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Online annex: BIS Bulletin no 130: AI and the global economy: implications for central banks

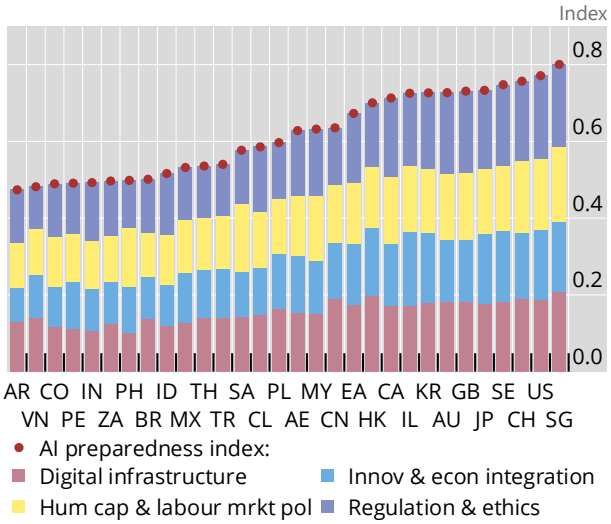
This online annex provides additional evidence of cross-country heterogeneity in artificial intelligence (AI) preparedness and its implications for growth, investment and labour markets. It also provides estimates of the near-term macroeconomic implications from AI and discusses labour and financial market dynamics.

The AI preparedness index (AIPI) from Cazzaniga et al (2024) measures structural factors that are relevant for AI adoption. It combines four equally weighted components: digital infrastructure, human capital and labour market policies, innovation and economic integration, and regulation and ethics (Graph A.1.A). Preparedness varies substantially across countries, with advanced economies (AEs) generally better positioned. The AIPI is strongly correlated with employment shares in sectors with a higher prevalence of cognitively intensive tasks, which are more exposed to generative AI (Graph A.1.B).

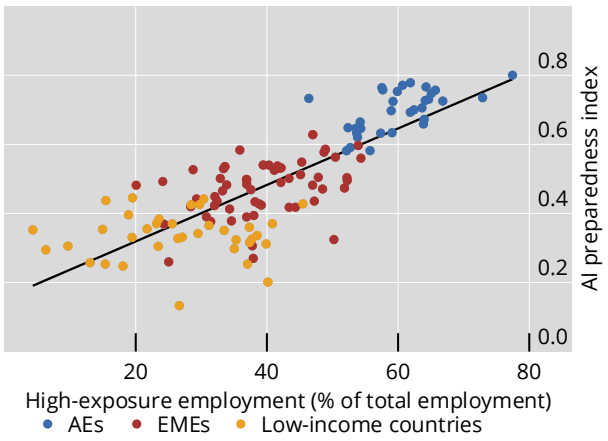
AI preparedness differs across countries

Graph A.1

A. AI preparedness index: dimensions[1]



B. AI preparedness index and employment share in high-exposure occupations



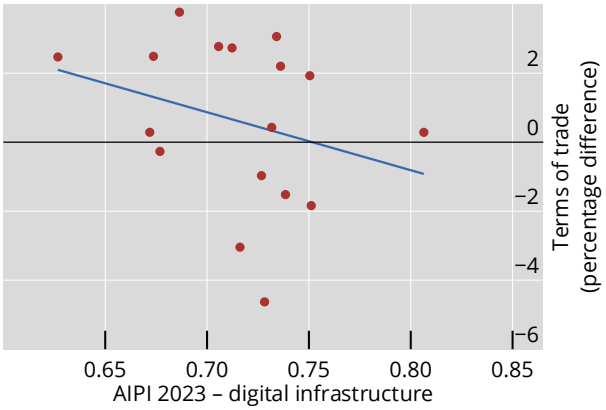
[1] The AI preparedness index (AIPI) covers 174 countries as of 2023 and is computed as the sum of four equally weighted components: digital infrastructure, human capital and labour market policies, innovation and economic integration, and regulation and ethics. Each component is derived from multiple macro-structural indicators, sourced from different international institutions. The AIPI ranges from 0 to 1, with higher values indicating greater AI preparedness. For EA, simple average of all EA economies.

