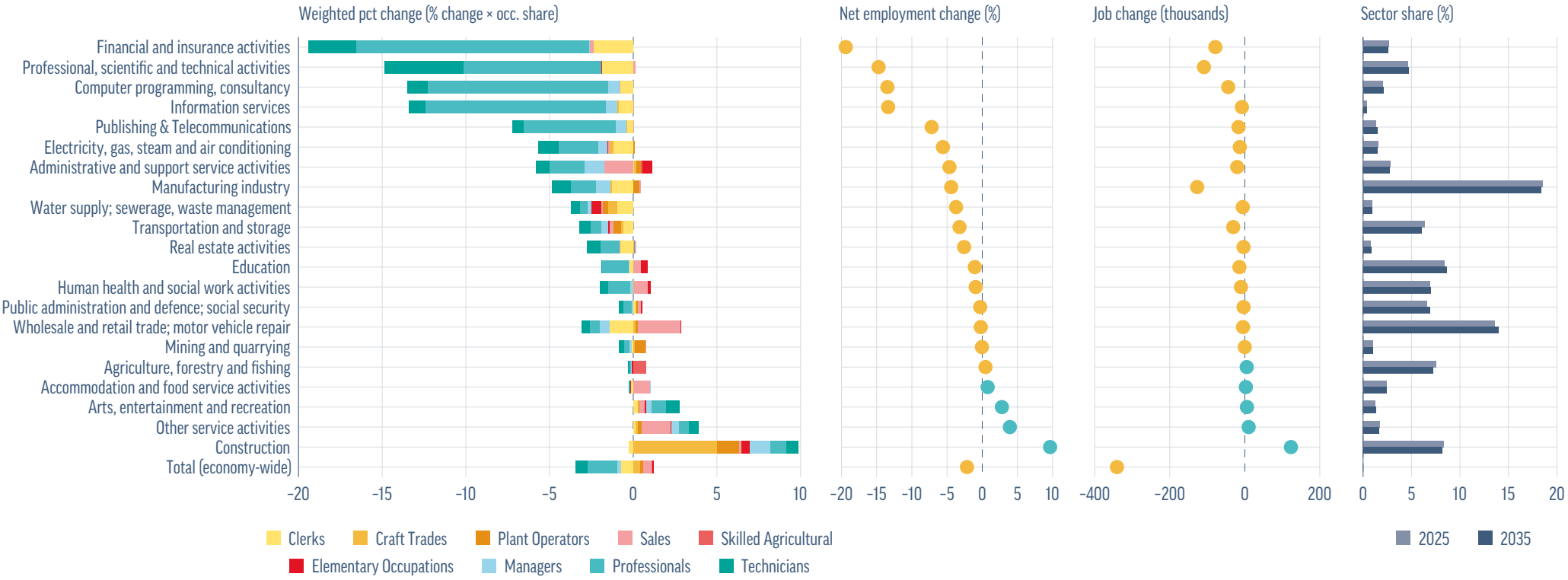


Source: World Bank MANAGE-AI model. Net employment change vs BAU, 2035. High mobility, E3.

Removing frictions is the decisive lever to manage the AI transition

Comparing high and low labor mobility scenarios—with technology and investment held constant—shows that labor market flexibility is decisive for AI's employment outcome. ***Under high mobility***, AI-driven sectoral demand shifts are absorbed without significant net employment loss relative to BAU (-3,000 jobs by 2035), with employment composition shifting toward expanding sectors such as construction. ***Under low mobility,*** the same demand shifts produce a 341,000-job shortfall vs BAU. The 338,000-job differential isolates the cost of frictions in the labor market's overall capacity to adjust—through reallocation of incumbents, attrition not being replaced, entrant composition and lower economic growth. Strengthening the labor market's capacity to adjust as the economy evolves (see Section 3) is crucial for a less disruptive AI transition.

FIGURE 1.9 AI adoption generates substantial employment redistribution (low mobility), 2035



Source: World Bank MANAGE-AI model. Net employment change vs BAU, 2035. E3, Low Mobility.

INSIGHTS #7

AI and labor market dynamics

AI is reshaping labor markets at a pace that challenges both workers and policy makers. The extent to which individual workers are exposed to AI-driven change depends not only on their occupation but also on the specific tasks they perform within that occupation and on the broader economic context in which they work.

Theoretically, AI's impact on labor operates through three distinct channels :

1. **Substitution (or automation).** Where AI can replicate the full task content of an occupation (e.g., as in basic data processing), it displaces workers directly, reducing labor demand in affected roles unless output growth compensates. The displacement effect is most pronounced in occupations with high shares of codifiable, repetitive cognitive tasks, where the cost of AI substitution falls below the cost of human labor. Acemoglu and Restrepo, 2018 formalize this as the **"displacement effect"**.

2. **Complementarity (or augmentation).** For many occupations, AI automates specific sub-tasks while leaving others (e.g., those requiring judgment, creativity, or relational capacity) in human hands. Autor, 2015 documents this pattern in the context of earlier automation waves, showing that routine task displacement restructures rather than eliminates occupations, concentrating labor in non-routine tasks that machines cannot easily replicate. The augmentation of remaining labor raises effective productivity, but with two distinct outcomes. Where labor retains a genuine comparative advantage, wages and employment both rise—**the reinstatement effect** of Acemoglu and Restrepo, 2019. Where AI instead lowers the skill threshold for previously specialized tasks, employment may rise but the wage premium erodes as task scarcity falls—**an expertise-reducing dynamic.**

3. **New task and job creation.** Acemoglu and Restrepo, 2019 show that technological change also generates a reinstatement effect at the extensive margin: entirely new tasks emerge in which labor holds a comparative advantage over machines, creating demand for occupations that did not previously exist (Autor, Levy, and Murnane, 2003). Job creation due to new occupations and tasks emerging from the technological revolution is currently not modeled in MANAGE-AI (see Appendix Book).

The net employment effect depends on the relative strength of displacement, reinstatement, and new occupations/sector creation, as well as the time horizon, the pace of diffusion, and the economy's capacity for labor mobility and retraining. A further layer of complexity (not modeled) arises from the global mobility of jobs: when AI-driven displacement outpaces domestic skills adjustment, the resulting competency gaps can trigger cross-border task redistribution, shifting roles toward economies with more suitable skill profiles or lower transitional costs. The speed of AI diffusion is therefore not merely a domestic concern but a factor reshaping comparative advantage and global task allocation in real time. These are not automatic adjustments—the uneven distribution of gains and losses makes AI's labor market impact fundamentally a structural policy challenge.

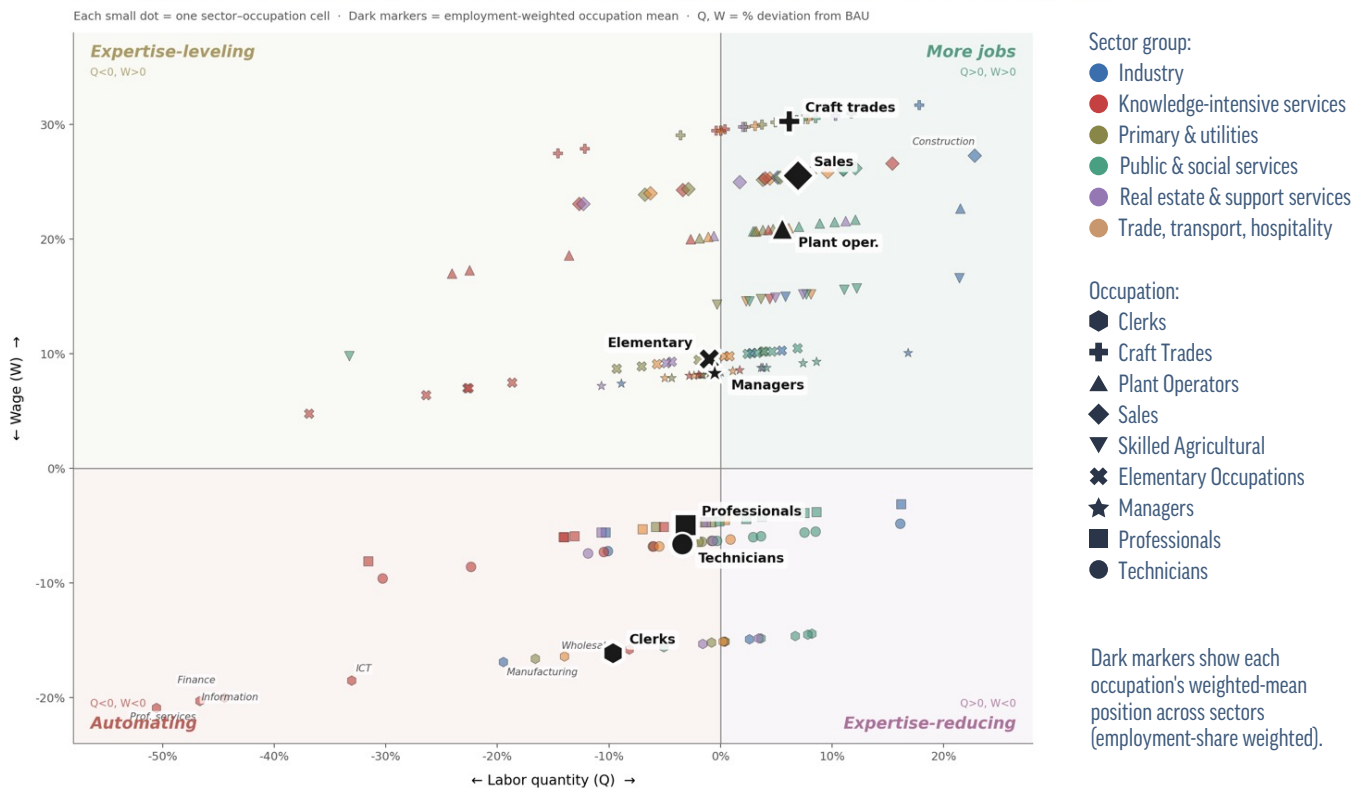
Winners and losers: AI reshapes labor demand unevenly

In cognitive occupations, not all workers are affected in the same way. Mapping Poland's occupation-sector combinations onto the Acemoglu-Restrepo framework (Insights #7)—which classifies each combination by whether AI raises or reduces employment and wages—reveals four distinct experiences.

One group faces automation pressure: both jobs and wages fall relative to BAU. Clerks in knowledge-intensive services absorb the sharpest losses—employment falls roughly 45% in professional services, 47% in services, and 45% in finance, with wages 20% below BAU. Professionals and technicians in the same sectors follow a similar pattern. **A second group experiences expertise-leveling: jobs shrink but surviving workers earn more,** as remaining tasks become harder to replicate and command a premium. **The third and largest group benefits from new job creation driven by increased demand.** Craft trades see a rise in employment and wages across most sectors, with construction leading, as do sales workers in construction, education, and public administration. **Finally, a fourth, smaller group faces expertise reduction: more jobs at lower wages,** as sectors absorb displaced workers. Construction professionals and technicians gain in employment but lose marginally in wages; public administration and education technicians show the same pattern at smaller magnitudes.

See Appendix Book for definition of physical and cognitive occupations.

FIGURE 1.10 Not all workers in cognitive occupations are affected by AI in the same way



Notes: High labor mobility; E3. Only cognitive occupations-sectors. See Appendix for physical occupation-sectors.

Winners and losers: the AI dividend accrues almost entirely to capital

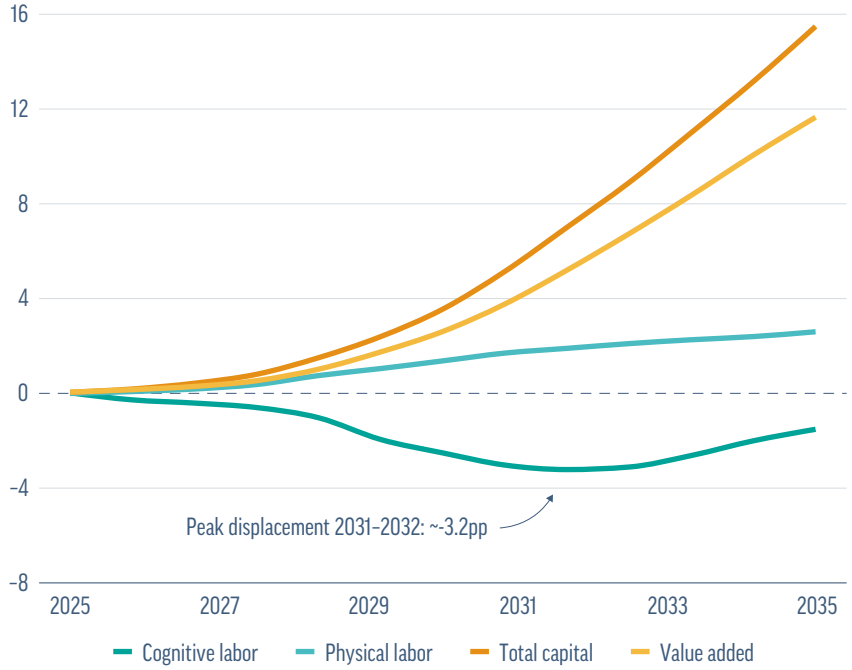
AI adoption generates substantial value added but the distribution of that gain between capital and labor is highly unequal. Total capital returns rise by 15.1 pp versus BAU by 2035, effectively capturing more than the entire VA gain. Total labor income, by contrast, ends the decade essentially flat relative to BAU (-0.02 pp). The composition of capital gains reveals the mechanism. Returns on intangible capital (i.e., software, data, and AI systems themselves) rise by over 100 pp versus BAU by 2035, reflecting the large accumulation of AI-specific assets as adoption deepens. Returns on tangible capital rise by 11.1 pp, driven by hardware investment in AI infrastructure and physical capital deepening in production-intensive sectors.

Within labor, the story is not uniform. Physical workers (e.g., construction workers, care workers, and manual operatives) see their labor income rise by 2.6 pp above BAU by 2035 as AI-driven economic expansion creates demand for roles that cannot be automated. Cognitive workers (e.g., analysts, professionals, clerks, and technicians) see the opposite outcome (1.3 pp below BAU). The cognitive labor path captures the adjustment trajectory: displacement concentrated in the early and middle period, partial recovery later, but never returning to BAU levels within the decade. Overall, the average real wage in the economy is 4.4% higher in 2035 than in BAU. However, the wage premium associated to cognitive jobs shrinks from twice the average wage for physical jobs to a 46% premium. Job creation in new sectors and occupations as well as physical AI (not modeled) could alter these dynamics.

AI's impact extends well beyond income distribution, reaching into dimensions of meaning, identity, and social connection. Among workers, it favors those whose tasks are hardest to automate. Without deliberate redistribution through taxation, social protection, and wage policy, these dynamics could widen inequality even as the economy grows. This is precisely the context in which the policy priorities in Section 3 matter to ensure broader sharing of AI-driven dividends. The income story is, however, only part of what is at stake. Beyond wages and employment, AI-driven displacement threatens dimensions of welfare that standard economic accounting does not capture (i.e., the meaning, identity, and social connection that work has historically provided), and whose erosion carries costs that neither income transfers nor aggregate productivity gains can fully offset (Insights #8).

FIGURE 1.11 The AI dividend mostly accrues to capital

Income by factor, % deviation from BAU, percentage points



Notes: High labor mobility; E3.

AI, the future of work, identities and meaning

The economic consequences of AI are increasingly well-documented. Less visible, but no less consequential, are the philosophical and psychological dimensions: *what happens to human identity, purpose, and well-being when work itself is transformed or replaced?*

Work has historically been a primary vehicle for meaning in life—distinct from the more abstract question of the meaning of life. Danaher and Nyholm, 2021 argue that AI-based automation threatens this by creating "achievement gaps": as machines take over tasks, the causal link between human action and outcomes is severed, undermining the conditions necessary for workplace achievement—the value of the output, the contribution of the worker's skill, the effort invested, and the voluntariness of the act. Even modest near-term scenarios, for example, a radiologist whose role shifts to correcting AI errors, a plumber guided by AI diagnostics, dilute the achievement value that work once conferred. For Poland, where occupational and craft identity have historically anchored working-class communities, this dimension deserves particular attention.

One buffer lies in *job crafting*—the process by which workers proactively redefine the boundaries of their jobs to sustain meaning even in routine or changing roles, for instance by emphasizing connections with colleagues or the people they serve (Wrzesniewski and Dutton, 2001; Berg, Dutton and Wrzesniewski, 2013). This capacity is real but unevenly distributed: workers less inclined to job craft are disproportionately exposed to meaning loss when AI restructures their task content. Another potential response—Danaher's, 2019 "virtual utopia" of games and structured challenges as substitutes for work-based achievement—offers genuine insight but faces a fundamental limitation: competitive goods are positional, raising the question of whether there is enough meaning to go around.

The psychological costs of labor displacement are also likely to be unequally distributed. Employment provides not just income but structure, social connection, and protective behavioral incentives that income transfers alone do not replicate. The workers most at risk of meaning loss from AI disruption may therefore not be average workers adapting to new task demands, but specific groups for whom the non-economic functions of work are most critical.

Beyond individual well-being, AI-driven labor displacement carries relational risks. Societies that tie social status to productive contribution may struggle to sustain equal regard between those whose labor remains economically essential and those whose labor does not—even where material redistribution is secured (Danaher, 2019; Susskind, 2020). Universal basic income pilots offer cautiously positive signals on well-being, but their applicability is limited: they measure the effect of additional income in economies still driven by human productivity, not the consequences of decoupling productivity from mass labor altogether. The honest conclusion is one of deep uncertainty—and a case for adaptive rather than fixed policy making.

Based on Baker, D.J. and Manley, D. "The Value of Work in the Age of AI." Presentation at the Warsaw Workshop on AI for the World Bank Group, March 2025.

1.3 AI will mostly change tax composition

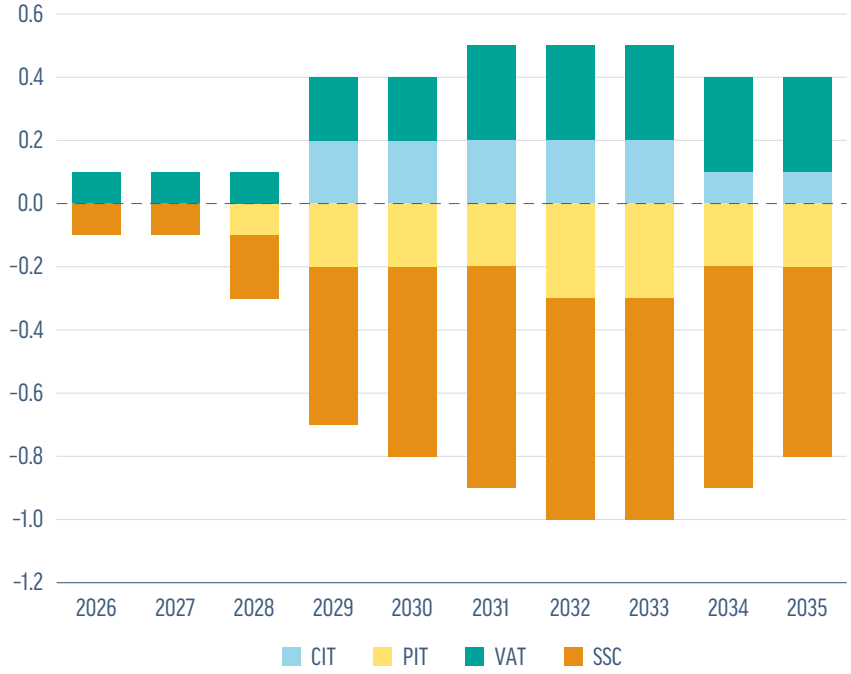
AI reshapes tax bases and erodes the long-run viability of labor-based taxation (Insights #9). For Poland under the policy-consistent scenario (E3), aggregate revenue stays close to BAU, but its composition shifts meaningfully. Personal income tax (PIT)—currently the main direct tax—contracts by 0.2% of GDP by 2035, while social security contributions (SSC) fall by 0.6%. Gains in corporate income tax (CIT) (+0.1%) and value added tax (VAT) (+0.3%) partly offset these losses. VAT thus consolidates its position as the largest single source of tax revenue, with the increase driven by stronger investment demand even as private consumption softens. Public consumption is held constant as a share of real GDP, reflecting AI-driven efficiency gains in the public sector—including in tax administration and compliance. Therefore, fiscal balance improves by a cumulative 2.7% of GDP over 10 years, translating into an average 7.8 pp reduction in the public-debt-to-GDP ratio over 2030–2035.

