

Impact of AI Diffusion on Economic Growth and Financial Stability

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Tomoyuki Shimoda brings 35 years of experience as a senior policymaker at the Bank of Japan (BoJ), the International Monetary Fund (IMF) and the Bank for International Settlements (BIS). He has extensive expertise in the global economy and financial markets, monetary and fiscal policy, financial regulation and digital assets. He also has expansive network of policymakers and capital market players worldwide.

As Deputy Director-General of Monetary Affairs at the BoJ from 2015 to 2018, he was responsible for designing key monetary policy measures. He represented the central bank in policy coordination with major central banks such as the U.S. Federal Reserve and the European Central Bank. He managed policy communications with markets and frequently engaged in dialogues with major hedge funds and institutional investors globally. From 2010 to 2013, he served as Alternate Executive Director for Japan on the IMF Executive Board, where he helped address the European sovereign crisis. During the Global Financial Crisis from 2007 to 2010, he was a chief negotiator for the overhaul of financial regulations, including Basel III. Earlier, he was the Secretary to the Bank for International Settlements CPSS-IOSCO Task Force, setting global standards for capital market infrastructure.

He was a Professor of Economics at Hitotsubashi University's Graduate School of International and Public Policy from 2018 to 2021, and he is currently Specially Appointed Professor of Finance at Rikkyo University, Tokyo.

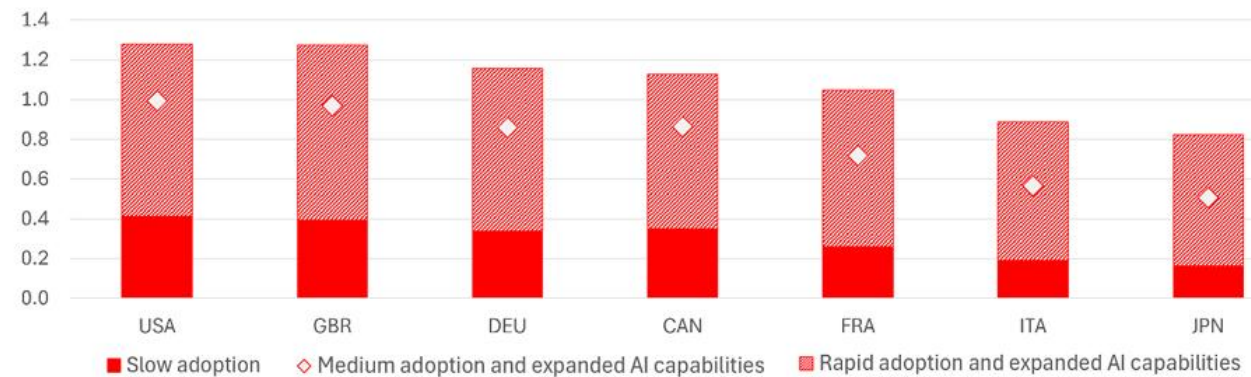
He holds a master's degree in economics and a bachelor's degree in law (LL.B.), both from the University of Tokyo. He also holds a Master of Technology in Innovation for Design and Engineering from the Advanced Institute of Industrial Technology, Tokyo.

Where does AI-driven economic growth come from? (1)

- Labor productivity

Task-based approach (Acemoglu): AI either substitutes for or complements specific tasks, enabling workers to generate more output with the same labor input