Sources: Cazzaniga et al (2024); Cerutti et al (2025); Gambacorta, Kharroubi et al (2026); IMF; BIS.

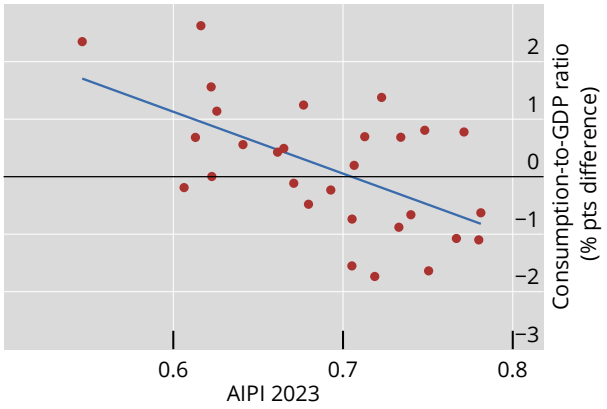
Greater AI exposure is associated with weaker terms of trade and a lower consumption-to-GDP ratio. In economies with higher AI digital infrastructure scores, import-intensive investment in digital infrastructure appears to have weighed on the terms of trade (Graph A.2.A). Higher AI preparedness is also generally associated with a reduction in the consumption-to-GDP ratio, consistent with an investment-led impulse (Graph A.2.B).

AI exposure comes with weaker terms of trade and a lower consumption-to-GDP ratio Graph A.2

A. Terms of trade vs AIPI digital infrastructure[1]



B. Consumption-to-GDP vs AI preparedness[2]



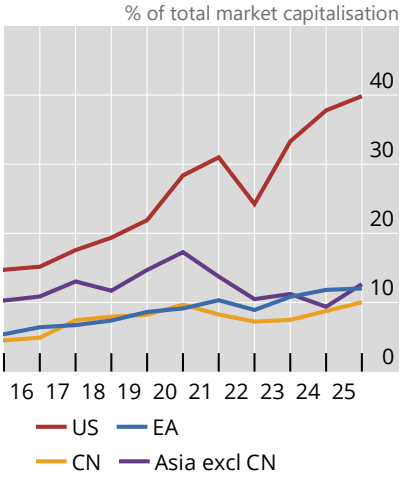
[1] Dots plot the percentage change in terms of trade between Q4 2023 and Q4 2025 against the level of the digital infrastructure component of the AI preparedness index in 2023. The blue line indicates the relationship between the two. Country sample: AU, BE, CA, CH, DE, EE, ES, FI, FR, GB, IT, JP, KR, LT, LU, NL, NO, PT, SE, TR and US. [2] Dots plot the ratio of private consumption to GDP between Q4 2023 and Q4 2025 against the level of AI preparedness in 2023. The blue line indicates the relationship between the two, controlling for the private consumption-to-GDP ratio in Q4 2023. Country sample: AU, BE, CA, CH, DE, DK, EE, ES, FI, FR, GB, IT, JP, KR, LT, LU, NL, NO, PL, PT, SE, SK, TR and US.

Sources: IMF; OECD; BIS.

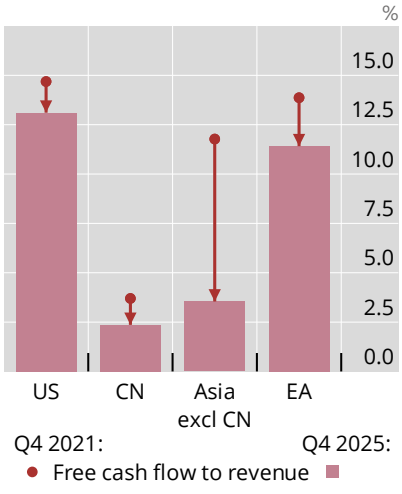
AI firms' market capitalisation has bas been rising, though the effects have been uneven across countries (Graph A.3.A). Meanwhile, available cash flows of AI firms have declined significantly as their capital expenditures have increased markedly in recent years (Graph A.3.B, red arrows). These higher capital expenditures have created external financing needs, contributing to a surge of outstanding private credit loans to AI-related firms from near zero in 2016 to $200 billion in 2025 (Graph A.3.C).