Labor market shifts explain the decline in PIT and SSC. Labor income ends the decade essentially flat in the policy-consistent scenario relative to BAU. The resulting decline in the labor share translates into lower PIT and SSC revenues—likely understated, as the model assumes a proportional rather than progressive PIT system.

Trade and manufacturing sectors are the biggest contributors to CIT revenue. They remain in the top two positions over time, but their shares decrease while the share of taxes paid by the construction sector rises significantly -from 11.1% in 2025 to 15.3% in 2035, nearly matching the trade sector.

FIGURE 1.12 CIT and VAT additional revenue will not be large enough to compensate for the losses from PIT and SSC.

Tax revenue decomposition, % deviation from BAU, percentage points



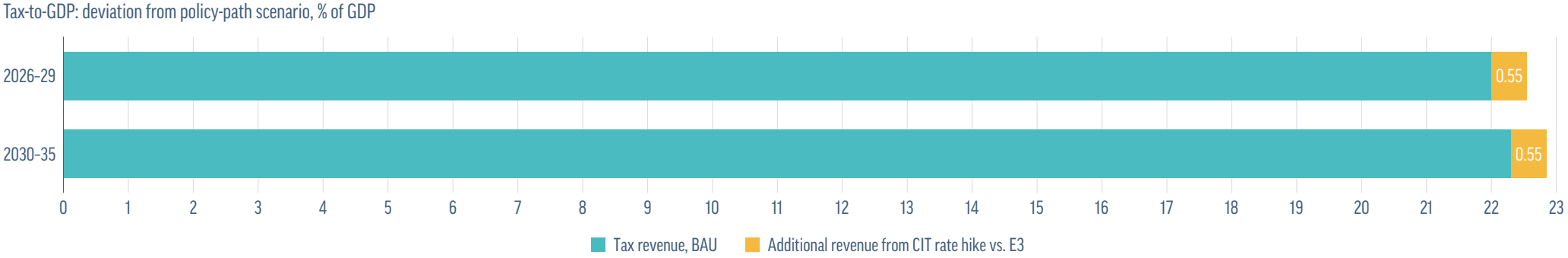
Notes: High Labor Mobility; E3.

AI-driven income shifts strengthen the case for taxing capital, but design matters

AI-driven income shifts change the relative attractiveness of tax instruments. Standard public finance literature ranks CIT as more growth-distortive than consumption or property taxes (OECD, 2010), but that ranking assumes stable factor shares. Because most AI-driven gains accrue to capital owners that are usually taxed at a lower rate (Insights #9) while the labor tax base narrows, shifting more of the tax burden onto corporate income can create a fairer tax system but also a more productive tax system, where CIT becomes a more stable revenue anchor. Simulating a 2 pp increase in the effective CIT rate coming from a combination of base-broadening measures and an increase in the statutory rate (currently at 19%, versus an OECD average of 24%) generates additional revenue of roughly 0.5–0.6% of GDP per year. When these gains are saved, the fiscal multiplier associated with this policy is positive: by 2035, real GDP is marginally higher (+0.2%) than under the policy-consistent path (E3), as lower government borrowing crowds in private investment through lower interest rates, more than offsetting the disincentive effect of higher taxation on profits.

Other policy combinations are available, with different distributional and growth implications. First, the additional CIT revenue could finance public investment on a fiscally neutral basis. Simulation results show that GDP remains above the policy-consistent path (E3) although a partial crowd-out of private investment lowers the effect on GDP relative to the first simulation. Second, we explore what happens if the additional CIT revenue funds a corresponding PIT cut—equivalent to lowering the effective PIT rate by 1 pp. This option however produces the smallest household consumption gain, because the drag from slower capital accumulation partially offsets the direct income boost to households. In all these scenarios, the long-run debt-to-GDP ratio settles around 67%, in line with the policy-consistent path. Relative to BAU, with adequate tax policy changes, AI diffusion could support debt reduction in the long term.

FIGURE 1.13 Debt reduction accelerates when profits are more heavily taxed and saved in the budget (higher CIT simulation)



Notes: High Labor Mobility E3; CIT effective tax rate increased by 0.2 pp and saved into the budget.

AI implications for public finance

Economists are increasingly investigating the potential consequences of AI on public finance. Initial analyses have focused on the use of AI to better capture AI-induced productivity gains in the public sector, usually through analysis of how to leverage AI tools to boost the efficiency of the tax administration–tax audits in particular—and of public spending–more efficient financial management as well as more granular analysis of the effects of social programs and their fiscal impact (Harris et al., 2025). More recently, scholars have started looking at how the tax system should respond when technological change reshapes both the mechanisms of production and the distribution of income.

On the revenue side, three potential transmission channels can be identified. At the most aggregate level revenue gains from higher economic growth, even if constant as a share of GDP, can either support fiscal consolidation by allowing spending to grow less than nominal GDP, without penalizing service delivery, or they can be redistributed using different fiscal instruments. These gains can be used to soften the two dimensions of inequality potentially arising from economy-wide usage of AI: within-labor inequality and labor-capital inequality.

Potential changes in the labor market (wages and occupation) affect PIT bases and its progressivity. AI may change wage distribution in a way that depends on the complementarity between software capital and types of occupation, so the optimal response depends on where the gains from technological change accrue (Bastani and Waldenström, 2024); for instance, middle-income cognitive jobs and the associated tasks may be disappearing, creating a polarization into high and low-income segments; at the same time, low-income workers may become more productive too. While this channel could be very interesting for Poland, whose tax system is less progressive than for the rest of the EU (World Bank, 2022), it is important to keep in mind the potential drawbacks of overly progressive taxation and universal basic income schemes on work incentives and economic growth. Moreover, AI may increase the presence of non-standard jobs (gig work, freelancing, platform work) which are both paid less and more difficult to tax.

Finally, recent analytical work focuses on the implications for tax income of an expected progressive reduction of the labor share, but with some divergent recommendations. Korinek and Lockwood, 2026 argue that, as AI progressively reduces the importance of human labor in production, tax systems may need to shift away from conventional labor-tax bases in favor of other. They suggest that governments could start by increasing reliance on consumption taxes with increased commodities differentiation, such as token taxes or digital and robot services taxes, and when the economy becomes AI-dominated to shift toward direct capital taxation of AI companies. Huynh, Mittal, & Frank, 2025 propose a four-dimensional framework to identify new sources of income: Feasibility, Incidence, Resilience, Incentives. On this basis they suggest land value taxes and traditional VAT as the most promising ones, while automation and digital services taxes are considered easy to pass on to consumers and workers.

2 AI READINESS: POLAND'S STRENGTHS AND GAPS

The policy-consistent (E3) dividend materializes only if a specific set of enabling conditions holds. Chapter 2 assesses how far Poland is from meeting them.

Are firms, workers and institutions ready?

2.1 Are firms in Poland ready for AI?

Poland is behind and the gap is not closing fast enough. Only 8% of Polish firms use AI for any business purpose, against 17% in the Czech Republic and 28% in Austria. The Scandinavian and Benelux economies are pulling further ahead. Critically, this is not a story about economic structure: even in Poland's ICT sector, adoption rates are half those of comparable EU economies (Eurostat 2025). Poland's firm landscape is divided by a different structural fault line that aggregate adoption figures obscure: Multinational Enterprise (MNE) subsidiaries will largely receive AI as a headquarter decision (e.g., integrated solutions deployed across the group). Domestic SMEs face a qualitatively different challenge: navigating the full adoption decision themselves, from data usability and system integration to implementation choices.

Three questions frame our assessment of Polish firms' AI readiness:

1. Are Polish firms adopting AI and to what extent?
2. How is Poland positioned in the global AI value chain (AIVC)?
3. What happens to the business services sector (BSS)—one of the largest in Central and Eastern Europe?

Overview: Adoption is lagging and the binding constraint is management quality, not technology access—a challenge that falls unevenly across the MNE/local firm and firm size divide. Poland is attracting AI investment but from a geographically concentrated base, through brownfield expansion rather than new entry, and with major global AI investors—Sweden, China, Canada—yet to engage. Consistent with the macroeconomic results, the business services sector faces one of the most immediate and concentrated exposures. AI-driven automation threatens its current model while simultaneously opening a window to move up the value chain, if firms and workers adapt fast enough. **Achieving the policy-consistent scenario (E3) requires addressing these issues.**

FIRMS

8%
of Polish firms use AI (EU avg. 17%)

4×
SME adoption gap vs. frontier EU firms

25/27
EU ranking, Management Index

U.S.
is the main AI-related MNE investor

1/5TH
of work processes in the BSS are currently automated

Polish firms have a great opportunity to accelerate AI adoption and catch up with leading EU countries

Only 8% of Polish enterprises use AI for at least one business purpose, compared with 17% in the Czech Republic and 28% in Austria. Scandinavian and Benelux economies are at the European frontier and pulling further ahead as adoption accelerates, raising the risk that Poland's productivity, competitiveness, and export performance fall behind faster-adopting peers.

This gap is not driven by economic structure. It appears across sectors—including ICT—and firm sizes. While AI adoption among ICT firms has more than doubled in many countries over the past two years, only about one third of Polish ICT firms use AI, compared with nearly two thirds in Scandinavian economies and more than half in several middle-income EU countries such as the Czech Republic, Croatia, and Lithuania.

FIGURE 2.1 Only 8% of Polish firms are using AI technologies for at least one business purpose

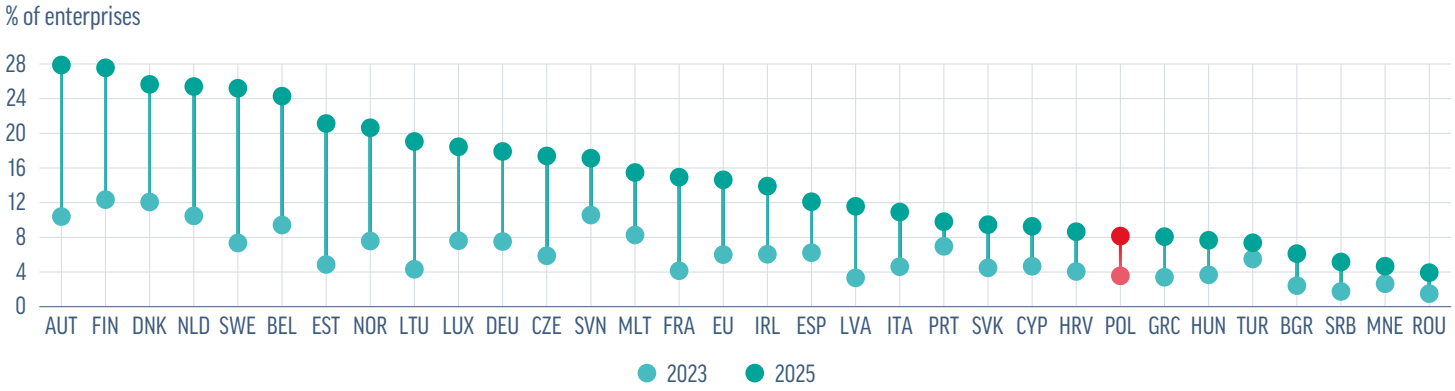
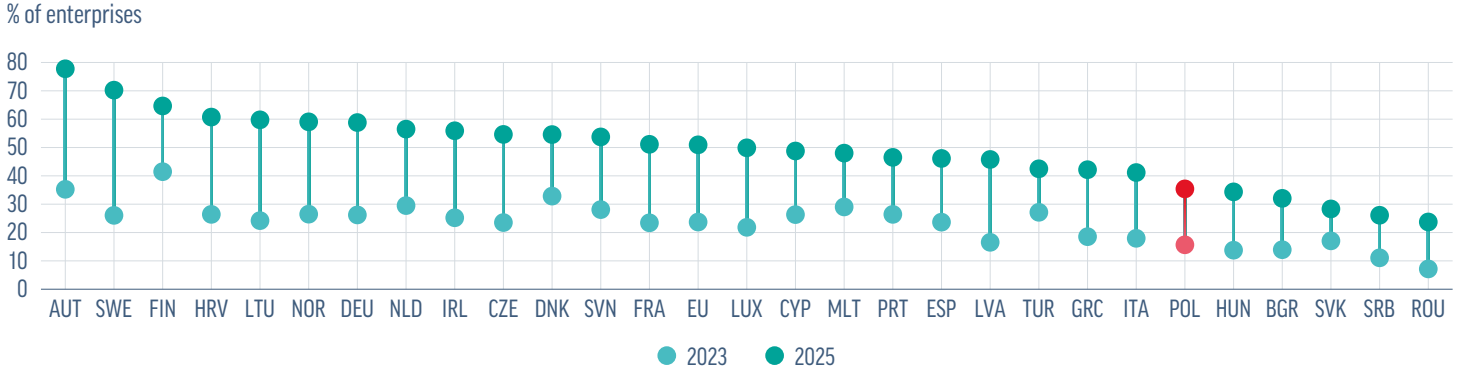


FIGURE 2.2 Only about ⅓rd of Polish ICT firms use AI compared with nearly ⅔rd in frontier EU countries.



Source: Eurostat, Digital Economy and Society database, 2025

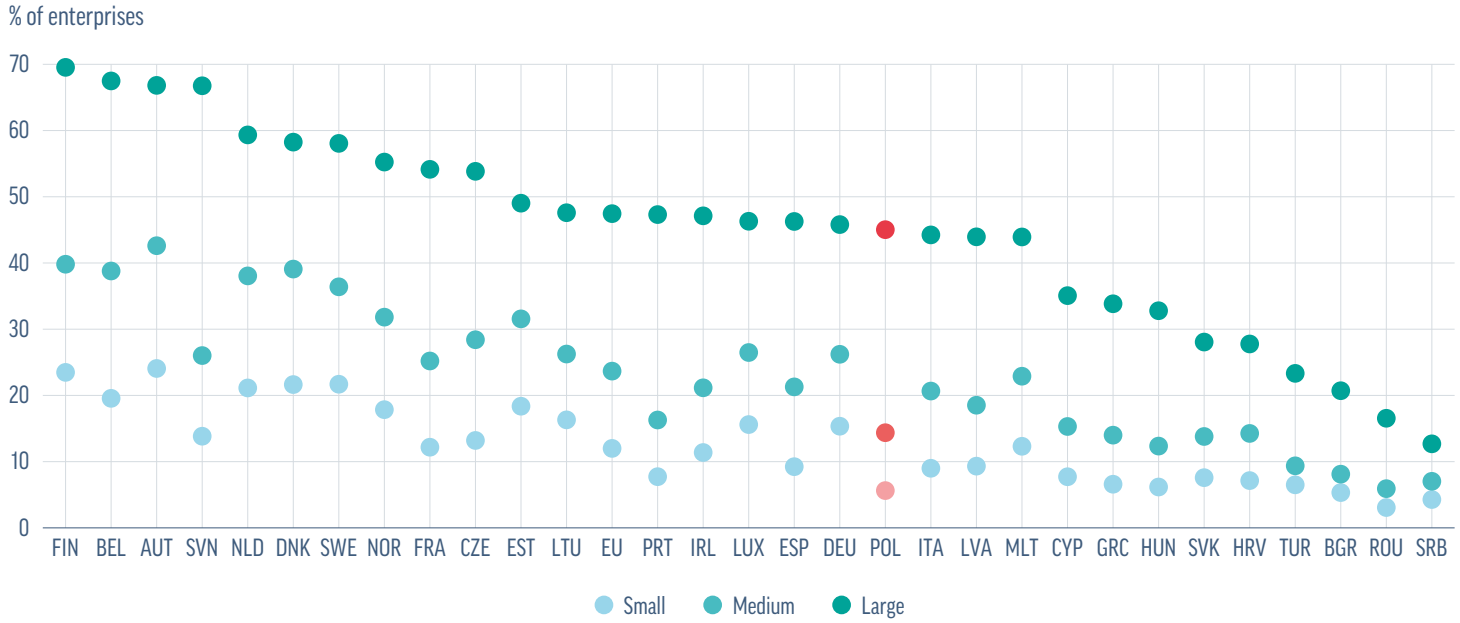
Notes: Business processes refer to marketing or sales, production or service processes, administration or management, logistics, ICT security, accounting and finance management, R&D and innovation activity; among all enterprises with 10 persons employed or more.

A small firm in Poland is 4 times less likely to use AI tools than a small firm in Finland or Austria

Among large firms the gap is narrower: a large Polish firm is only about 1.5 times less likely to use AI than large firms in frontier economies such as Belgium, Finland, or Austria.

This matters for Poland because the enterprise structure is skewed toward micro and small firms relative to the EU-15, which lowers aggregate productive AI uptake across the economy.

FIGURE 2.3 **Compared to EU peers, small enterprises have a harder time using AI than larger firms**



Source: Eurostat, 2025

Notes: Business processes refer to marketing or sales, production or service processes, administration or management, logistics, ICT security, accounting and finance management, R&D and innovation activity; among all enterprises with 10 persons employed or more.

See **Appendix Book** for on regional differences in AI adoption in Poland

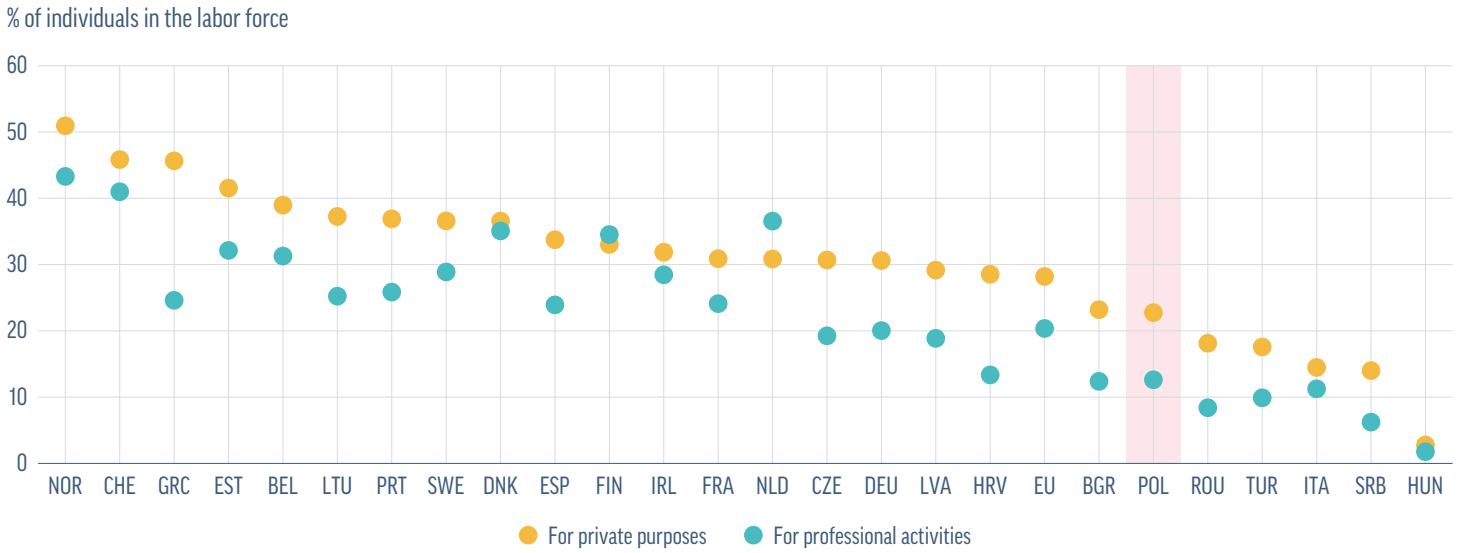
In Polish companies, AI is often seen as a tool for individual use instead of a broader organizational asset, which slows down its adoption

Business owners often see AI as a bottom-up initiative driven by employees rather than a management-led transformation (PIE, 2025). Consistent with this limited engagement, only 4% of firms report considering AI implementation, with the main barriers cited as high costs and limited skills (Statistics Poland, 2025). However, firms that have already adopted AI report cost concerns far less frequently, suggesting perceived barriers may exceed actual ones (PIE, 2025).