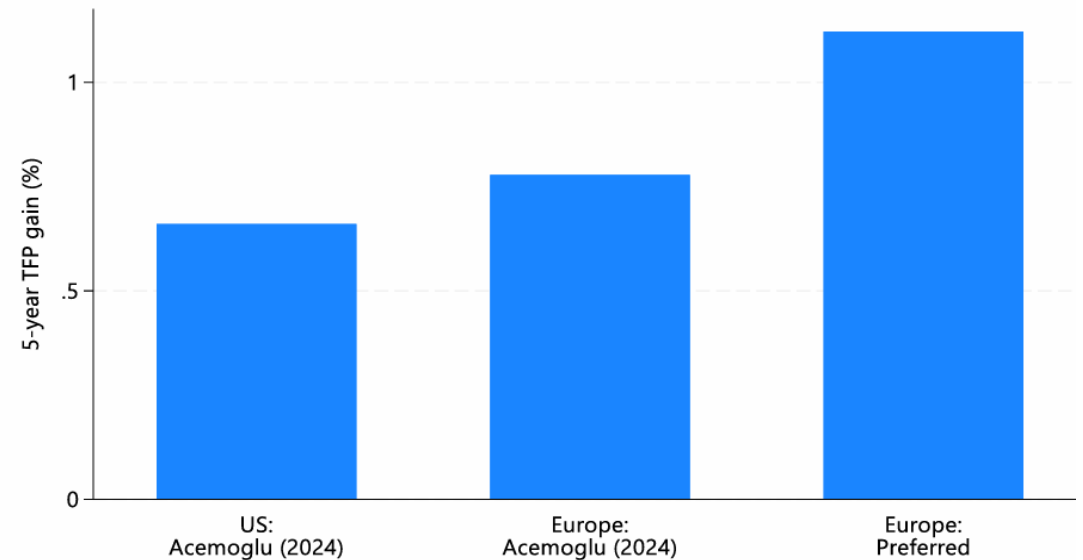
Predicted labor productivity growth due to AI over the next 10 years (percentage points, annualized)



(Source) Filippucci et al, *Macroeconomic productivity gains from Artificial Intelligence in G7 economies*, OECD (June 2025)

- TFP

AI as GPT (General Purpose Technology): AI changes how firms organize production and how decisions are made inside organizations beyond automation



Sources: Eurostat, EU LFS, EU SILC, and IMF staff calculations.

(Source) Misch et al, *Artificial Intelligence and Productivity in Europe*, IMF Working Paper (April 2025)

Where does AI-driven economic growth come from? (2)

- R&D productivity

AI as idea production function (Jones): more ideas are likely to increase the level of productivity substantially: if all research tasks are automated, a growth explosion is theoretically possible.

AI as generator of design, while humans generate ideas, promotes innovation (Agrawal et al.)

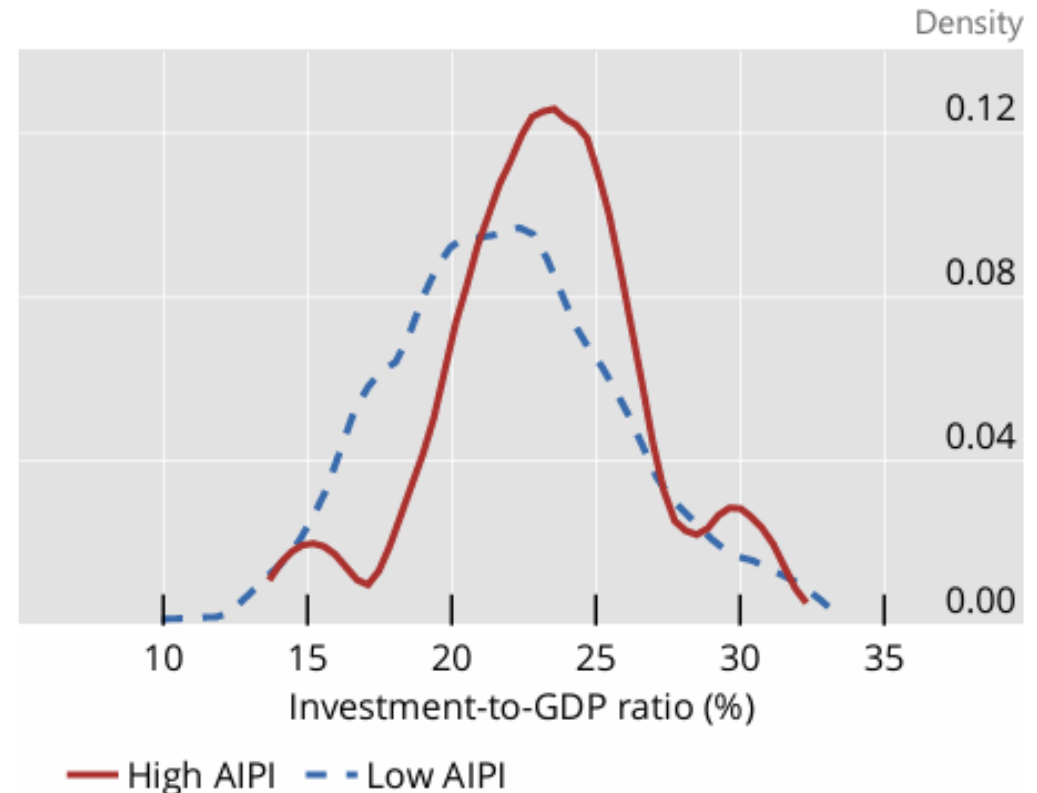
Viewed not only as a GPT but also as a technology that automates R&D, AI can be seen as an investment that expands the production possibility frontier and fundamentally broadens the set of economic opportunities available to society.