Rising capital expenditures require external financing Graph A.3

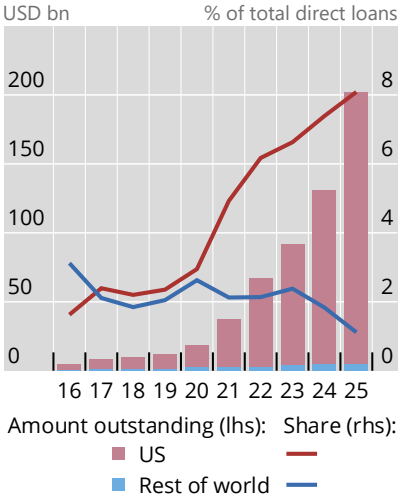
A. AI firms' market capitalisation is rising, especially in the United States[1]



B. AI firms' capital expenditures are growing faster than cash flows[1, 2]



C. Direct lending to AI firms in the United States is growing fast[3]



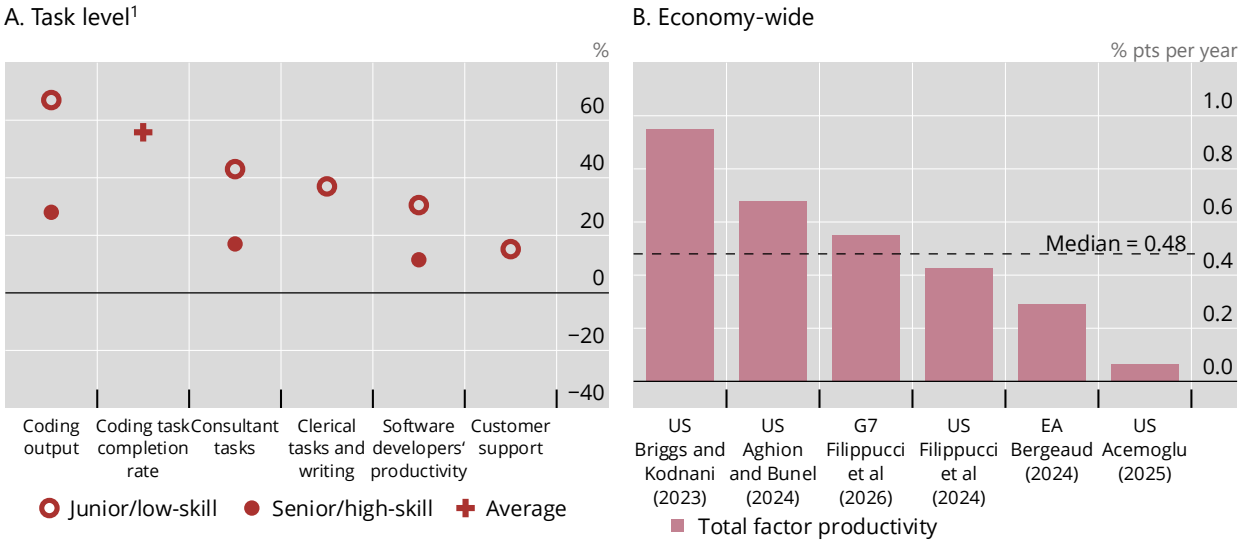
[1] "AI firms" comprise 298 publicly listed firms in Capital IQ, as classified in Rishabh and Shreeti (2026). Asia excl CN = HK, IN, JP, KR and SG. [2] Free cash flow is defined as cash flow minus capital expenditures. Arrows indicate the change between Q4 2021 and Q4 2025. [3] "AI firms" refers to firms operating in the Pitchbook-defined verticals "Artificial Intelligence", "Big Data" and "Cloud Tech".

Sources: Aldasoro et al (2026); PitchBook Data Inc; S&P Global Market Intelligence; national data; BIS.