This "individual-skill" framing is reflected in usage patterns: only 10% of Polish employees use AI at work, compared with about 20% who use it privately (Eurostat 2025). In countries with stronger firm-level adoption—such as Finland, Norway, and the Netherlands—the gap between personal and workplace use is smaller. Personal AI use is also higher in leading economies, reaching 57% in the United States (Business Trends and Outlook Survey 2025), and is associated with stronger firm-level diffusion.

Shadow AI use—employees using AI tools for work through personal accounts, without their employer's knowledge—shows up clearly in the Polish data. NASK data (2025) show that 8.4% of workers use a personal genAI account that their employer does not know about, almost matching the 8.9% who do so with employer awareness. Among workers bringing their own AI to work, in other words, roughly half are doing so in the shadows. . This is less a compliance failure than a signal of structural mismatch: employees are ready, organizations are not. The gap between private and professional AI use is not just an adoption story, it is a governance and leadership challenge.

FIGURE 2.4 **Business owners often see AI as a bottom-up initiative**



Source: Eurostat, 2025

Notes: Business processes refer to marketing or sales, production or service processes, administration or management, logistics, ICT security, accounting and finance management, R&D and innovation activity; among all enterprises with 10 persons employed or more.

AI adoption without a plan

Qualitative evidence suggests that firms generally lack formalized AI implementation plans or deliberate identification of where AI would be most valuable. The use of new tools is driven instead by ad hoc, localized experimentation by individual employees or teams. The absence of top-down strategies at the firm level is often treated as a natural state of affairs, reflecting the fast-moving nature of emerging technological solutions. At the same time, AI adoption frequently encounters resistance from long-serving employees.

Source: Polish Economic Institute, 2024.

> We don't really have a roadmap. It's more about watching what is happening. Individual teams were simply implementing specific solutions on their own. No one was really suggesting anything to us—but at the same time no one was blocking it either.

> One unfortunate side effect was that some employees resisted—their skepticism escalated to the point where disciplinary measures had to be taken. They refused to work, fearing that too much data about their work would be exposed.

> The president came in and said that these new AI tools were now available and asked us to suggest where we could use them—if you are not moving forward, you are falling behind.

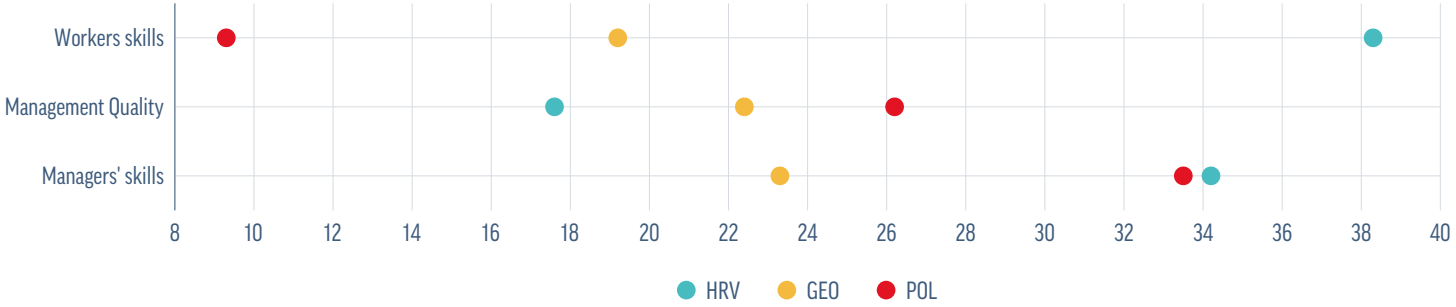
Limited management capabilities continue to be the primary barrier to productivity-enhancing adoption and use of AI

Poland ranks 25th of 27 EU states on management quality. On the World Bank Management Practice Index, Polish firms score 43/100 vs 55 in high-income economies and the low 60s in EU leaders such as Czechia and Denmark, evidence of a structural gap.

In most peers, worker skills explain most differences in firms' digital intensity; in Poland, management quality is the binding constraint, explaining about 35–50% of the 10th–90th percentile gap. Drivers include: (1) family-owned, domestically oriented firms with informal governance and thin professional management; (2) limited international exposure (exporters/foreign-owned firms score about 15 points higher); and (3) small firm size, reducing returns to formal performance-management systems.

FIGURE 2.5 Management quality explains most of Poland's digital intensity gap

Share of the variation explained between firms in at the 10th percentile of digital intensity and firms at the 90th percentile (%)



Source: TIDES of Change: Igniting Productivity Growth in Europe and Central Asia. Europe and Central Asia Studies (World Bank 2025). Notes: Total variation explained is smaller than sum of bars, due to interactions between variables. Workers' skills are measured by the innovation and skills index, which combines the college-educated percentage of the workforce, the share of staff working in research and development, and recent equipment and software modifications. Management quality is measured by the managerial quality index, which combines formal incentives, performance indicators, and nonfamily business status. Managers' skills are measured by the management human capital index, which combines managers' education and experience. The data for Poland are from 2021, and the data for Georgia and Croatia are from 2022.

Internationalization helps but is not sufficient: foreign-owned Polish firms still trail comparable Czech firms. World Bank evidence from Poland shows financing plus a 12-week management intervention raised digital-tool adoption by 12.5%, while financing alone had no effect. It is management quality that determines whether firms move from surface-level AI adoption to intensive, productivity-enhancing use—supporting policies that build managerial capability alongside tech access (see Section 3). This is decisive if Poland is to benefit from the higher growth dividends possible from AI adoption (E3 scenario).

MNEs play a crucial role for Poland's participation in the AI Value Chain (AIVC)

Under the policy-consistent scenario (E3) discussed earlier, activating the FDI channel alongside domestic enterprise savings lifts 2035 GDP to 10.9% above BAU; 3.3 pp above a similar scenario relying only on domestic enterprise savings. The MNE agenda is a macro question, not only a sectoral one.

FDI has been fundamental to Poland's economic development for decades, and AI-related FDI is now central to its next growth phase. Since 2000, Poland has accumulated an inward FDI stock of more than $320 billion, with annual inflows averaging over 3.5% of GDP (National Bank of Poland, 2025). Poland's investment profile is gradually shifting from low-value added activities toward knowledge-intensive activities, with a growing number of MNEs establishing research centers and innovation hubs. Attracting AI-related FDI will be critical to consolidating this transition, integrating Poland into global innovation networks, creating high-value jobs, and accelerating technological upgrading.

Global investment is increasingly oriented toward AI, and nearshoring is reshaping where that investment lands. AI firms captured 61% of global VC in 2025 — almost $260 billion out of $430 billion- more than doubling AI's share since 2022 (OECD, 2026). The United States captures about 75% of global AIVC deal value. On the supply chain side, 56% of large firms invested in nearshoring or reshoring in 2025, up from 42% in 2024 (Capgemini, 2025).

Poland's position in the AIVC is dominated by the Application segment (Section 3). This is not a weakness—application-layer AI is where productivity gains are largest, entry barriers are lowest, and Poland's existing strengths in skilled labor, sectoral diversity, and software development are most relevant. The strategic challenge is different: how to deepen that position, capture more of the value it generates domestically, and avoid excessive dependency on a narrow set of foreign foundation providers. These questions have direct implications for FDI attraction, skills policy, and public R&D investment; all of which are necessary if Poland is to obtain the largest growth dividends from AI adoption.

Multinationals and the AIVC

Understanding who invests in AI and where in the value chain requires first mapping the global structure of the industry and the types of firms that operate within it. The AIVC is highly concentrated at the top and fragmented at the bottom. A narrow set of foundation firms dominate the **enablement** and **development layers**, driven by massive upfront capital costs, economies of scale, network effects, and vertical integration (Gelvanovska-Garcia and Rossotto, 2024). These firms increasingly span multiple layers. The **application layer** is different: entry barriers are orders of magnitude lower, it touches virtually every sector, and success depends on industry knowledge rather than technical innovation. This sustains a large, diverse ecosystem of SMEs and startups.

Results from this section derive from a World Bank global investors' survey. The survey covers three value chain segments, following UBS, 2024. The **enablement segment** is the backbone of AI: semiconductors, chip design, cloud infrastructure, data centers, and power supply. The **development segment** is the intelligence layer: generative AI algorithms, large language models, and data assets. The **application segment** embeds AI into specific sectors and tasks—co-pilots, personal assistants, and industry-specific solutions.

See **Appendix Book** for details on sampling size and survey design.

ENABLEMENT

Key players include ASML, TSMC, NVIDIA, AMD, SK Hynix, and the major cloud providers (AWS, Azure, Google Cloud, Alibaba Cloud).

DEVELOPMENT

Key players include LLM developers such as Google and Baidu, data and model infrastructure providers such as MongoDB and Snowflake, and data asset holders such as Meta and Alibaba.

APPLICATION

Key examples include enterprise co-pilots (Microsoft 365 Copilot, Google Workspace Gemini), software development tools (GitHub Copilot, Amazon Code Whisperer), and creative tools (Adobe Firefly).

TOP 20 FIRMS control 30–40% of global segment value

US CAPTURES 75% of global AIVC deals

92% OF MNEs in this segment serve B2B use cases

Poland's AI investment potential remains largely untapped

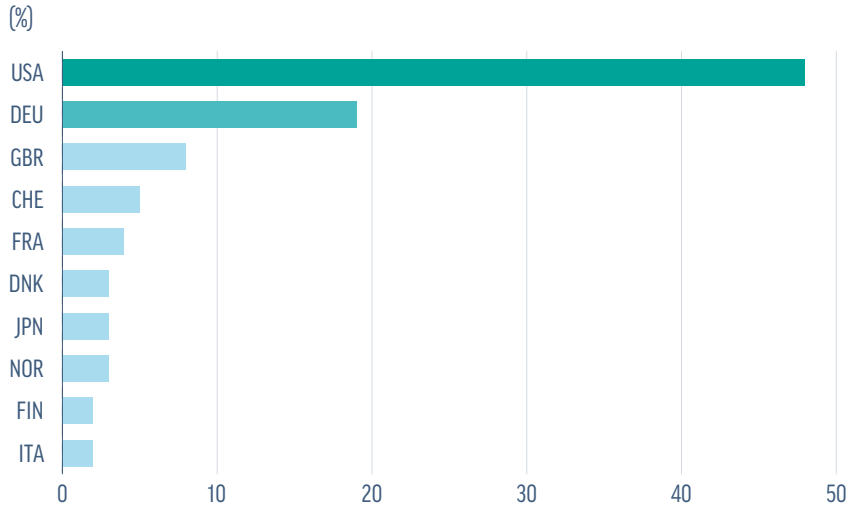
Poland is moderately attractive to AI investment, with significant untapped potential that sets it apart within the Central and Eastern Europe (CEE) region. Surveyed MNEs rate Poland at 5.2 on a 1–10 attractiveness scale, and while 63% of firms are aware of or actively considering the country, this middling score reflects a gap between Poland's genuine assets and its ability to convert them into investment decisions.

The greatest competitive advantage lies in its deep and established pool of technical talent, reinforced by strong regional demand and cost efficiency. The country boasts the largest IT workforce in CEE and the highest number of programmers in the region—a factor cited by 65% of current investors as the primary reason for choosing Poland. Growing local and regional demand for AI solutions also attracts investors, while proximity to Western European markets and the governance benefits of EU membership make Poland a compelling nearshoring option for firms prioritizing data security and regulatory alignment. Competitive operating costs relative to Western Europe remain an additional draw, particularly for companies scaling AI operations without sacrificing quality.

Poland's existing investor base is heavily concentrated among U.S. and Western European firms, with investment activity driven primarily by brownfield rather than greenfield operations. The United States accounts for about half of all current AI investors in Poland, followed by Western Europe at 34%. Notably absent are Chinese MNEs, which constitute the second-largest group of AI investors globally yet have no meaningful presence in Poland to date. Equally telling is the nature of investment activity: 91% of current investors are expanding through brownfield operations—scaling and enlarging existing sites and subsidiaries—rather than establishing new ones. This pattern signals strong confidence among established players in Poland's long-term value proposition but also suggests that Poland has yet to make significant headway on attracting first-time entrants, which will be essential for broadening and deepening its AI investment ecosystem.

The most significant barriers to investment are legal and regulatory uncertainty, compounded by critical infrastructure gaps in connectivity and energy. 66% of surveyed firms identify improving legal certainty, judicial independence, and investor protection as the top priority—framing the institutional environment as the binding constraint that can outweigh all other advantages. On the infrastructure side, Poland lags EU peers in 5G deployment, flagged as an urgent gap by 53% of respondents, while unreliable and costly access to clean energy is a deterrent for 45%—particularly relevant for data center and AI compute investments.

FIGURE 2.6 Nearly 50% of the top 10 headquarters countries of current investors in Poland are from the United States



Source: World Bank MNE AI survey Poland, 2025

Note: Location is taken from the sampling frame; this is not a survey response from current investors. Share of current investors sample (N=100). Top ten categories. Question: What is the HQ's country?:

Enablement is the weakest segment of Poland's AIVC footprint

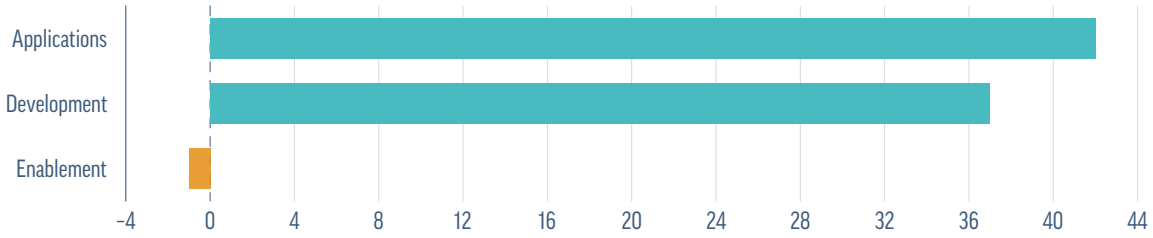
As can be expected, enablement is the weakest segment of Poland's AIVC footprint given that capital requirements and technical complexity far exceed Poland's current industrial capacity.

Two main constraints cap Poland's enablement ambitions. First, Poland's energy mix remains 50% coal-fired, in direct tension with the sustainability commitments of hyperscalers; the most energy-intensive AI activities, including large model training, require firm, low-carbon, uninterrupted power that Poland cannot yet reliably provide (Insights #11). Second, Poland faces a demand-side constraint rooted in the limited technological sophistication of its firm base. Much of the economy remains anchored in cost-competitive activities with little incentive or capacity to adopt advanced AI. Without a critical mass of domestically embedded firms generating genuine demand for AI capabilities, there is a risk that Poland's infrastructure investments attract foreign compute users rather than catalyzing a homegrown AI economy (Insights #12)

Poland already functions as an operational hub for global MNEs, and the scale of that presence makes the risk concrete. Poland attracted over $6 billion in AI-related infrastructure commitments in 2025, including hyperscaler cloud, semiconductor, and data-center investments (Introl 2025; Microsoft 2025). Microsoft announced $700 million to expand its hyperscale cloud and AI infrastructure by 2026; Google signed a memorandum with the Polish Development Fund on AI deployment in energy and cybersecurity; and the EU selected Poland to host two AI Factories: the Piast AI Factory at the Poznań Supercomputing and Networking Center and the Gaia AI Factory at AGH University in Kraków, making Poland one of the few EU countries to host two such facilities (Insights #12). Building on this foundation, Poland has proposed hosting an AI Gigafactory under the EU InvestAI initiative.

FIGURE 2.7 **With the exception of the enablement segment, the perception of Poland's competitiveness within the AIVC has improved (change over the last 3 years)**

Net competitiveness improvement by segment, share of responses indicating improvement minus share of responses indicating deterioration (%)



Source: World Bank MNE AI survey Poland, 2025

Note: Perception of Poland's competitiveness over last 3 years (N=158 MNEs aware of or considering Poland)

The infrastructure and data agenda

Energy and 5G infrastructure: Telecommunications (56%), clean energy (43%), and energy reliability (42%) are the top infrastructure gaps identified by nearshoring investors (MNE survey). Resolving the connectivity gap will be necessary to expand the range of AI activities Poland can credibly host.

Electricity supply is a real challenge for the broader energy transition. Poland's grid, designed for centralized fossil-fuel generation, faces significant pressure as renewables expand and electrification accelerates across transport and heating; a challenge the World Bank's Poland CCDR, 2024 prices at roughly 4% of GDP cumulatively over the next decade, with PSE and the government already committing €24 billion through 2030 and an additional €19 billion through 2035. Nuclear capacity (expected no earlier than the mid-2030s) will provide baseload stability in a grid increasingly dominated by offshore wind and solar but offers no near-term relief. For AI specifically, however, electricity infrastructure is not currently viewed as a binding constraint. The transmission authority projects data center installed capacity rising from about 200 MW today to 1 GW by 2030, 3 GW by 2036, and 5 GW by 2040. Under these scenarios, grid development—already calibrated to the National Energy and Climate Plan (NECP) electrification pathways—is broadly sufficient to absorb AI demand without major additional system costs. Hyperscale facilities are expected to connect directly to transmission, bypassing distribution-level bottlenecks; data centers may improve system management as stable baseload demand with flexibility to absorb renewable generation and reduce curtailment. In fact, it's telecom infrastructure that is considered as the primary determinant of data-center location decisions in Poland, with land availability near Warsaw.

Telecom infrastructure is a concrete near-term constraint. Poland's Very High Capacity Network (VHCN) coverage stands at 81.1% of households, above the EU average of 78.8% (EC Digital Decade Report 2024), and the country is on track for full fiber coverage by 2030. However, 5G deployment remains a gap: Poland trails EU peers due to delayed allocation of pioneer frequency bands and has yet to deploy a full standalone 5G core network, constraining industrial AI and edge-cloud applications (European Commission 2025). Looking ahead, Poland is among the countries pursuing next-generation high-performance computing capacity under the EU AI Continent Action Plan, which could materially strengthen its enabling infrastructure position.

Poland's data landscape also poses hurdles. On the public side, the country performs strongly: in the EU Open Data Maturity Report 2025, Poland ranked third in Europe overall with a score of 97.8%, consistently performing at the top across the policy, portal, and impact dimensions. Yet significant structural weaknesses remain. Within the public sector itself, data collection standards remain inconsistent across agencies and levels of government, creating silos that constrain the training of AI systems on administrative data. On the private side, industrial and commercial datasets remain fragmented and poorly governed, limiting the data ecosystems that enterprise AI applications depend on. GDPR compliance costs weigh disproportionately on SMEs, and the European Data Protection Board's December 2024 opinion on the use of personal data in AI training has introduced additional legal uncertainty for developers. Taken together, Poland's data strengths are real but narrowly concentrated; and the gap between open government data leadership and the broader data readiness required for economy-wide AI adoption remains substantial.

Poland's OECD AI Enabling Infrastructure score of 0.49 (out of 1.0)—well below the leaders (U.S. 0.72, Switzerland 0.62)—captures this broader composite of compute, connectivity, and digital infrastructure indicators rather than electricity capacity alone (OECD, 2026).