Logic Behind Optimistic AI Scenarios

- Capital deepening

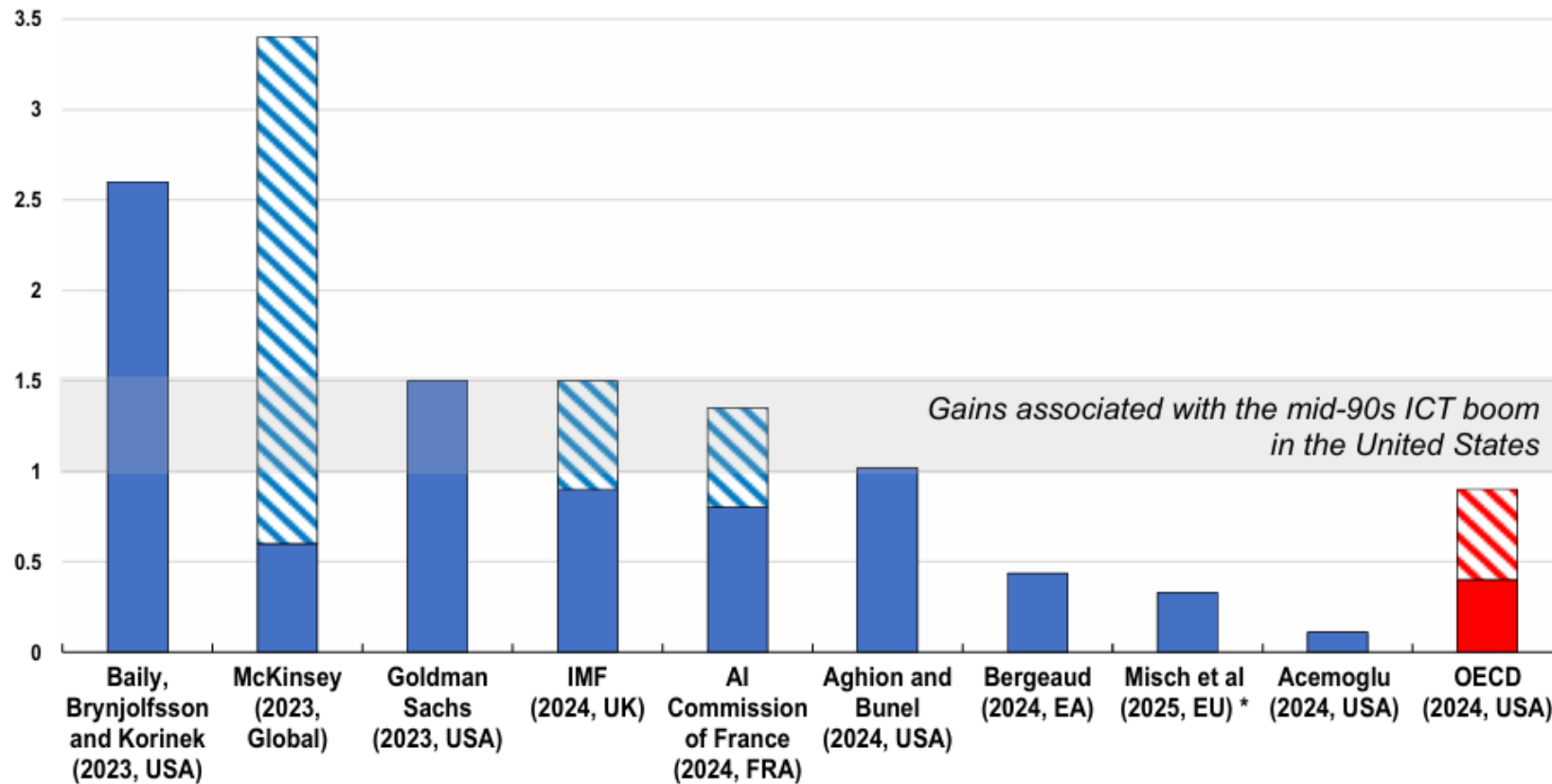
AI preparedness raises business investment and supports total investment at the low end of the distribution