Estimates of the productivity effects of AI vary considerably, and both their magnitude and persistence remain uncertain. At the task level, AI can deliver sizeable productivity gains and may compress performance differences, as less experienced workers may often benefit more than senior ones (Graph A.4.A). While the extent to which these micro-level gains will translate into higher aggregate total factor productivity (TFP) remains uncertain, median estimates across studies suggest an increase in annual TFP growth of around 0.5 percentage points (Graph A.4.B).

Estimates of productivity gains from AI vary

Graph A.4



[1] Data sources for task-level productivity gains: coding output from Gambacorta, Qiu et al (2026); coding task completion rate from Peng et al (2024); consultant tasks from Dell'Acqua et al (2023); clerical tasks and writing from Noy and Zhang (2023); software developers' productivity from Cui et al (2025); and customer support from Brynjolfsson et al (2025).

Sources: Acemoglu (2025); Aghion and Bunel (2024); Bergeaud (2024); Briggs and Kodnani (2023); Brynjolfsson et al (2025); Cui et al (2025); Dell'Acqua et al (2023); Filippucci et al (2024); Filippucci et al (2026); Gambacorta, Qiu et al (2026); Noy and Zhang (2023); Peng et al (2024); BIS.

Cross-country evidence suggests that some of the productivity effects may already materialise, with higher AI preparedness as of 2023 correlating positively with labour productivity growth over the past two years (Graph A.5.A). The available evidence suggests that AEs have been better positioned to capture the near-term gains, while outcomes across emerging market economies (EMEs) are more heterogeneous (Graph A.5.B). These effects mainly reflect differences in AI adoption rather than countries' position in the AI supply chain; the stronger effects in AEs are largely due to their sectoral composition.[1]

AI preparedness is also associated with differences in labour market matching efficiency, as reflected in the slope of the Beveridge curve. Lower AI preparedness is linked to weaker matching efficiency and a flatter Beveridge curve (Graph A.6.A). By contrast, economies with higher AI preparedness tend to exhibit a steeper vacancy–unemployment relationship (Graph A.6.B).

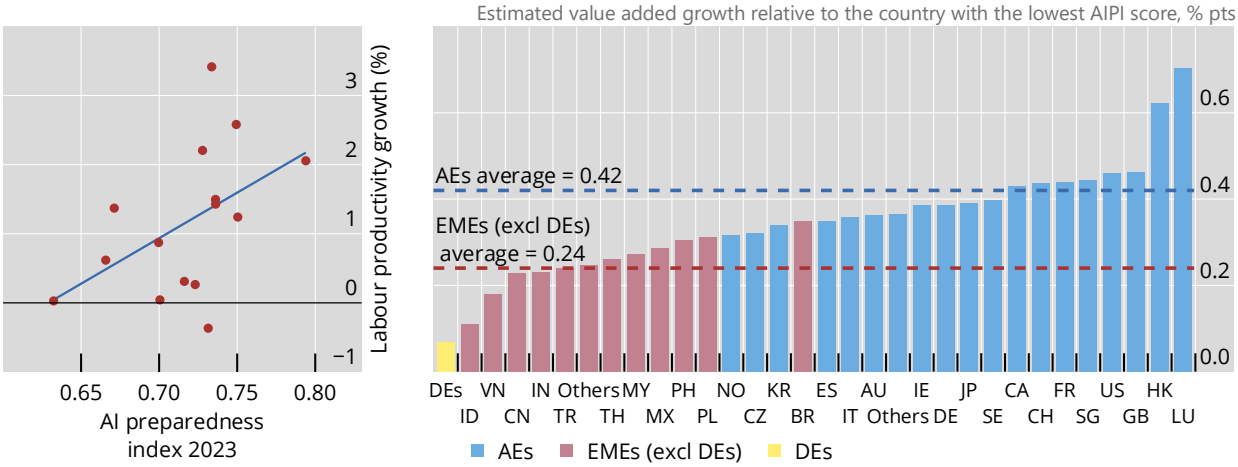
[1] See Gambacorta et al (2025).