INSIGHTS #12

Poland's AI factories and data centers

Poland is increasingly positioned as a diversification market within Europe's evolving data center geography—attracting spillover demand from more capacity-constrained Western hubs, supported by growing grid availability, expanding renewable energy deployment, and strong integration with European electricity and digital networks.

The Polish data center market was valued at $1.16 billion in 2024 and is projected to reach $2.78 billion by 2030. This trajectory reflects both demand-side pull from a large and growing digital services sector and supply-side push from major hyperscaler commitments. Microsoft announced an investment of PLN 2.8 billion (about $770 million) by June 2026 to expand its hyperscale cloud and AI infrastructure in Poland, building on the Azure Poland Central region launched in Warsaw in 2023—the first hyperscale cloud region in CEE. Google has similarly deepened its commitment, signing a memorandum with the Polish Development Fund focused on AI deployment in energy and cybersecurity. Yet it is worth noting that, in terms of installed capacity, Poland remains a relatively small player by European standards. Poland's commercial data centers totaled about 200 MW in 2025 (EUDCA, 2026)—a fraction of the capacity in Western Europe's leading hubs: United Kingdom (1772 MW), Germany (1737 MW) and the Netherlands (951 MW). This gap underscores both Poland's relative immaturity as a data center market and the scale of the opportunity ahead.

New private commitments sit within a broader public investment framework. The Polish government has committed nearly $3 billion to AI enablers, including data processing capacity via the EU Recovery and Resilience Fund and semiconductor production capacity under the National Framework for Supporting Strategic Semiconductor Investments (OECD, 2025). At the European level, Poland's two AI Factories are part of a wider network backed by combined EU and national investment.

Poland has real comparative advantages but also limitations as an infrastructure host. Operational costs are estimated at 40–60% below Western European alternatives, and Poland's geographic position enables low-latency access to both Western European and emerging Eastern markets. However, four considerations temper the optimism. First, the infrastructure is predominantly owned and operated by foreign firms, meaning Poland captures employment, tax revenue, and connectivity benefits but not necessarily the deeper economic value that comes with ownership and control. Second, the current carbon intensity of the grid, the cost of electricity, and the absence of firm baseload power hinder Poland's attractiveness as a location for AI compute (Insights #11). Third, Poland has yet to develop a sufficiently large base of sophisticated domestic users—firms capable of deploying advanced AI at scale—which limits the broader economic spillovers that infrastructure investment could otherwise catalyze. Fourth, translating physical infrastructure into a thriving AI ecosystem requires not just compute capacity, but talent, research excellence, and strong linkages between industry and academia, all of which remain works in progress.

Converting hosting into capability-building requires deliberate policy to ensure that infrastructure investment generates domestic research activity, skills development, and supply chain linkages rather than simply adding to Poland's real estate and energy markets.

Poland's position in the Development layer is one of talent supply rather than IP creation

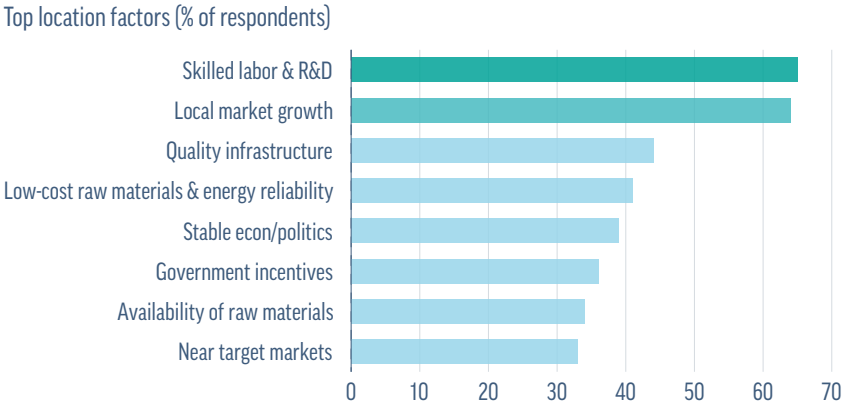
Poland has the largest IT talent pool in CEE, with specialists growing from 525,000 in 2023 to 607,000 in 2024. Warsaw ranks in the top 15 global cities for AI talent, and Polish developers consistently rank among the world's top technical performers (Polish Agency for Enterprise Development, 2025; Polish Investment and Trade Agency, 2025; ABSL, 2024). The MNE survey confirms this advantage: skilled labor and R&D capabilities are cited as the primary driver of location choice by current investors.

Yet talent has not translated into domestic intellectual property (IP) creation at meaningful scale. The development layer in Poland is therefore best characterized as a talent export story: Polish engineers contribute to development-layer activity primarily within subsidiaries of MNEs. Surveyed MNEs in the development segment concentrate in data infrastructure and data assets (94% and 79% of the development sample respectively). Development-segment investment is overwhelmingly brownfield: 91% of current investors are deepening existing operations rather than establishing new ones. The PLLuM initiative is the most visible attempt to build domestic foundation model capacity, but it remains early-stage and state-driven rather than commercially self-sustaining. A complementary effort is Bielik—an open-source Polish-language LLM developed by the SpeakLeash Foundation together with partners and a broader community. Bielik is a rare instance of domestically originated AI development, yet it remains community-driven and has yet to demonstrate a path to commercial scale; underscoring the broader challenge of converting Poland's technical talent into globally competitive, homegrown AI products.

Within the institutional landscape, Research Institute IDEAS represents the most structurally deliberate attempt to break this pattern. Designed as a center of excellence bridging academic research and market application, RI IDEAS concentrates fragmented human capital, trains PhD-level talent, and establishes direct technology transfer mechanisms between theory and practice—generating domestically originated IP. Yet its situation mirrors the systemic tensions described throughout this report: it will need to secure stable long-term funding, offer salaries competitive with the private sector, and ensure that innovations developed within its walls are absorbed by local businesses.

Across the development layer—from MNE subsidiaries to community-driven models and nascent research institutions—Poland supplies a critical input to a value chain whose IP and margins sit abroad. Closing that gap does not mean internalizing the full chain; it means building enough domestic demand for AI capabilities that each segment anchors value locally rather than exporting it.

FIGURE 2.8 Skilled labor and R&D capabilities drive decision on locating in Poland for AI investments



Source: World Bank MNE AI survey Poland, 2025.

Note: Multi-response question; shares sum to >100%. Some categories. Share of current investors sample (N=100). Question: What were the most important factors that drove the decision of your firm to initially establish subsidiaries or acquire affiliates in the AI value chain in Poland?

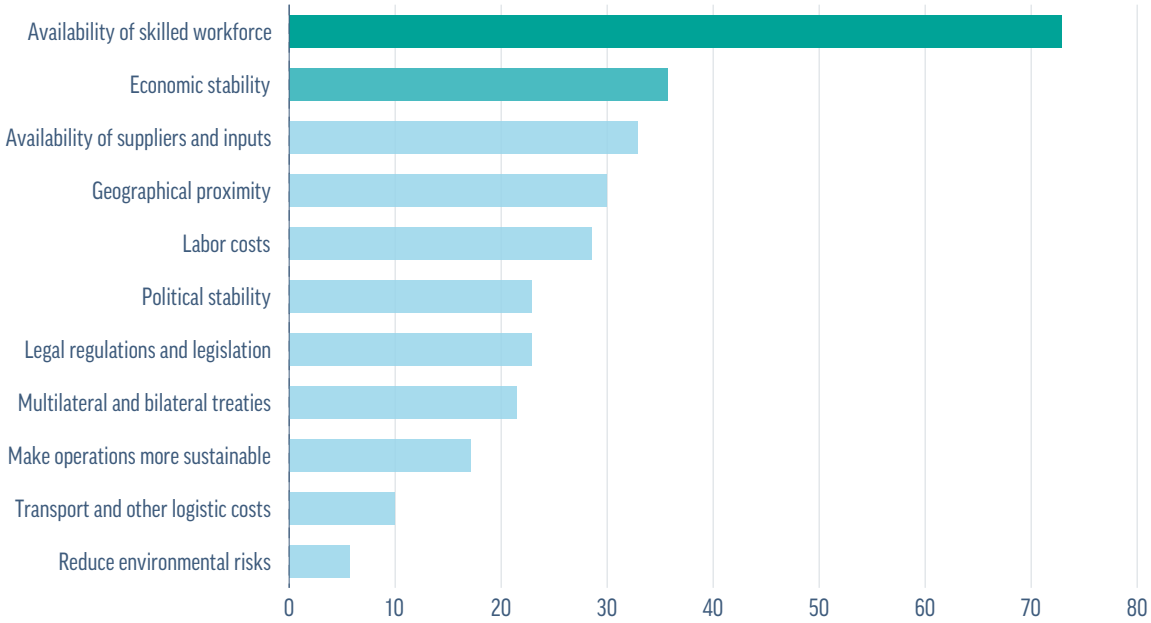
Perceptions of Poland's development-segment competitiveness are nonetheless improving

47% of nearshoring MNEs report improved competitiveness (+37 percentage points).

The skills gap most frequently cited is specialization: AI and Machine Learning (ML) engineering (65%) tops the agenda for nearshoring investors, ahead of data science (46%) and domain-specific expertise. The critical transition Poland faces is from general software engineering to production-ready AI engineering, which requires more specific training and different institutional connections between universities, research institutions, and firms.

FIGURE 2.9 **Availability of skilled labor and economic stability are the top 2 key factors considered for nearshoring**

(% of respondents)



Source: World Bank MNE AI survey Poland, 2025.

Notes: Multi-response question; shares sum to >100%. Share of nearshoring investors sample (N=70). The reported estimates are highly precise, i.e., MoE between ±7.5% and ±12.5%, except for transport and other logistic costs, and 'reduce environmental risks', which are moderately precise, i.e., Margin of Error (MoE) ≤ ±7.5%. Question: What factors have influenced the use of a nearshoring strategy?

Polish AI ventures lead CEE in Application, but structural constraints cap scaling and higher-value AI products

In contrast to Development, the Application layer moves beyond talent supply to growing value creation. A nascent indigenous AI venture ecosystem is forming around Poland's Application stronghold: Polish AI startups raised €171 million in 2024, the highest in the CEE region (The Recursive, 2024), and Polish-founded firms have produced category leaders such as Brainly and ElevenLabs. The technical and entrepreneurial conditions for globally competitive AI ventures are present. Structural constraints, however, prevent this ecosystem from scaling and extending Poland's AIVC position upward.

Founder formation is thin. Among Poles who see business opportunities, 52% say fear of failure would prevent them from starting a business, against 47% in the EU; only 3.1% of non-entrepreneurs plan to start a business within three years, compared with a European average of 15% (PARP, 2026). For skilled graduates, employment in multinational subsidiaries and corporate R&D operations offers a lower-risk, lower-variance income path than founding a startup in a nascent capital environment, weakening the conversion from technical talent to AI-native founders.

The research-to-firm pipeline is equally weak. Poland's gross expenditure on R&D sits at 1.41% of GDP, well below the EU average (World Bank, 2026). Reflecting this gap, 56% of Polish startups cite limited access to finance as their main barrier to development (PARP, 2026). University-industry linkages remain among the weakest in the EU: public-private co-publication intensity reaches only 56.6% of the EU average, universities face limited incentives to commercialize research, and industry funding of higher-education R&D sits below the OECD average (World Bank, 2026). The institutional machinery for converting research and technical talent into investable AI ventures is largely absent.

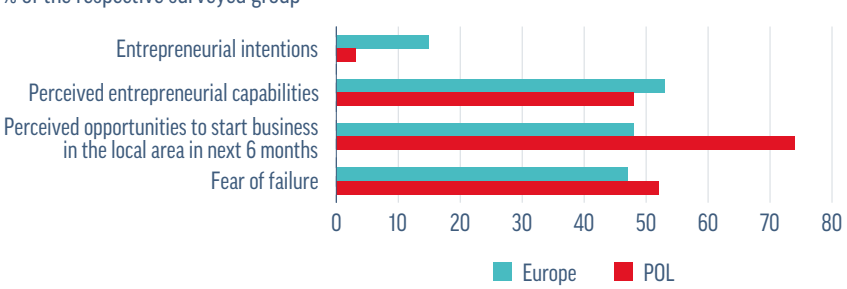
Lack of capital depth compounds these structural deficits: VC investment sits at 0.05% of GDP against an EU average of 0.2% (PFR Ventures & Inovo, 2025), pushing the most promising Polish AI ventures to raise abroad to scale. But the binding constraint is at the earlier investment stage—even with deeper capital, Poland would lack the founder and research pipeline to absorb it. Together these constraints cap upward AIVC mobility: without deliberate effort to connect entrepreneurship policy with the opportunities created by the AI transition, Poland risks remaining primarily a consumer of AI technologies developed elsewhere, rather than a competitive producer of them.

See **Appendix Book** for details on Poland's risk capital and startup ecosystem.

49 STARTUPS
per 1 million people in Poland, compared with average 82 in EU

56% OF STARTUPS
citing limited access to finance as the main barrier to development

FIGURE 2.10 Entrepreneurial attitudes in Poland versus the average for Europe



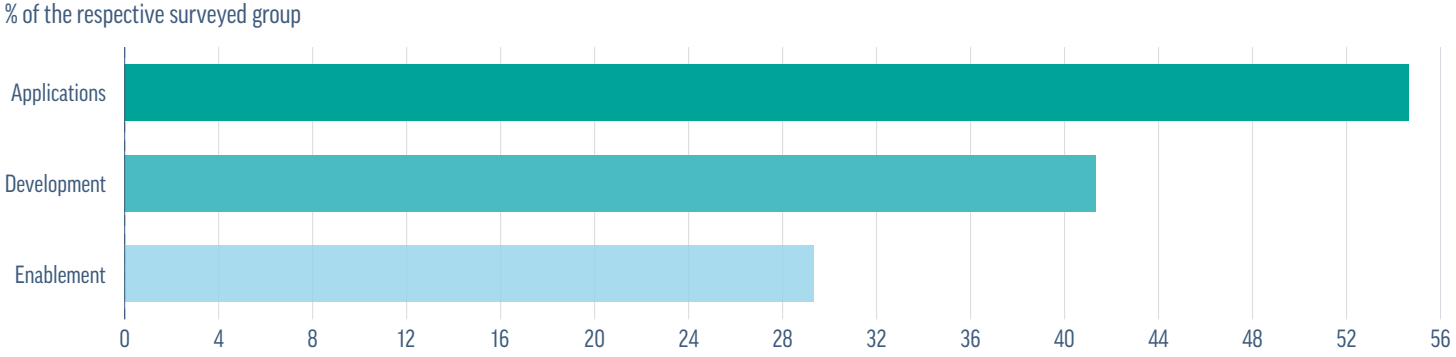
Source: PARP 2026, Report on entrepreneurship

MNE Application investment in Poland is B2B-heavy and anchored by the Business Services Sector (BSS)

While indigenous venture formation is structurally constrained, MNE-led application investment is intensifying: 63% of surveyed MNEs are engaged in application activities, and the application segment shows the strongest nearshoring momentum (+42 net pp, with 52% of nearshoring MNEs reporting improved competitiveness). Poland's central location, EU membership, and talent pool are the primary draws. Surveyed application MNEs concentrate in B2B enterprise solutions—92% serve business use cases—with operations and supply chain optimization (75%), document intelligence and automation (65%), and customer service and support (61%) as the leading activity areas.

The BSS (Insights #13) is the most tangible expression of this position. As of early 2026, Poland has 2,179 business services centers employing 500,500 professionals, accounting for 6.1% of GDP and 7.8% of enterprise employment. The value of exports of knowledge-intensive services provided by centers located in Poland reached $42.3 billion in 2025, up from $48.4 billion in 2024 (ABSL, 2026; ABSL, 2025). Within the sector, AI adoption is significantly ahead of the broader economy: 76.5% of business services centers use Intelligent Process Automation (IPA/RPA), up from 74.1% in 2025, while 84.4% use genAI solutions and 35.2% already report early adoption of agentic AI.

FIGURE 2.11 Application and development are the AIVC segments where MNEs are more likely to invest over the next 3–5 years in Poland



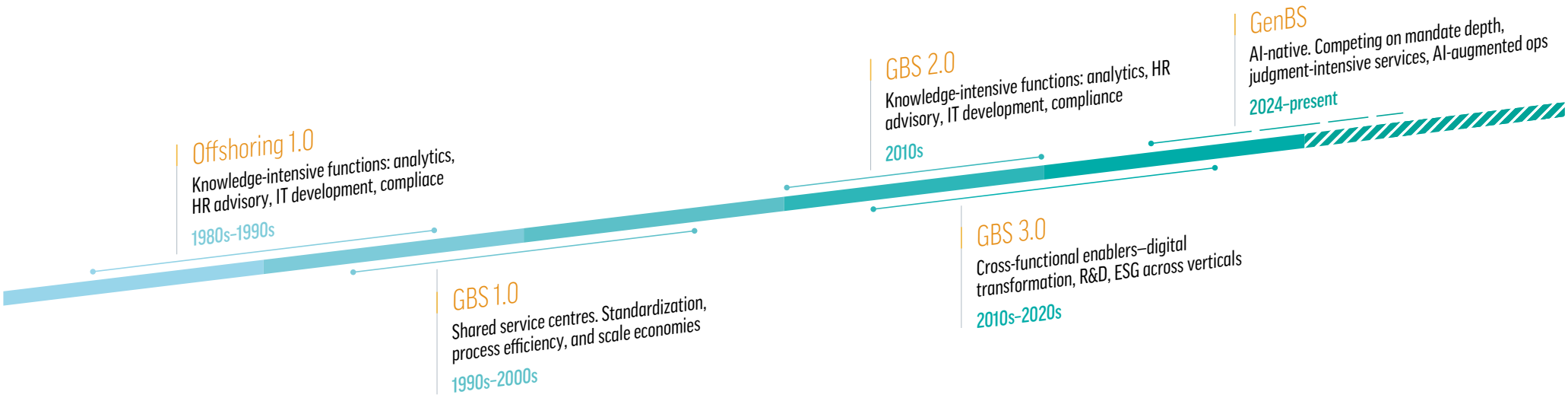
Source: World Bank MNE AI survey Poland, 2025.

Note: Multi-response question; shares sum to >100%. Share of potential investors sample (N=75). The reported estimates are moderately precise, i.e., MoE between ±7.5% and ±12.5%. Question: Which of the following AI value chain segment are you most likely to invest in for the next 3–5 years in Poland?

AI is reshaping the Business Services Sector

AI is shifting BSS firms away from high-volume, transaction- heavy delivery toward mandate-driven, knowledge-intensive roles.

Competition is moving from cost and scale to capabilities such as advanced analytics, AI-enabled operations, digital transformation, cybersecurity, end-to-end proces orchestration, and internal advisory services. Emerging Global Business Services (GBS) 3.0 and Generative Business Services (GenBS) models position the sector as a strategic, cross-sector platform for value creation rather than a back-office function. In this model value creation increasingly depends on process ownership, intelligence, integration capabilities, and the ability to redesign operating models around AI rather than simply automate existing workflows.



INSIGHTS #13

Poland's Business Services Sector

Over the past two decades, Poland has emerged as one of Europe's leading locations for business services—including shared services centers (SSCs), global business services (GBS), IT services, and other knowledge-intensive business services. Leveraging relatively low labor costs, a well-educated and multilingual workforce, and proximity to Western Europe, the country initially attracted FDI in transactional and cost-focused functions such as back-office processing, often through captive centers established by MNEs. This positioned Poland as a leading nearshoring location within Europe.

The sector expanded rapidly in terms of both scale and economic significance. By the end of Q1 2026, Poland hosted nearly 2,200 business services centers operated by more than 1,200 companies, employing 500,500 professionals. The sector accounts for 7.8% of enterprise employment (2025), contributes an estimated 6.1% of Poland's GDP and plays a growing role in Poland's exports of services and integration into global value chains (ABSL, 2026). Although employment continues to grow, increased heterogeneity in firm performance and localized restructuring is being observed, particularly in major hubs, reflecting a sector facing rising costs, tighter labor markets, global restructuring processes, and thus greater competitive pressures.

The sector's development has also been shaped by firm structure and geography. MNEs continue to dominate, through a mix of captive centers and third-party service providers, while domestic firms play a more limited role. Geographically, activity is concentrated in a small number of large metropolitan hubs—most notably Kraków, Warsaw, Wrocław, the Tricity area, and the Katowice conurbation—each with distinct specialization profiles and labor market conditions. This spatial and organizational configuration has supported rapid scaling but also contributes to emerging differences in performance and adjustment pressures across locations.

At the same time, the functional profile of the sector has shifted markedly. What began as a platform for standardized, transactional services has evolved toward more complex and higher value-added activities, with service centers increasingly delivering end-to-end business processes, advanced IT and digital services, data analytics, and specialized finance and advisory functions (ABSL, 2026). This functional upgrading has positioned Poland as a mature business services hub in Europe, comparable in scale and scope to long-established locations such as Ireland, while remaining deeply embedded in global delivery networks.

See **Appendix Book** to read about functional reconfiguration of the Business Services Sector under AI.

Poland's BSS is transforming but facing risks

Poland's BSS is well-placed to navigate the AI transition. The sector has progressively accumulated the human capital and organizational infrastructure that higher-value mandates require. By 2025, the export generated by service centers reached $48.4 billion and the export value per employee exceeded $96,000—substantially higher than a decade earlier (ABSL, 2026). MNEs are responding to this capability deepening by expanding analytical mandates for Polish-based teams and establishing centers of excellence, reinforcing the sector's upward trajectory within global value chains. Labor market signals point in the same direction: jobs in AI-exposed occupations are expanding, skills requirements are evolving faster, and wages are rising about twice as quickly in industries more exposed to AI (PwC, 2025).

Yet the evidence also points to a sector in a transitional phase where risks are concentrated at the labor market level rather than the sector level. Adoption is widespread but shallow: around three quarters of firms report using some form of AI or automation, but only about one fifths of work processes are currently automated, and most firms describe productivity gains as modest rather than transformational (ABSL, 2026). The gap between strategic ambition and operational reality is wide: firms plan to scale AI use significantly, but nearly half have trained only a small share of their workforce in AI-related skills (ABSL, 2026). Automation is compressing demand for routine cognitive work while raising the value of problem-solving, contextual judgment, and process design. Entry-level roles have not disappeared, but they now require higher baseline competencies, narrowing the traditional pathway through which workers entered and progressed in the sector. At the same time, junior analysts, process specialists, and coordinators remain heavily concentrated in the routine cognitive tasks most exposed to automation, eroding the middle rungs of career ladders that have historically underpinned upward mobility in Polish business services.

A further structural consideration is that Poland's AI task exposure may be lower than headline occupational data suggest. Even within the same roles, Polish workers tend to perform fewer of the digital, analytical, and -processing tasks most directly affected by AI than their counterparts in the U.S. or Western Europe (see Section 2.2). This lower exposure does not insulate the sector from AI-driven adjustment—Section 1.2 shows measurable displacement in cognitive-labor categories through the early 2030s—but it does mean that Polish BSS workers are further from the productivity frontier that AI complementarity opens up. Closing that distance depends heavily on workforce upskilling and organizational change within firms.

2.2 Are Polish workers ready for AI?

Polish workers sit further from AI's productivity channels than peers in high-income countries—a reflection of underdigitized workplaces, not of insulation from AI's labor-market effects. Occupational exposure—the share of a job's tasks AI can perform—is a neutral technical measure that resolves into either displacement or augmentation depending on workers' skills, firms' adoption, and institutional support. At 48% of workers in the top quartile of the global AI exposure distribution, Poland trails the EU average of 53% and the U.S. by a wider margin. Exposure has risen over the past decade, but the productivity channel through which AI delivers gains remains narrower in Poland than in frontier economies. Raising exposure mechanically is not the policy objective; the objective is to position workers, firms, and institutions to convert exposure into productivity gains. The concern is that Poland is converging slowly on both fronts: the digital intensity of Polish jobs trails frontier economies, and so does the complementary readiness that would turn exposure into augmentation rather than displacement.

Three questions frame our assessment of Polish workers' AI readiness:

1. How exposed are Polish workers to AI and what drives the gap?
2. Are Polish workers equipped with the skills needed to adapt?
3. How does AI interact with Poland's labor market supply and demand dynamics?

Overview: The gap with frontier economies is primarily a workplace digitization problem: ICT intensity accounts for nearly half the difference with the U.S. and Western Europe, not skill composition. But readiness on the skills side is equally concerning. Poland ranks first in Europe for perceived training needs, and foundational skills have deteriorated over time. The deficit is uneven: digital competency gaps are sharpest among older workers, whose share of the labor force will grow as demographic aging accelerates, while younger generations are less equipped in foundational skills. These dynamics have direct macro implications. **The policy-consistent scenario (E3) assumes labor markets have the institutions in place to support workers' transitions** (high labor mobility); under low-mobility conditions, the 2035 employment loss widens sharply. Mobility is not a technical parameter but a policy outcome. The exposure and readiness gaps above determine which regime Poland will operate in.

WORKERS

48%
of Polish workers are highly exposed to AI (compared to 53% at EU level)

HALF
of the difference between Poland and the U.S./Western Europe can be attributed to ICT intensity at work

15TH
out of 18 countries on "problem-solving in technology-rich environments" PIAAC

1ST
in Europe for perceived training needs

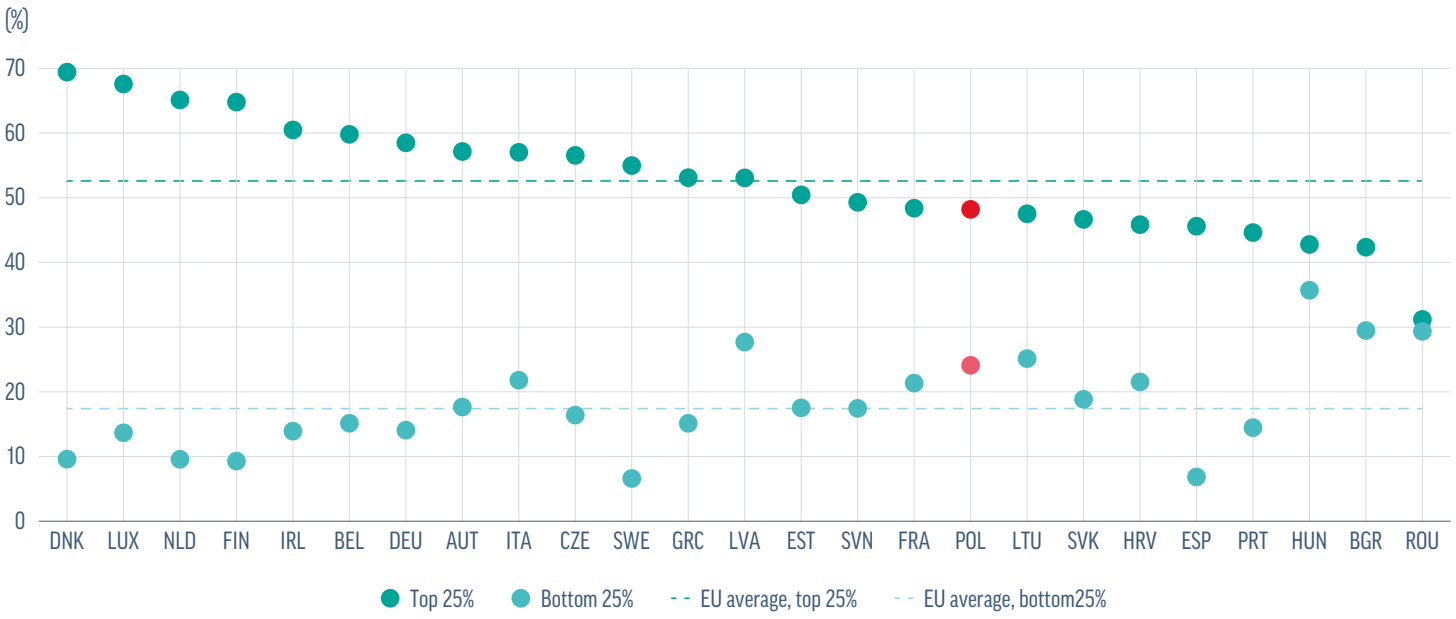
Polish workers' AI exposure is rising, but more slowly than in the U.S. and EU – keeping Poland farther from AI's productivity gains

Polish workers' AI exposure increased over the past decade, driven by workplace digitization and global task diffusion. Worker-level regressions reveal several key determinants of AI exposure (Insights #14) across countries. Access to digital technologies and human capital, particularly education and literacy proficiency, is positively associated with AI exposure, with this relationship holding even within narrowly defined occupations.

Overall, Polish workers' AI exposure increased between 2012 and 2022. As more workers gained regular access to computers at work, the task content of their jobs shifted toward activities more susceptible to AI. Simultaneously, a global trend of rising AI-exposed task content across all occupations provided an additional upward impulse affecting Poland alongside other economies.

Still, Polish workers' exposure trails U.S. and EU peers. At 48% of workers in the top quartile of the global AI occupational exposure distribution, Poland trails the EU average of 53%; and the gap with the United States is wider still. Exposure is the channel through which productivity gains accrue. Workers in low-exposure occupations are not insulated from AI's labor-market effects but distant from its complementarity benefits. Poland's gap with EU and U.S. peers is therefore not a buffer; it is a measure of how much of AI's productivity dividend is currently flowing past Polish workers.

FIGURE 2.12 48% of Polish workers are in highly AI-exposed occupations—below the EU average of 53%, and further still from the U.S.



Source: ILOSTAT and AIOE scores from Lewandowski et al 2025.

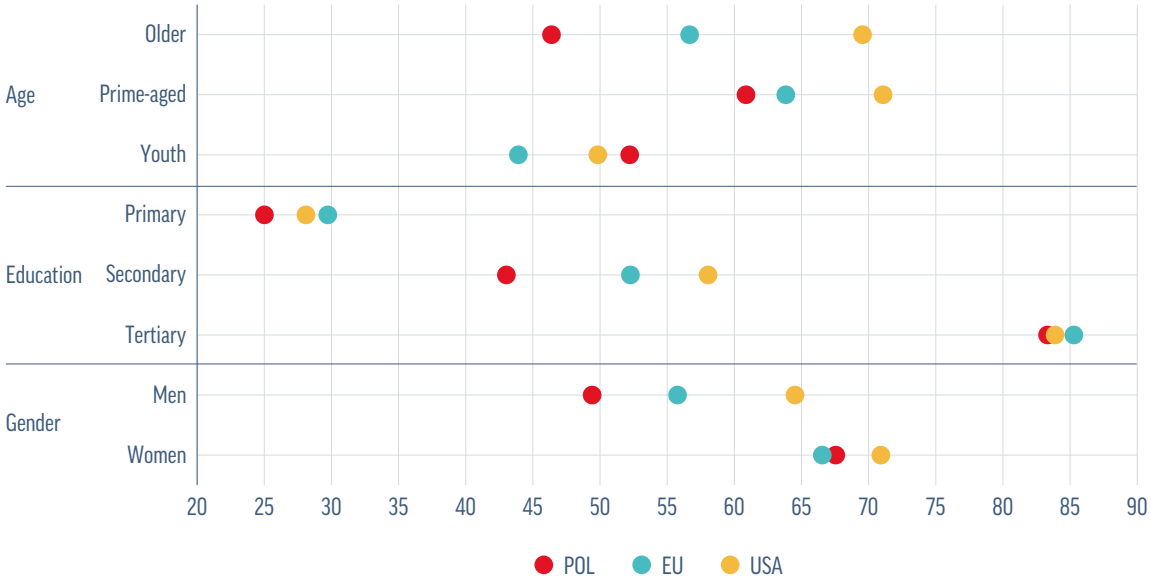
AI exposure in Poland is concentrated among the most educated and, notably, among female workers

Tertiary-educated workers perform more of the analytical, cognitive, and communicative tasks that AI targets, making their occupational profile more susceptible to both displacement and augmentation.

The high exposure share among women reflects their concentration in professional services, administrative, and clerical roles—precisely the occupations where AI is advancing fastest. For both groups, exposure remains below EU and U.S. benchmarks, meaning the augmentation dividend will flow less freely than in frontier economies.

FIGURE 2.13 **AI exposure in Poland is concentrated**

Share of workers in occupations in the top 25% of the global AI exposure distribution (%)



Source: ILOSTAT 2023 and AIOE scores from Lewandowski et al 2025.

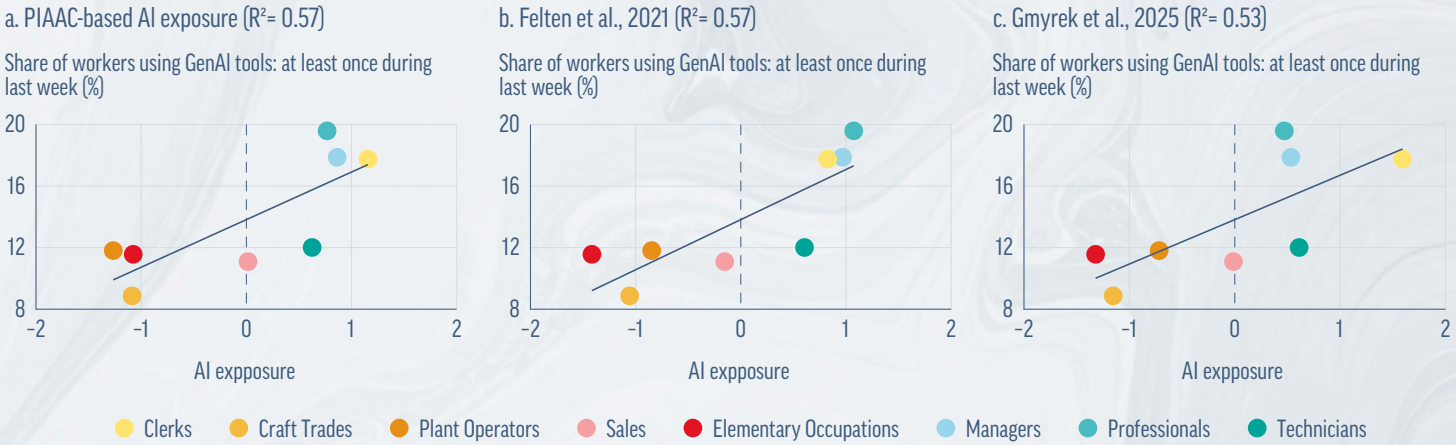
Notes: Global distribution of most exposed occupations , weighted with employment shares. Age groups: 15–24, 25–54, 55+

Measuring exposure to AI: different methodologies

AI exposure indices attempt to quantify the degree to which a worker's tasks—and by extension their job—could be performed or augmented by current or near-term AI systems. Despite a shared objective, existing indices differ substantially in their conceptual foundations, data sources, and units of analysis. **The foundational distinction is between ability-based and task-based approaches.** Ability-based measures, pioneered by Felten et al., 2021, map AI capabilities onto the occupational abilities recorded in databases like O*NET. Exposure is inferred from the overlap between what AI systems can do and what occupations require workers to be able to do. This approach is intuitive and reproducible, but it is calibrated to the U.S. occupational structure and assumes that the same occupation involves the same bundle of abilities everywhere. Task-based measures address this limitation by anchoring exposure to what workers actually do rather than what their occupation is formally classified as requiring. The ILO approach (Gmyrek et al., 2025) draws on purpose-built individual-level survey data to construct occupation-level exposure scores from reported task content, allowing for cross-country variation in how the same occupation is performed in practice. The IBS approach (Lewandowski et al., 2025) uses the OECD Programme for the International Assessment of Adult Competencies (PIAAC) worker-level data to construct exposure estimates at the individual level, capturing within-occupation heterogeneity in task content driven by skill composition, workplace digitization, and sectoral context. A worker-level index of AI exposure is constructed for 16 countries.

The analysis of this section of the report relies on the AI occupational exposure measure developed by Lewandowski et al., 2025. The strong and positive correlation between the share of workers who reported using genAI tools at work at least once during the reference week and these three occupational AI exposure indices [Lewandowski et al., 2025, Gmyrek et al., 2025 and Felten et al., 2021] validates the different indices and their capacity to identify occupations in which workers are most actively adopting genAI tools in practice.

FIGURE I14.1 Positive correlation of all three indices



Source: AI exposure indices from Lewandowski et al., 2025, Gmyrek et al., 2025 and Felten et al., 2021. The share of workers using genAI tools comes from Gmyrek et al., 2025.

Poland's AI exposure gap reflects structural underdigitization, not insulation—a barrier for capturing AI's productivity dividend

Three structural mechanisms explain the gap. ***First, within-occupation task variation:*** the same job title involves different activities across countries, and Polish workers in nominally high-exposure occupations perform fewer of the specific tasks that AI targets than their counterparts elsewhere. ***Second, skill composition:*** within any given occupation, lower-skilled workers engage less frequently with the digital and analytical tasks most relevant to AI; compressing effective exposure even in sectors that look highly exposed on paper. ***Third, the pace of technological adoption:*** in less digitized economies, even occupations classified as AI-exposed may not yet have adopted the workflows that AI would most directly affect, leaving productivity gains unrealized.

ICT intensity at work accounts for nearly half the difference with the U.S. and Western Europe. Using regression analysis (see Appendix Book for details), a decomposition of Poland's gap in AI exposure against the U.S. and Western Europe identifies ICT intensity—the share of workers regularly using computers at work—as the single most important factor, accounting for around 47% of the difference on average and rising to 56% in the Poland-U.S. comparison in 2022. Occupational structure contributes a further 25%, while firm-level characteristics—Global Value Chain (GVC) participation and the prevalence of digitally advanced companies—account for roughly 17%.

These structural mechanisms are not incidental—they reflect Poland's established position within the global economy. As a recipient of significant FDI, Poland has integrated into MNEs' global value chains primarily through manufacturing, shared services, and business process outsourcing rather than through headquarter functions, or strategic decision making (World Bank, 2026). For MNEs, higher-order tasks—those most exposed to AI—tend to be concentrated in parent companies, while Polish subsidiaries perform more routinized, execution-oriented work. This global division of labor is precisely what the within-occupation task variation and skill composition effects capture: Polish workers in nominally similar roles are, in practice, engaged in a narrower and less cognitively intensive slice of those occupations.

FIGURE 2.14 About half of the difference in AI exposure between Poland and comparator countries (U.S., Western Europe) can be attributed to the lower intensity of computer use at work

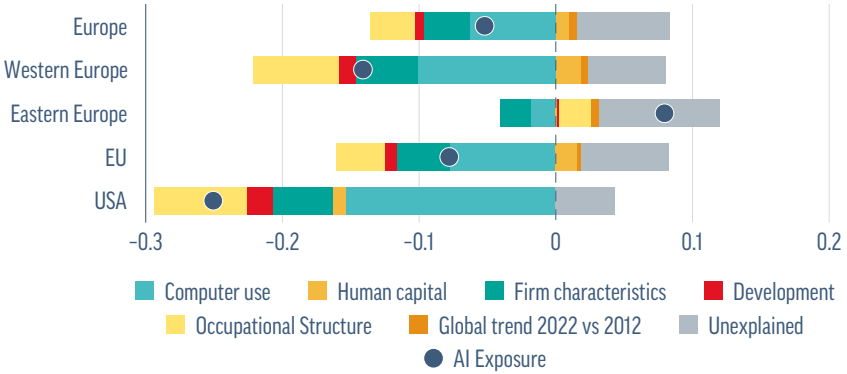
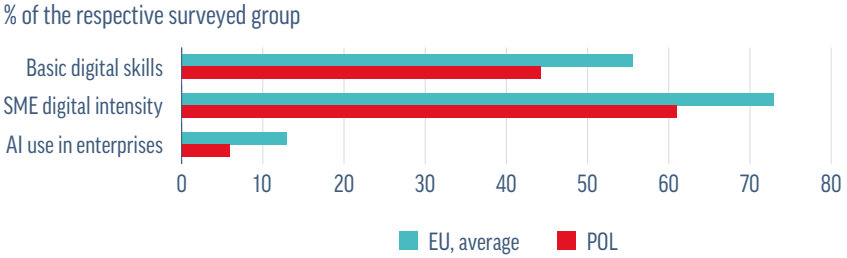


FIGURE 2.15 Poland lags the EU average on most key digital intensity indicators (DESI)



Source: European Commission, State of the Digital Decade 2025 / Eurostat. Notes: Basic digital skills data from 2023 survey; SME digital intensity and AI enterprise use from 2024 survey. All figures reported in State of the Digital Decade 2025.