AI and economic performance: early productivity gains and growth effects

Graph A.5

A. AI preparedness associated with labour productivity growth[1]

B. Estimated short-term growth impact of AI varies widely across countries[2]



[1] Dots plot the percentage change in labour productivity between Q4 2023 and Q4 2025 against the AI preparedness index score in 2023. The blue line indicates the relationship between the two. Country sample: AU, BE, CA, DE, EE, ES, FI, FR, GB, IS, IT, JP, KR, LU, NL, NO, PT, SE and US. [2] Based on the approach to estimate the short-run growth effects of AI in Gambacorta et al (2025); estimates computed relative to the country with the lowest AI preparedness index (AIPI) score in the sample (Cambodia). DEs = developing economies, simple average of BD, KG, KH and NP. "Others" in EMEs: BG, FJ, HU, KZ, LK, MN, RO and RU. "Others" in AEs: AT, BE, CY, DK, EE, FI, GR, HR, LT, LV, MT, NL, PT, SI and SK.

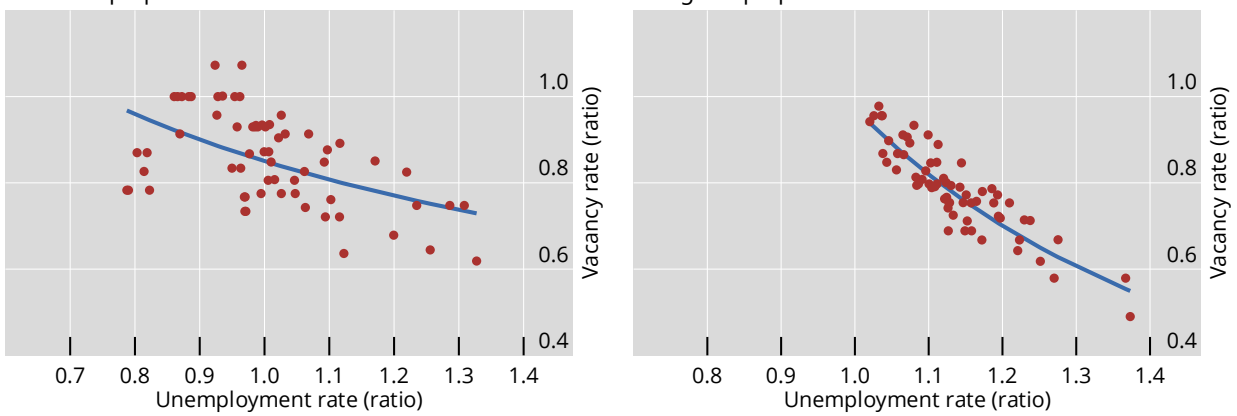
Sources: Gambacorta et al (2025); IMF; national data; BIS.

Countries with high AI preparedness face a steeper Beveridge curve[1]

Graph A.6

A. Low AI preparedness index score

B. High AI preparedness index score



[1] Unemployment and vacancy rates in Q1 2024–Q4 2025 relative to their Q1–Q4 2023 average. Country sample: AT, BE, CA, ES, FR, IT and PT (panel A); AU, CH, DE, GB, NL, SE and US (panel B). A high AIPI score refers to scores above the median of the global distribution, indicating a relatively strong capacity to adopt, develop and benefit from AI technologies. More details on the AIPI are provided in Cazzaniga et al (2024).

Sources: IMF; national data; BIS.

Additional information for Graph 1

- Graph 1.A: The US IT series sums spending on data centres (including equipment), IT manufacturing facilities, software and other IT equipment. The US data centres series includes data centres (including equipment) and IT manufacturing facilities only. The EA series sums investment in computer hardware, telecommunications equipment and software and databases. The CN series includes fixed asset investment in information transmission, software and IT services, plus computer, communications and other electronic equipment manufacturing. The AU series sums capital expenditures on buildings and equipment in the information, media and telecommunications sectors.
- Graph 1.B: The series for AI infrastructure uses Gartner's 2024 and 2025 estimates. The 2026–30 bands correspond to forecasts by Goldman Sachs and Nvidia's CEO (lower and upper bounds, as reported by Reuters). The series for data centre capital expenditures uses Dell'Oro's 2024 estimate. The 2026–30 bands correspond to forecasts by Dell'Oro (lower bound) and Omdia (upper bound).

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