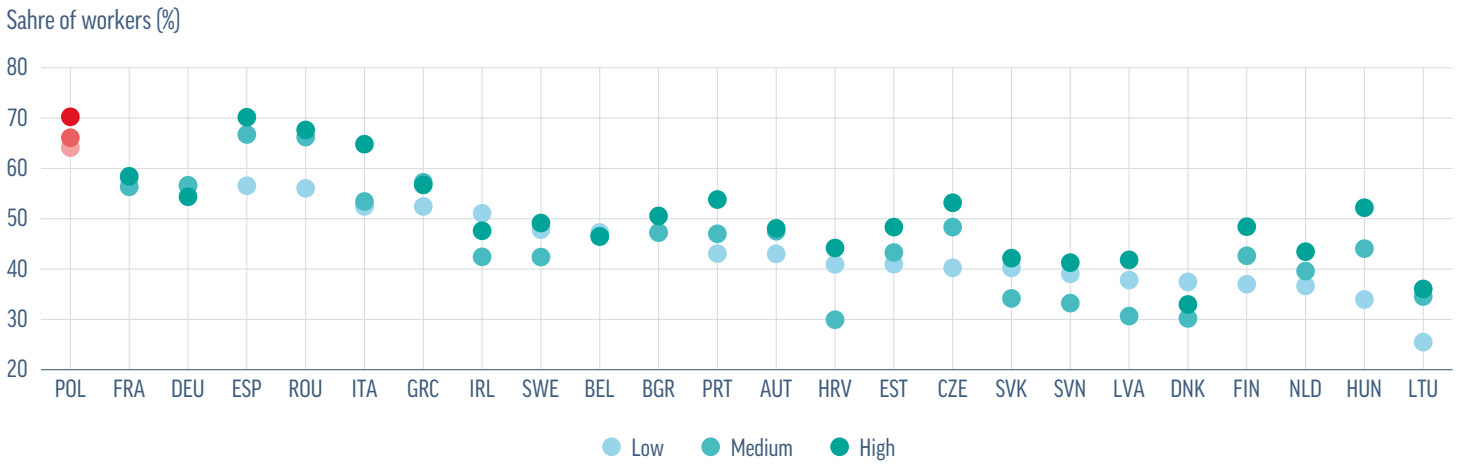
Poland ranks first in Europe for perceived training needs, with digital skills gaps most acute among high-exposure workers

Poland has the highest share of workers in Europe reporting unmet training needs, with digital skills gaps most acute among high-exposure workers. Polish workers most exposed to AI report the highest training needs in Europe. Among high-exposure workers, 71% report needing to develop IT skills—third highest in the sample and 12 pp above the cross-country average—with a 19 pp gap between high- and low-exposure workers within Poland (CEDEFOP, 2023). The perceived gap is widest precisely where AI exposure is most concentrated, suggesting that Polish workers themselves recognize the readiness deficit the technology transition will exacerbate.

Cognitive foundations of the incoming workforce are deteriorating. PISA 2022 results show Polish 15-year-olds posting one of the largest performance declines in the OECD: mathematics scores fell by over 25 points relative to 2018 with reading and science also down (OECD, 2023). Although Poland still performs above the OECD average across all three domains, 23% of students score below Level 2 in mathematics and 22% in reading, meaning roughly one in four Polish 15-year-olds lacks the foundational reasoning skills needed for complex cognitive work. Since today's PISA cohort enters the labor market over the period covered by this report's projections, the trajectory matters: current trends point toward weakening cognitive readiness rather than strengthening it.

The vulnerability is not evenly distributed. Within occupations, lower-skilled workers engage less frequently with the digital and analytical tasks most relevant to AI—meaning effective exposure is compressed even among those nominally in high-exposure roles. Combined with the widening cognitive readiness gap among incoming cohorts, this points to a compounding vulnerability: the workers most likely to be reshaped by AI today face the largest perceived skill gaps, while the workforce of tomorrow is entering with weakening foundations.

FIGURE 2.16 Poland ranks first in Europe for perceived training needs



Source: Own elaboration based on CEDEFOP 2023 data & Ad hoc module on skills. AIOE scores are from Lewandowski et al 2025.

Note: High, medium, and low AI exposure correspond to the top 25%, middle 50%, and bottom 25% of the global AI exposure distribution, respectively.

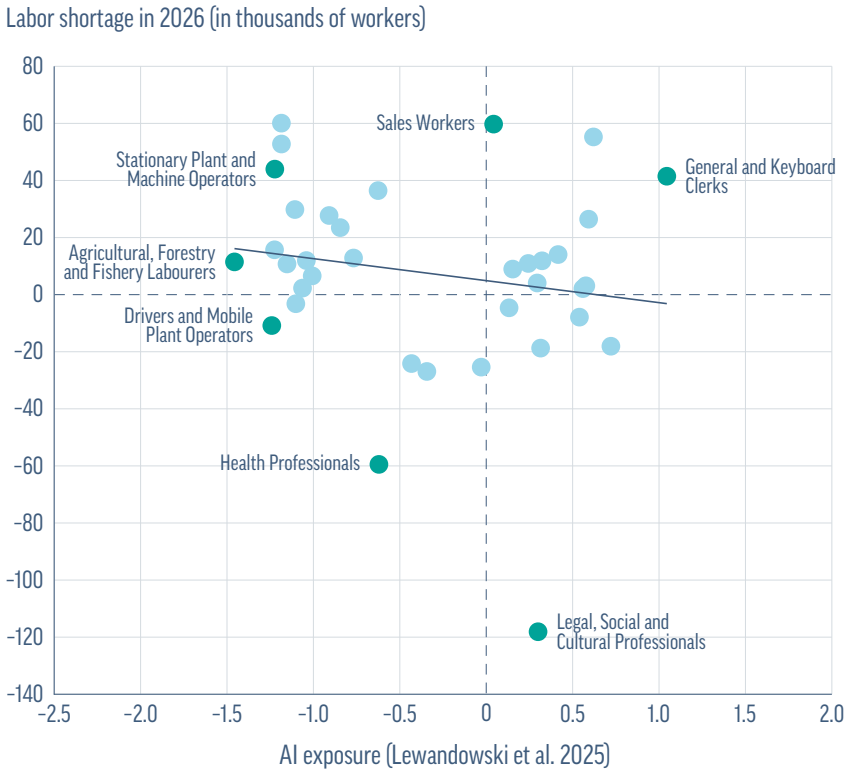
AI exposure does not systematically predict where labor shortages will be most acute but it could help ease specific bottlenecks

Poland faces tightening labor supply driven by rapid demographic decline and strong labor demand. According to Eurostat projections, Poland could lose several million people by 2050, making it one of the fastest-aging economies in the EU. This demographic shift is expected to reduce labor supply, increase dependency ratios, and place growing pressure on public finances, particularly pensions and health care.

Labor shortages are concentrated in several sectors, including high-skill sectors. Health care, construction, transport, and technical professions are among the most affected. In health care alone, Poland faces shortages of up to 25,000 specialist doctors, while shortages also affect nurses and midwives (OECD, 2025). Combined with demographic aging and low unemployment, these constraints suggest Poland is transitioning to a labor-scarce economy, where growth will increasingly depend on productivity, skills upgrading, and technology adoption. AI adoption offers one potential response (Insights #15).

AI exposure does not predict where labor shortages will be most acute but offers selective relief in high-demand occupations. At the occupation level, AI exposure is not significantly correlated with Poland's projected labor supply-demand balance for 2026: there is no general pattern whereby highly exposed occupations face systematically larger surpluses or shortages. The aggregate picture conceals meaningful heterogeneity, however. Several high-exposure occupations also face projected labor shortages—most notably legal, social and cultural professionals. In these cases, AI tools are more likely to complement than displace workers, raising individual productivity and augmenting the output of a constrained workforce. This points to a selective opportunity: targeted AI adoption in shortage occupations could help mitigate supply gaps rather than deepen labor market disruption. The macro results sharpen this point: high-exposure shortage occupations in public, social, and cultural services land in expertise-leveling territory (wages rise, AI complements).

FIGURE 2.17 AI could mitigate labor shortages among legal, social and cultural professionals



Source: Poland System for Forecasting the Polish Labor Market, Ministry of Family, Labor and Social Policy and Lewandowski et al 2025 for AIOE scores.

AI and demographic change

Demographic change and AI adoption interact through feedback loops that shape both the pace of technological adoption and labor market outcomes. While automation and AI can offset labor shortages in aging societies, AI adoption also reshapes labor demand, skills, and participation—affecting demographic dynamics such as labor supply, migration, and workforce aging.

On the supply side, demographic pressures appear to accelerate automation. Acemoglu and Restrepo, 2022 find that a 10 pp increase in aging is associated with 1.6 additional industrial robots per 1,000 workers, suggesting demographics materially shape technology diffusion. For Poland, where both aging and labor market tightening are well underway, these dynamics imply that AI adoption pressures are structural rather than cyclical.

On the demand side, the picture is one of broad exposure but uneven impact. The distributional effects of AI depend on labor market institutions and firm dynamics. Recent evidence suggests that genAI may produce smaller inequality effects than earlier waves of automation, particularly in advanced economies, as job transformation may dominate displacement (Autor, 2024). Worker-level evidence across countries also shows that AI exposure is highest in occupations requiring higher education and offering higher wages, reinforcing skill-biased adoption patterns (Gmyrek et al 2025; Demombynes, Langbein, and Weber, 2025).

AI may also help alleviate demographic constraints directly. For example, AI-assisted medical screening can mitigate workforce shortages in aging societies. Large-scale deployment of AI-supported mammography in Germany detected 6.7 additional cancers per 1,000 screenings without increasing radiologist workloads (Eisemann et al., 2025). Similar applications are emerging in health care, long-term care, and public administration, sectors particularly exposed to demographic pressures.

Taken together, demographic change and AI adoption should be viewed as part of a joint structural transition. Policy responses therefore need to combine reskilling, labor market adaptation, and broader diffusion of technology. In aging economies, productivity-enhancing technologies will need to be complemented by policies that support labor force participation, skills upgrading, and adoption across firms and regions, particularly where infrastructure and access gaps risk widening demographic divides (OECD, 2019; UNCTAD, 2021).

2.3 Are institutions in place for AI?

Poland's government has been proactive and strategic regarding AI at the national and EU levels. As an EU Member State, Poland's AI governance is anchored in the European regulatory framework with the EU setting the binding rules. Poland has nonetheless carved out an active role in shaping EU AI policy (during the EU Presidency in the first half of 2025) while simultaneously building the domestic institutions needed to implement it. Taxation instruments are in place, but the changing AI landscape may call for changes and more coherence.

The section on institutions is not meant to be exhaustive. This reflects two considerations: most of Poland's AI regulatory environment is determined at the EU level—with binding obligations flowing primarily from the AI Act and the Digital Single Market framework—and the governance landscape remains in flux, with key implementing provisions still being elaborated and their practical effects on firms and adopters not yet observable.

Three questions guide our assessment:

1. Does Poland have the policy framework and institutional architecture to implement and enforce the EU AI Act?
2. Is the public sector leading or lagging on AI adoption?
3. Is the tax policy in place adequate to attract AI investments?

Overview: Poland has adopted a proactive AI policy posture, but the institutional framework remains incomplete. National legislation to transpose the EU AI Act is under preparation, including a designated single supervisory authority. Both remain pending, while several advisory bodies are actively shaping the national AI agenda with partially overlapping mandates. At the same time, the public sector is only a nascent catalyst of AI and the tax regime for attracting AI investors requires more analysis.

GOVERNMENT

96.0
Policy Capacity Score (top tier globally)

71
EU eGov score for citizen-facing servicesvs 82 EU average

85
EU eGvov score for business services vs 86 EU average

7,700
Firms using IP Box in 2024

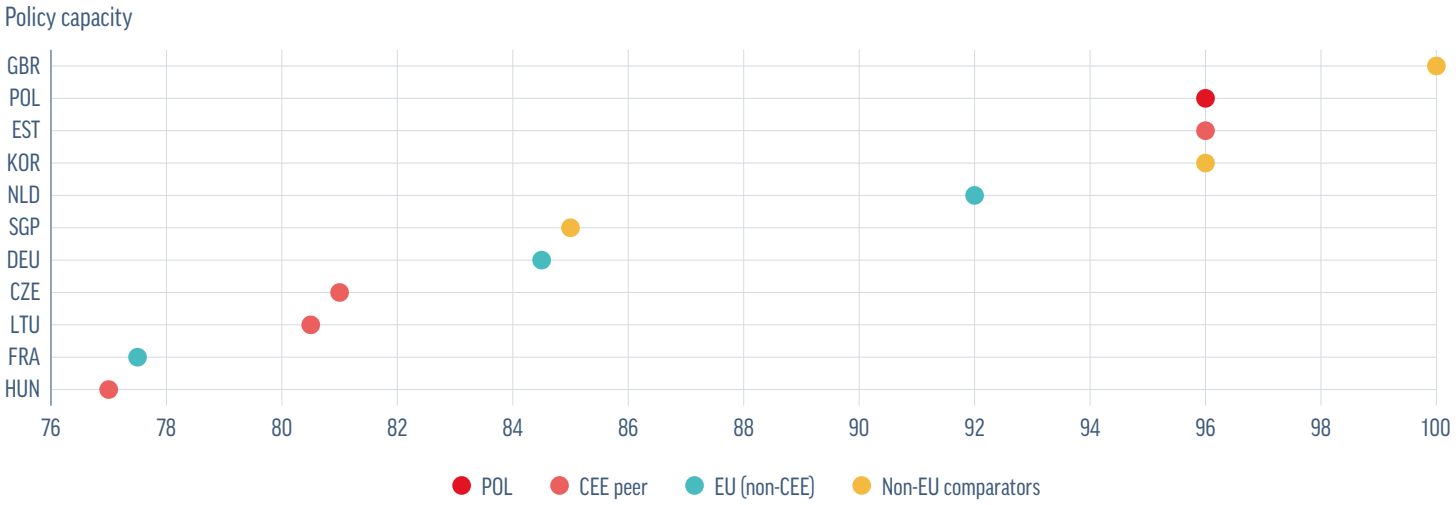
Poland is creating its strategic and policy framework

Poland enters the AI governance era with strategic positioning. Its "Policy for AI Development until 2030" updated in 2025 provides one of the more comprehensive long-term AI frameworks among CEE economies (Insights #16). This ambition is reflected quantitatively: Poland's 2025 Government AI Readiness Index (GAIRI) Policy Capacity score of 96.0 places it in the global top tier for government strategic intent (Oxford Insights 2025). During its EU Council Presidency in 2025, Poland prioritized AI governance and cybersecurity, actively shaping the European regulatory agenda rather than simply transposing it.

At the EU level, the AI Act is now the operative framework, and Poland is moving to complement it nationally. The EU AI Act's risk-tiered structure has direct implications for Poland's key sectors: business services, finance, and manufacturing each host applications that fall under high-risk classifications, creating material compliance obligations for both domestic firms and MNEs operating in Poland. Further, although the EU AI Act is now in force, firms continue to navigate a complex regulatory landscape, combining directly applicable EU AI rules with a patchwork of sectoral legislation (e.g., GDPR, cybersecurity, and product safety frameworks), alongside evolving national implementation arrangements.

Poland is looking to complement the EU legislation with a Draft Act on AI Systems that was put to public consultation in October 2024, revised in February 2025, and adopted by Cabinet for presentation to Parliament in March 2026. Under the new Act, Poland is one of only two EU countries (alongside Lithuania) to designate a single entity as its sole market surveillance authority for AI, and the only one building an entirely new institution for that purpose. That institution is the Commission for the Development and Safety of Artificial Intelligence, known by its Polish acronym KRiBSI. Beyond its supervisory structure, the Polish draft legislation introduces two instruments that address challenges shared across the EU: (1) a mechanism for individual opinions; (2) a Social Council for AI, an advisory body of 9 to 15 members drawn from academia, civil society, business chambers, and trade unions, all required to have expertise in areas such as AI, cybersecurity, or human rights.

FIGURE 2.18 Poland scores in the global top tier on Policy capacity for AI



Source: Government AI Readiness Index, Oxford Insights 2025.

But the institutional architecture for AI governance is still incomplete

Despite the forward-looking policy framework, Poland's AI governance remains fragmented and legally incomplete. Overall governance is led by the Ministry of Digital Affairs, which oversees AI policy, strategy, and implementation of the EU AI Act. The ministry also chairs the AI Working Group (GRAI) and will support KRiBSI when enacted. Advisory groups like the AI Policy Task Force, Scientific Council for AI, Labor Market Observatory, International AI Policy Observatory, and Legal Task Force offer support. The announcement in November 2024 of a cross-governmental AI Council and Artificial Intelligence Fund added a further institutional layer, but as of early 2026, neither has been established on a formal legal basis. The AI Council overlaps in scope with both the Ministry of Digital Affairs and the proposed KRiBSI, raising questions about coordination that have not yet been resolved.

The most significant institutional development currently in progress is the establishment of KRiBSI as Poland's national market surveillance authority under the EU AI Act. KRiBSI is designed as a collegial body, drawing in representatives of the financial supervisor (KNF), the competition authority (UOKiK), the broadcasting council, and the telecoms regulator, embedding sectoral expertise within its decision making structure. It will also introduce two regulatory instruments new to Polish administrative law: binding interpretative opinions on AI Act applicability, and a Social Council for AI.

The Future Council *(Rada Przyszłości),* an 18-member advisory group reporting to the Prime Minister's office and led by the Ministry of Finance and Economy, was also launched in February 2026. Made up of tech entrepreneurs, scientists, and industry leaders, the Council focuses on AI, space, biotech, and dual-use technologies, prioritizing technological sovereignty. Unlike regulatory bodies under the Ministry of Digital Affairs, it is geared toward economic competitiveness and reports to different leadership. The Council adds a fourth separate institution handling AI issues in Poland, but there is no clear system for coordinating their efforts.

Poland's AI landscape in early 2026 features strong political focus, active legislation, and ambitious planning, but also an increasing number of uncoordinated advisory groups, a new supervisory authority, pending legal funding instruments, and a draft national strategy. Unresolved tensions between institutional independence, ministerial control, and cross-authority coordination represent the most substantive governance risk in Poland's current AI institutional framework.

Poland's AI Policy Framework

Poland's national AI strategy has evolved substantially since its initial adoption. The Policy for the Development of Artificial Intelligence in Poland from 2020 established the foundational architecture for Poland's AI governance. **A significant institutional shift occurred in November 2024,** when the Polish government announced the creation of a dedicated Artificial Intelligence Fund of PLN 1 billion, alongside a new cross-governmental AI Council. The Council brings together the Ministries of Digital Affairs, Education, and Defence with the Polish Development Fund (PFR), the National Centre for Research and Development (NCBR), and the National Development Bank (BGK), with a mandate to allocate funds, develop guidelines for safe and ethical AI deployment, and monitor the AI market. This announcement was accompanied by the publication of a national Digitalization Strategy to 2035 in October 2024, the launch of a public consultation on a draft AI Systems Act implementing the EU AI Act at national level, and the advancement of flagship AI projects including PLLuM (EUR 3.4 million) and the open-source Bielik 11-billion-parameter model. Infrastructure investments also accelerated, with Poland developing two AI Factories under the EU AI Continent Action Plan.

Building on these institutional developments, the Ministry of Digital Affairs published a draft **Artificial Intelligence Development Policy in Poland until 2030** for public consultation in June 2025. The **new strategy restructures Poland's approach around four cross-cutting pillars** (human capital, innovation, investment, and implementation) **and five strategic goals:** developing an efficient AI ecosystem to support economic and social well-being; ensuring effective and transparent R&D financing; building adequate computing infrastructure and data resources; developing a society with above-basic AI competences; and applying AI in health care prevention and diagnostics. Beyond strategic intent, the Policy assigns the state and State-Owned Enterprises (SOEs) a deliberate demand-side role, using public procurement and SOE adoption to drive technology uptake—a particularly important lever given that Poland's large-firm landscape is concentrated in MNE subsidiaries and state-owned entities rather than domestically headquartered private firms. The strategy sets a measurable ambition of ranking among the top 10–20 countries globally on the Tortoise AI Index, Stanford HAI Index, and Government AI Readiness Index by 2030.

Timeline of key milestones

The public sector leads on e-government and eHealth, but AI adoption requires capacity that is still being built

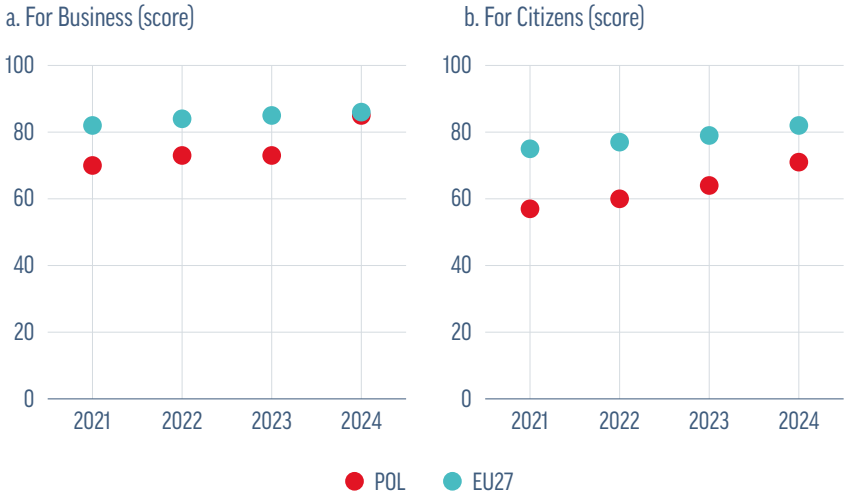
Poland's ambitious targets for AI in public services stand in contrast to uneven implementation on the ground. The Digitalization Strategy 2035 sets measurable goals (e.g., 100 medical conditions diagnosed with AI support, full electronic processing of public administration tasks) but progress toward these targets varies significantly across sectors and is not yet systematically monitored.

Poland's eGovernment performance over the past five years reflects one of the most dynamic digital transformations in the EU, but gaps remain. The country's score on Digital Public Services for Businesses rose from 70 in 2021 to 85 in 2024, nearly matching the EU average. Progress in citizen-facing services has been similarly consistent, with the score climbing from 57 to 71 over the same period, though a more visible gap relative to the EU average of 82 remains (e-government Benchmark, European Commission, 2025). The mObywatel is among the most integrated government mobile applications in Europe. AI adoption in back-office functions, however, remains limited. The capacity to specify, evaluate, and oversee AI contracts within public entities is an area identified as requiring development (Digitization Strategy 2035), and barriers including fragmented organizational structures and data access constraints continue to hinder public sector AI deployment (Implement Consulting Group 2025). The risk is that public bodies become passive recipients of vendor-driven solutions rather than informed commissioners of AI-enabled services.

In health care, the case for AI adoption is strong and the pipeline is active. Poland's eHealth system scores 92% on the Digital Decade maturity index, above the EU average of 83%, ranking sixth in Europe (European Commission, Digital Decade eHealth Indicator Study 2025). An aging population and growing care burden make AI-assisted triage, diagnostics, and workflow automation structurally necessary. Realizing the potential at scale however requires clinical validation frameworks, liability clarification, and equity-conscious deployment.

In education, AI adoption is in early stages. Poland invested in digital infrastructure for schools with EU Funds (Ministry of National Education, 2025), participates in EU digital skills initiatives and adopted a Policy for the Digital Transformation of Education in 2024. However, a dedicated standalone strategy for AI in education is still being developed (OECD 2025). This matters more in Poland than in most EU peers: the skills gap documented in this report is concentrated among workers in routine cognitive occupations—precisely the group the education and retraining system needs to reach.

FIGURE. 2.19 Digital Public Services for Business



Source: eGovernment Benchmark 2025 – Factsheets, European Commission.

Notes: Scores range from 0 to 100, where 100 represents full digitalization.

The tax framework supports AI investment but faces structural challenges

For AIVC firms—whose assets are predominantly intangible and whose investment decisions are highly sensitive to the treatment of R&D expenditure—the tax regime is a core component of the investment climate. MNEs frequently cite the unpredictability of Polish tax administration as a concern that outweighs headline rate advantages. Tax policy is the third-ranked priority for AI nearshoring competitiveness among MNEs considering Poland.

Poland's tax incentive framework offers a solid—if imperfect—foundation for AI investment. Poland is recognized as a top-tier jurisdiction for R&D tax support (OECD, 2025). In 2024, the country offered one of the lowest effective average tax rates (EATR) globally for R&D, placing it alongside leaders like Ireland and Lithuania. The core of the system rests on two instruments: the R&D Relief (introduced in 2016) and the IP Box (since 2019). The R&D Relief allows companies to deduct up to 200% of qualifying R&D costs, while the IP Box offers a preferential 5% income tax rate on profits from qualifying IP rights, including copyrights to computer programs. Since 2022, both instruments can be combined with newer reliefs targeting robotization, prototype development, and the employment of innovative workers. The Polish Investment Zone rounds out the framework with CIT exemptions, though it is structurally better suited to traditional business than to the intangible-asset-intensive nature of AI ventures.

For AI firms specifically, the framework creates opportunities but leaves critical questions unanswered. The IP Box's coverage of computer program copyrights is a natural fit for AI developers, but key ambiguities remain: whether AI-assisted IP qualifies, and whether compute and data costs can be treated as R&D. Without regulatory clarification, firms operate under legal uncertainty.

Use is growing but remains shallow and constrained by practical obstacles. Data for 2024 show roughly 7,700 entities using the IP Box (up 9% yoy) and total R&D Relief deductions exceeding PLN 11 billion (up 18% year-on-year) (Ministry of Finance). However, 85% of deductions relate to personnel costs, suggesting the relief functions more as a subsidy for skilled workers than as a broad innovation driver. Compliance burdens, inconsistent interpretation across tax offices, and documentation risks reduce attractiveness, particularly for smaller firms. A January 2025 Supreme Administrative Court ruling further narrowed scope by excluding certain fixed-asset costs.

A structural challenge complicates the framework. The OECD Pillar Two global minimum tax—effective in Poland from 2025—risks neutralizing the IP Box advantage for MNEs, as the 5% rate may be clawed back through top-up taxes. Other EU members (e.g., France and the Netherlands) have introduced Qualified Refundable Tax Credits designed to remain effective under Pillar Two.

3 UNLOCKING POLAND'S AI POTENTIAL: POLICY PRIORITIES

How can Poland accelerate its AI readiness and reap the benefits of higher AI adoption?

Making firms, workers and institutions ready.

Poland has the foundations but realizing the AI dividend requires action across firms, workers and the state

Harnessing AI effectively requires both purpose and deliberate design, and Poland has clear levers to act on. Three findings from the report shape the policy agenda. First, the impact of AI on Poland's economy can be large given the right capital and labor mobility dynamics. Second, the impact should be gradual: gains build through the decade as adoption deepens and complementary capital accumulates. Third, the impact falls disproportionately on cognitive labor. Yet the cognitive concentration of impact is the source of the deepest uncertainty. Cognitive workers are typically more mobile and possess broader skill bases supporting reallocation, but where they will move as AI reshapes demand—into new tasks, new occupations, or new combinations of both—is not pinned down by the model. At the same time, labor markets in Poland and in most countries will face frictions from imperfect reskilling and unprepared institutions to support the transitions. Addressing these weaknesses will be essential to reduce the cost on workers: given the uncertainty about reallocation pathways, the burden of adjustment may fall on individual workers, a costly and inequitable mode of transition that policy should mitigate.

The case for early action is reinforced by the technology's own trajectory. If AI capabilities continue scaling rapidly the window for proactive intervention narrows. Waiting makes reform both more difficult and less effective (Huynh, Mittal and Frank 2025). Early action also requires government capacity to understand, monitor, and regulate AI-driven economic activity: recruiting and retaining AI expertise in the public sector is a matter of national importance.

Capturing the growth dividend from the policy-consistent scenario (E3) requires closing a structural readiness gap that market incentives alone are unlikely to address, along three functional lines. **Generating the dividend** turns on firm-level adoption and on the broader ecosystem of innovation capacity, public-sector demand-setting, and legal-investment conditions that pull in the FDI flows. **Distributing the dividend** is the redistribution question that the cognitive concentration of impact makes unavoidable: training participation, reskilling capacity, talent pipelines, and social protection systems together determine whether the gain accrues broadly or concentrates. **Sustaining the dividend** runs through slow-moving foundations: formal education, fiscal modernization, and institutional architecture. Education matters but operates on a multi-decade horizon, it shapes the labor force of the 2040s and beyond. Fiscal modernization mobilizes domestic savings and transition financing while recalibrating the balance between labor and capital. And on the institutional side, the next step is consolidating overlapping advisory mandates and strengthening public sector commissioning capacity to convert the AI policy ambition into delivery.

Poland's policy priorities are set to address binding constraints to achieve the higher growth dividends

The 11 policy priorities that follow are organized into three functional buckets—generating the AI dividend, distributing it, and sustaining it. The priorities are not ranked but strategically complementary: acting on one domain in isolation would leave most of the dividend unrealized. They constitute a policy agenda calibrated to Poland's specific structural position today: an economy with strong growth fundamentals and a large, educated workforce, but one where the gap between AI exposure and AI readiness is wide enough to represent a binding constraint on long-run productivity convergence. The evidence suggests that AI's economic dividend and an equitable transition for workers are not mutually exclusive—but that outcome is conditional on adequate policies being adopted and implemented with sufficient lead time.

The table below groups each priority by its functional bucket and maps it to the macroeconomic mechanism it reinforces, its position in the AIVC, and whether it is binding for the E3 scenario or enabling.

#	Domain	Policy priority	Mechanism reinforced	AIVC link	Key stakeholder	Binding for E3?
PP1	Generating	Build managerial capacity for firm-level adoption	AI adoption pace; firm-level absorption	Application	Firms + Public sector	Yes
PP2	Generating	Strengthen AI enabling ecosystem	AI adoption pace; complementary capital	Enablement	Firms + Public sector	Yes
PP3	Generating	Strengthen innovation capacity	Technology efficiency; firm-level development	Development	Firms + Public sector	Enabling
PP4	Generating	Restore legal certainty & modernize investment promotion	FDI channel	All segments	Public sector	Yes
PP5	Generating	Activate public sector as demand and standard-setter	AI adoption pace; domestic market formation	Application	Public sector	Enabling
PP6	Generating	Build specialized AI talent pipeline	Labor mobility; FDI channel	All segments	Public sector + Firms + Workers	Enabling
PP7	Distributing	Scale reskilling and close training participation gap	Labor mobility	All segments	Public sector + Firms + Workers	Yes
PP8	Distributing	Adapt social protection to AI-driven displacement	Labor mobility; transition support	All segments	Public sector	Yes
PP9	Sustaining	Strengthen formal education for AI transition	Labor mobility (long run); foundational skills	All segments	Public sector	Enabling
PP10	Sustaining	Modernize fiscal policy	Domestic savings mobilization; transition financing	All segments	Public sector	Enabling
PP11	Sustaining	Reinforcing institutions	All mechanisms	All segments	Public sector	Enabling

POLICY PRIORITY 1

Build managerial and organizational capacity to drive firm-level AI adoption

Moving from isolated experimentation to firm-wide transformation requires aligned processes, incentives, and skills—and above all, the organizational capacity to coordinate change. This is not a matter of training workers alone: as Sadun, 2025 argues, technology creates capacity, but organizations determine value, and aggregate productivity effects materialize only when AI shifts from point solutions to system-level redesign of production processes (Bloom, Sadun and Van Reenen 2012).

The stakes are heightened by a structural risk specific to AI diffusion. As similar tools generate commodity-like outputs across firms and sectors, differentiation becomes harder and a ceiling emerges on AI-enabled competitiveness—what Huang and Rust, 2025 term the "average trap." This risk is particularly acute for Poland, where firms have historically struggled to build globally recognizable brands and scale products under Polish names. Generic AI outputs could further compress distinctiveness. The antidote is not better tools but stronger management: clear use cases, redesigned workflows, quality governance, and integration with proprietary data are what convert generic point solutions into firm-specific systems that are harder to replicate.

The path forward runs through firms, with targeted public support where the constraint binds hardest:

1. **Firms are the primary implementers of managerial capacity-building.** Change management, workflow redesign, and quality governance are management tasks. In addition to internal resources and paid consulting support, industry associations, employer federations, and peer learning networks are the natural vehicles; MNE subsidiaries can serve as knowledge-transfer nodes into domestic supply chains, a currently underused channel.

2. **Public support should target the micro, small and medium Enterprises (MSMEs) segment, where internal capacity is thinnest.** Practical advisory services, training co-financing, and change-management programs can lower the cost of organizational adaptation and incentivize uptake. A World Bank-supported program in Poland found that SMEs receiving both financing and a 12-week managerial capacity-building program increased their digital tool use by 12%, while firms receiving finance alone saw no measurable improvement (World Bank, 2023).

3. **Worker involvement in how AI is introduced is part of good managerial practice, not separate from it.** The strongest case comes from the firms themselves: when AI is introduced in consultation with workers and paired with training, 79% of workers report using AI tools and 66% want to use them more (NASK, 2025).

Firms that received both financing and a 12-week managerial capacity-building program increased their use of digital tools by

12%

World Bank, 2023

POLICY PRIORITY 2

Strengthen the AI enabling ecosystem

Firm-level organizational capacity is necessary but not sufficient if the external ecosystem constraining adoption remains underdeveloped. Even well-managed firms cannot fully leverage AI if access to affordable computing infrastructure, high-quality data, and capable AI providers and integrators is limited or concentrated. Poland's AI enabling ecosystem faces structural gaps on each of these dimensions that market forces alone are unlikely to close at the speed or scale required.

Four priorities stand out:

1. **Expanding access to affordable computing**—including through shared public infrastructure and cloud procurement frameworks—reduces the fixed cost barrier that currently limits AI experimentation to larger firms;

2. **Supporting the development of high-quality, sector-relevant datasets,** including through data-sharing frameworks and public data infrastructure, addresses one of the most binding constraints on applied AI development in Poland's key sectors;

3. **Investing in applied R&D and the market for AI providers and integrators**—through competitive grants, innovation procurement, and support for technology intermediaries—builds the domestic supply side that firms depend on to move beyond off-the-shelf tools;

4. **Finally, using public procurement strategically, alongside interoperability standards,** can help scale sector-ready AI solutions that are designed for the specific regulatory, linguistic, and operational context of Polish firms rather than imported generic platforms.

Taken together, these supply-side interventions complement the organizational capacity agenda in PP1: they lower the cost and complexity of adoption for firms that are ready to move, and they build the ecosystem depth needed to sustain AI-driven productivity growth beyond the current early-adopter phase. They should be complemented with investments in infrastructure such as energy and 5G as well as data governance reforms (Insights #11).

POLICY PRIORITY 3

Strengthen Poland's innovation capacity and startup ecosystem

Succeeding in the AIVC requires Poland to address weaknesses in its innovation ecosystem. Despite significant progress over the past decade, Poland ranks 23rd in the European Innovation Scoreboard 2025, surpassing only the Slovak Republic, Latvia, Bulgaria, and Romania. Structural weaknesses are concentrated across three dimensions (World Bank 2026): Firm-level innovation capacity is limited: only 15% of Polish SMEs introduced new or improved products in recent years, compared to an EU average of 27%, and just 8–10% engage in innovation collaboration. University-industry linkages are among the weakest in the EU: Poland reaches only 56.6% of the EU average in public-private co-publications, universities face weak commercialization incentives, and industry-funded higher education R&D is below the OECD average. Access to risk capital is also constrained, with VC investment below the EU average and banks facing limited incentives to finance intangible, high-risk R&D.

These weaknesses have a distributional dimension. Poland's current AIVC position is concentrated in the application layer, largely operated by foreign MNEs through brownfield expansion of existing subsidiaries (Section 2.1). This generates productivity gains and supports BSS employment, but a substantial share of capital-side returns from AI is likely to accrue to parent companies abroad. The report's modeling shows total capital returns rising substantially under AI diffusion; without a deeper innovation ecosystem, a meaningful portion of that capital share will be repatriated rather than retained domestically. Moreover, the number of new technological firms with high-growth potential (startups) is below what would be expected for an economy of Poland's size. Strengthening innovation capacity is therefore not only about moving up the value chain or attracting foreign R&D but about widening the domestic firm base that can absorb spillovers from MNE-led activity and develop independent AI capacity.

The path forward runs through the private innovation ecosystem, with the state removing frictions, sharpening incentives, and enabling and mobilizing market-based finance:

1. **Recalibrate the incentive environment for firm- and university-led commercialization;**

2. **Connect existing AI assets into a coherent architecture through industry-led consortia.** The Piast and Gaia AI Factories, PLLuM, Bielik, and foreign R&D centers operating in Poland are the building blocks of a national AI innovation system; the state's role is to broker connections and reduce duplication;

3. **Deepen VC markets and innovation finance,** with greater reliance on market-based instruments, mobilization of private capital, and more developed capital markets to support firm growth and provide viable exit pathways, with the public sector playing a facilitating role.

More details on policy options are outlined in World Bank report Innovation Rising, 2026.

POLICY PRIORITY 4

Restore legal certainty and modernize investment promotion to unlock AI-related FDI

Legal certainty is the binding constraint on Poland's attractiveness as an AI investment destination. Only 39% of companies in Poland are confident that the law and courts will protect their investments if something goes wrong—one of the lowest rates in the EU—with 71% of skeptics citing frequent legislative changes and 69% pointing to difficulty enforcing rights in court (Eurobarometer 555, 2025). Among MNEs aware of or considering Poland for nearshoring, 66% identify enhancing legal certainty and safeguarding investor rights as the top reform priority. An additional 40% of missing investors—those who considered Poland but did not commit—indicate they would reconsider if their main concerns were addressed within three to five years.

Poland's investment promotion framework needs modernization to better capture emerging segments of the global AI economy. Currently calibrated toward capital-intensive manufacturing FDI, the framework may benefit from adaptation to accommodate AI nearshoring firms, which tend to operate with leaner structures, intangible-heavy asset bases, and highly mobile talent pools.

Modernizing the framework requires four targeted actions:

1. **Revising minimum investment thresholds and eligibility** criteria to reflect the operational realities of AI firms (e.g., asset-lighter, R&D intensive structure), while **strengthening legal protections** for intangible assets and intellectual property;

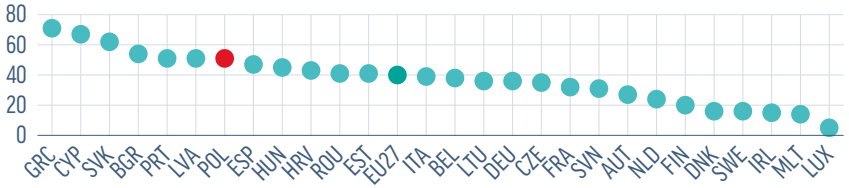
2. **Strengthening focus on supplier development programs and technology transfer schemes from MNEs to local firms;**

3. **Streamlining expat visa and work permit procedures** to enable rapid deployment of specialized talent;

4. **Reducing domestic administrative frictions on digital trade governance while engaging at the EU level on cross-border data flow provisions** that matter to AIVC.

FIGURE 3.1 Perceived lack of legal protection by country (2025)

Fairly + very unconfident, % of firms

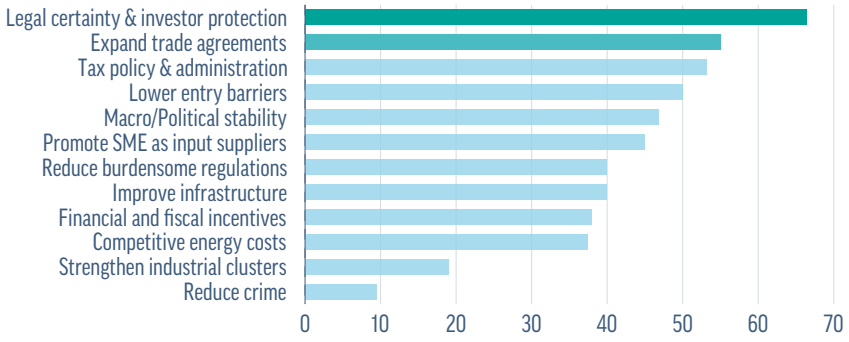


Source: European Commission Flash Eurobarometer survey of firms (n=12,856).

Notes: Share of firms reporting they are fairly or very unconfident that investments are protected by law and courts if something goes wrong.

FIGURE 3.2 What would strengthen Poland's nearshoring competitiveness?

n=158 (%)



Source: World Bank MNE AI survey Poland, 2025

POLICY PRIORITY 5

Activate the public sector as a demand and standard-setting lever for the domestic AI market

Public procurement is Poland's most underused lever for catalyzing a domestic AI market. Poland's public sector spent PLN 587 billion in 2024—equivalent to 16% of GDP—a demand instrument of macroeconomic weight. The State Purchasing Policy 2026–2029 explicitly elevates AI by requiring public buyers to assess systematically the potential of AI technologies at the planning stage of procurements, wherever justified. Yet the policy's current ambition, a 10% increase in innovation-incorporating procurements by 2029, from a base of just 113 in 2024, is inconsequential relative to the scale of overall purchasing. A more decisive use of this lever, directed toward domestic AI integrators (i.e., the firms that bridge technology with real-world deployment in administrative processes), would accelerate the development of a home-grown market segment that today remains thin.

The public sector is also the most powerful standard-setter in the emerging AI market. Procurement specifications for quality, transparency, cybersecurity, and interoperability become de facto market-wide benchmarks that all suppliers—domestic and foreign—must meet. With the EU AI Act phasing in from 2025, Poland has an opportunity not merely to absorb incoming rules but to shape how they apply in practice, and to give well-prepared local integrators a structural advantage in both public and private contracts.

Activating both levers requires four procurement design choices that build domestic capability without triggering EU procurement-law exposure:

1. **Breaking large contracts into modular lots** accessible to Polish SMEs and AI integrators, replacing domestic-content quotas that would conflict with EU procurement rules;
2. **Requiring knowledge transfer and co-development clauses** in MNE-led contracts, so capabilities embedded in delivery accumulate locally rather than offshore;
3. **Mandating open architectures maintainable by Polish firms,** preventing lock-in to single foreign providers and protecting long-term sovereignty over critical public systems;
4. **Awarding evaluation points for local employment, R&D activity, and AI Act compliance,** rewarding domestic capability-building without insulating firms from the competitive pressure they need to grow.

POLICY PRIORITY 6

Build a specialized AI talent pipeline beyond general IT

Poland's talent base is its most consistently cited competitive advantage—but the nature of that demand is shifting faster than the educational and training pipeline. Skilled workforce availability is the dominant factor in nearshoring decisions, identified as critical by 73% of nearshoring MNEs, ahead of economic stability, geographic proximity, and labor costs. Within that demand, specialized AI and ML engineering (i.e., the capacity to fine-tune models, integrate APIs, and deploy AI systems in production environments) is identified as the critical skill gap by 65% of nearshoring MNEs. Domain-integrated expertise, combining sector knowledge with AI application capability, is the second major gap: supply chain optimization, for instance, requires collaboration between logistics specialists and data scientists, not generic software engineers.

Sustaining Poland's talent advantage requires deliberate action on two fronts—upgrading the domestic pipeline from general IT to specialized AI capability (1–3) and actively attracting specialized talent from abroad (4–6). Domestic supply alone cannot meet the pace of demand at the most specialized end of the AI skills spectrum. Actions could include:

1. **Expand university and vocational training capacity in ML engineering and production-ready AI deployment;** targeting female participation in such programs to address the disproportionate exposure of current female-held jobs, stemming from "traditional" occupational segregation;

2. **Build stronger linkages between AI firms, higher education institutions** and research institutions to develop applied R&D pipelines that retain specialized talent (in line with PP3);

3. **Support domain-specific AI training programs in sectors where Poland has deep existing expertise and where AI nearshoring demand is concentrated**—manufacturing, finance, logistics, and health care;

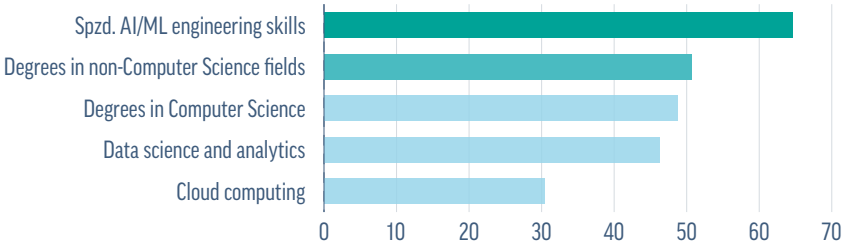
4. **Streamline visa and work permit procedures to integrate foreign AI specialists,** removing the bureaucratic frictions that currently slow non-EU hiring even under EU Blue Card schemes;

5. **Develop a fast-track residence pathway for high-skilled AI professionals,** modeled on schemes already operating in Germany, the Netherlands, and Estonia;

6. **Position Poland as a destination brand for talent** from third markets with deep AI engineering capacity, in coordination with the investment-promotion modernization in PP4.

FIGURE 3.3 Skills and capabilities to attract nearshoring AI investment

% of the respective surveyed group



Note: Multi-response question; shares sum to >100%. Share of total investors sample (N=158). The reported estimates are highly precise, i.e., MoE ≤ ±7.5%. Question: What skills and capabilities should be promoted by key stakeholders to provide a skilled labor force in the AI value chain segments in Poland?

POLICY PRIORITY 7

Scale reskilling and close the training participation gap among Polish adults

Poland faces a twin reskilling challenge: the skills AI demands are shifting faster than firms and workers can respond, and a structural participation gap means training is not reaching those who need it most. Polish workers report needing training at substantially higher rates than EU peers while participating at significantly lower rates, with a gap of 5.3 pp (Lewandowski et al., 2025). Workers in mid-skill, routine cognitive roles—whose displacement risk is highest—are precisely those whose access to structured reskilling is most constrained. The macro modeling in this report shows that the size of the growth dividends and the extent of displacement depend in large part on whether workers can transition into AI-complementary roles in time.

Poland's BSS sector illustrates both the scale of the need and the cost of moving too slowly. Nearly half of Polish BSS firms have trained only a small share of employees in AI-related skills, and most report productivity gains as modest (ABSL, 2025). Global evidence confirms the pattern: in economies with large service-export sectors, skill gaps in business services generate economy-wide spillovers, making reskilling a structural economic priority (IMF, 2025; WEF, 2025).

Closing the gap requires action supported by the government both at the firm and worker levels:

1. **Enhance the certification system for non-formal training providers and non-formal reskilling programs** (by enterprise and private entities);

2. **Assess and review co-financing rates for AI-related upskilling under the National Training Fund (KFS) and simplify procedures for SMEs,** where take-up is currently lowest;

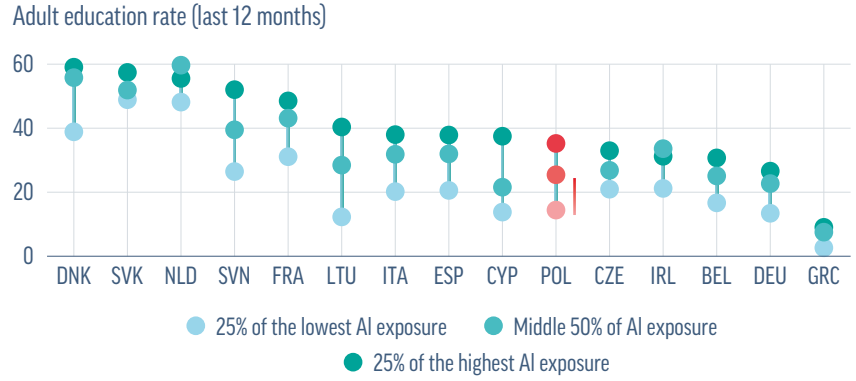
3. **Foster the development of sector-specific programs with industry associations, leading firms, and universities to ensure training content tracks where AI is reshaping task demand;**

4. **Institutionalize the role of the private sector through sectoral skills councils** to maintain alignment between training content and labor-market needs as those needs shift;

5. **Introduce portable training entitlements that make access independent of employer willingness,** addressing the evidence that older workers (50–64) are least likely to participate;

6. **Strengthen targeted outreach for female and mid-career workers facing the highest displacement risk,** so reskilling reaches the cohorts most exposed to task recomposition rather than the workers already most likely to participate (ILO 2026).

FIGURE 3.4 Polish workers participate less in formal training than leading EU innovators



Source: EU-LFS 2022 Ad hoc module on skills. Lewandowski et al., 2025 AI PIAAC measure

POLICY PRIORITY 8

Adapt social protection and labor policies to respond to AI-driven job displacement

AI-related displacement differs from previous automation waves in ways that matter for social protection design. Earlier waves primarily affected low-skill, routine manual tasks; AI extends displacement risk to a broader range of cognitive and service occupations—precisely those Poland's social protection system was not designed to support through extended structural transitions. Social protection can cushion displacement costs by supporting consumption during unemployment, facilitating better job matching, and enabling skills acquisition, but only if benefit coverage, duration, and portability are adequate to the transition (Brollo et al., 2024). Poland's existing system provides a solid but insufficiently flexible foundation. Unemployment benefits run up to 12 months depending on contribution history and local unemployment rates, with severance entitlements for workers in firms of more than 20 employees (OECD TaxBEN, 2024). Labor Offices provide job search assistance, vocational training, and wage subsidies. These instruments are adequate for cyclical unemployment but poorly suited to the structural transitions AI is driving, where displaced workers may need to shift into entirely new occupational categories over multi-year horizons.

Four reforms should be prioritized:

1. **Set up a system to monitor indicators on AI-related skills and occupations in demand that would trigger the introduction of new policies, including redistribution policies on universal income support and changes in labor regulation;**

2. **Re-orient Active Labor Market Programs and Labor Offices toward AI-complementary occupational pathways**—adapting counseling, training subsidies and vouchers, and wage subsidy schemes to the skills the labor market is creating rather than shedding; ensure Active Labor Market Policies are informed by real-time labor market on skills and occupations in demand;

3. **Extend unemployment insurance duration and improve wage replacement rates for workers in high-exposure occupations** undertaking certified retraining, and guaranteeing portability of health and social insurance contributions regardless of employment status;

4. **Introduce a temporary wage top-up benefit targeted to workers who find re-employment at lower wages after displacement.** Occupational downgrade could be an outcome of AI diffusion-led changes. Wage top-ups for downgraded workers are generally a complement to unemployment insurance to provide temporary income support during the transition to suitable jobs (should they be available).

The policy framework above assumes that displaced workers can, with adequate support, transition into AI-complementary occupations over multi-year horizons. This assumption holds in the labor mobility scenarios that anchor the report's modeling (E3 with high mobility), but it may understate the challenge if the cumulative effect of AI on cognitive work and embodied AI compresses the set of occupations where re-employment is realistic. The report does not jointly model this dynamic. If the dual shock proves more disruptive than supply-side adjustment can absorb, the policy debate will need to engage with instruments that do not depend on full re-employment (IMF, 2026). These include work-sharing arrangements and reduced-hours schemes that distribute available work across a larger workforce; public employment programs that provide stable employment outside the displaced sectors; and income support mechanisms decoupled from labor market participation, such as universal basic income (UBI) and AI dividend proposals that redistribute to workers some of the productivity gains accruing disproportionately to capital owners under AI-driven structural change. The academic case for redistributive responses to AI-driven inequality is well-established (Growiec, 2022; Korinek 2024), even as the specific design of mechanisms remains an active area of policy development.

POLICY PRIORITY 9

Strengthen the formal education sector for the AI transition

Poland's education system faces a skills-readiness challenge that predates AI but is being sharply accelerated by it. PIAAC data show that 40% of Polish adults aged 25–64 have literacy skills at or below Level 1—well above the OECD average of 27% (OECD Education at a Glance, 2025). These deficits are most pronounced among older workers and those with lower educational attainment.

Education reforms operate on a multi-decade horizon—the cohort entering primary school today will not reach the labor market until the 2040s—which places this priority firmly in the sustaining agenda, distinct from the more immediate reskilling levers in PP7. Within that horizon, the system faces a dual mandate it is not yet equipped to fulfill: closing the skills gap AI is creating, and using AI itself to do it faster and at greater scale. A dedicated AI-in-education strategy is still being developed (OECD, 2025), leaving the system without a coherent framework for integrating AI into teaching, learning, and institutional practice. The OECD–European Commission joint AI Literacy Framework for Primary and Secondary Education provides a global reference point, defining four dimensions of AI literacy: understanding, using, creating with, and critically engaging with AI (OECD/EC, 2025). Poland should anchor its national strategy to this framework while adapting it to the occupational and demographic profile of its labor market.

Four clusters of reform are required:

1. **Integrate AI literacy** (principles, applications, limitations, ethical implications) **into curricula** from primary through secondary education, while strengthening foundational literacy, numeracy, and socio-emotional skills from preschool. AI-complementary skills (e.g., critical thinking, adaptability, contextual judgment) are built on strong foundations, not as substitutes for them (OECD, 2025);

2. **Introduce mandatory AI professional development covering AI literacy, prompt engineering, and the evaluation of AI-generated outputs,** alongside clear ethical guidelines for responsible use and student data privacy. With staff shortages in OECD schools nearly doubling between 2015 and 2022, Poland cannot afford to add digital skill gaps to an already stretched workforce;

3. **Develop and expand the provision of modular, stackable, and free or low-cost certifications (micro-credentials) in AI literacy,** prompting, and responsible AI use to encourage continuous reskilling, specifically targeting those at risk of displacement;

4. **Make entrepreneurship education a core competence-building policy.** Poland should embed practical modules on customer discovery, product testing, sales, finance, equity, hiring, failure and restarting across schools, vocational education and universities. The central metric should be whether more people see founding a company as a credible professional path.

POLICY PRIORITY 10

Modernize fiscal policy to share the AI dividend and finance the transition

AI will not destabilize Poland's public finances, but it will change their structure. AI adoption raises GDP and improves debt dynamics, but most of the income gains accrue to capital rather than labor, narrowing the bases for personal income tax and social security contributions, with only partial offset from CIT and VAT. Without policy adjustment, this shift risks weakening redistribution precisely as transition pressures intensify.

Fiscal policy should therefore pursue three joint objectives: preserve revenue adequacy, improve equity in the distribution of AI gains, and create fiscal space to support workers through adjustment—without undermining growth. Acting early to realign tax bases and scale transition support allows Poland to convert AI-driven productivity gains into inclusive growth, fiscal resilience, and political sustainability—rather than confronting sharper distributional conflicts later with fewer policy instruments available.

Three reform tracks should be pursued in parallel:

1. **Rebalance the tax base toward consumption and capital using existing instruments.** As AI shifts income away from labor, VAT and CIT become more stable revenue anchors than labor-based instruments, and more effective than narrow automation or robot taxes—which are easily shifted onto prices and workers. Strengthening VAT compliance and narrowing collection gaps, alongside rebalancing taxation toward the capital and rents generated by AI, are higher-return moves. While deep reforms in capital taxation require a coordinated approach at the international level, there are some measures that Poland can adopt in the medium-term. Tightening the 9% reduced CIT rate could reduce revenue leakages through artificial splitting and broaden the tax base without penalizing genuine small taxpayers; a marginal increase of profit threshold to access the 10% minimum income tax (currently 2% of revenue) could capture more revenue from companies that structurally report low profitability despite strong turnover. Investing in tax administration capacity for transfer pricing audits—particularly for intra-group financial transactions, royalties, and management fees—is also a high-return option;

2. **Simplify and refocus existing tax incentives** (R&D reliefs, IP Box provisions, Allowance for Corporate Equity, and similar instruments) toward additional innovation and adoption or toward firms with higher growth potential, provided that policy certainty and base protection are preserved under OECD Pillar Two. Reforms should start with a simple question: do current incentives generate new R&D and AI investment, or mostly subsidize activity that would have happened anyway? Any redesign should be grounded in this assessment;

3. **Free up fiscal space for AI-related transition costs, capital expenditure, and investment in tangible and intangible capital, not only by raising new revenue.** Poland enters the AI era with one of the highest public-spending levels in the EU—50.9% of GDP in 2025, against an EU average of 49.5%. A systematic spending-efficiency review targeting untargeted transfers and low-value subsidies is a precondition for financing transition support and increasing the fiscal space to finance intangible and tangible assets without widening the structural deficit.

POLICY PRIORITY 11

Consolidate the institutional architecture and strengthen delivery capacity

Poland's institutional architecture for AI governance is well-designed on paper. The Ministry of Digital Affairs as strategic coordinator, KRiBSI as market surveillance authority under the EU AI Act, AI Hub Poland as the public-sector implementation platform, a dedicated AI Fund, regulatory sandboxes, and an AI Observatory—taken together, this maps closely onto international best-practice governance frameworks, anchored by a credible strategic document. The risk Poland faces is not one of design but of execution. Institutions that exist on paper without the right internal logic, talent, and accountability are a common AI governance failure mode internationally—and one Poland's historical experience with public administration reform gives it particular reason to guard against.

Three reforms could determine whether design becomes delivery:

1. **Concentrate scarce talent before building structures.** The rarest resource in AI governance is not funding or legal authority but people who understand both how AI systems work and how regulatory processes function. Poland should treat recruitment, retention, and continuous development of this cadre as a key implementation priority: salaries competitive with the private sector, active secondment programs between public institutions and industry, and a deliberate strategy to retain talent that would otherwise migrate or leave the country.

2. **Give institutions the right incentives, not just the right mandates,** through mechanisms such as transparent appointment processes for leadership, performance frameworks that reward substantive outcomes rather than procedural compliance, published reasoning for significant regulatory decisions, and genuine whistleblower protection for staff who identify failures.

3. **Redesign feedback loops for adaptive governance.** Most AI observatories—including those being planned across EU member states—are designed for retrospective reporting: they measure what has happened and publish it annually. This is insufficient for a technology that evolves faster than policy cycles. Poland's AI Observatory should be designed from the outset as a real-time early-warning system, tracking leading indicators of labor-market displacement, algorithmic discrimination, and market concentration, and triggering automatic policy review when pre-defined thresholds are breached. This requires a direct institutional link between the Observatory and bodies with authority to act on its findings—and, on the citizen side, accessible mechanisms for explanation, contestation, and meaningful consultation when AI affects significant decisions about people or is deployed in public services. The feedback loop closes only when both system-level and citizen-level signals can trigger institutional response.

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