(Source) BIS Bulletin, *AI and the global economy: implications for central banks* (July 2026)

Optimistic and cautious views coexist

AI's predicted macro-level productivity gains vary substantially across studies

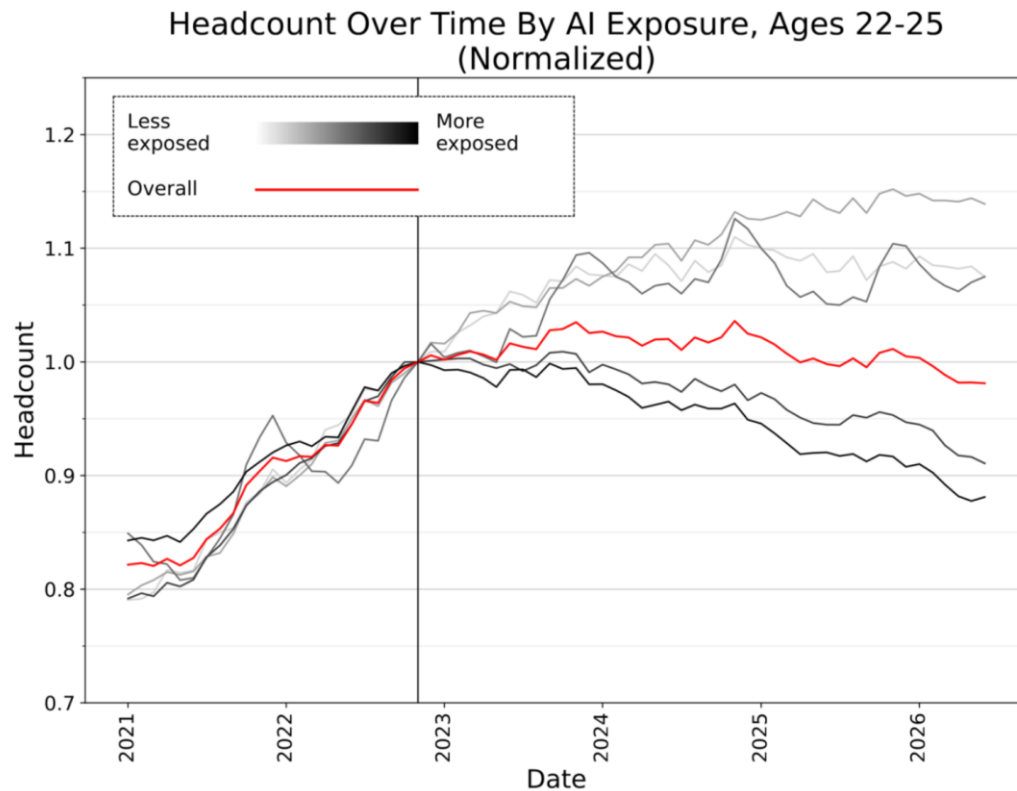


Predicted increase in annual labor productivity growth over a 10-year horizon due to AI, in percentage points. When the source presents a range of estimates as the main result, the lower and upper bounds are indicated by striped areas.

(Source) Filippucci et al, *Macroeconomic productivity gains from Artificial Intelligence in G7 economies*, OECD (June 2025)

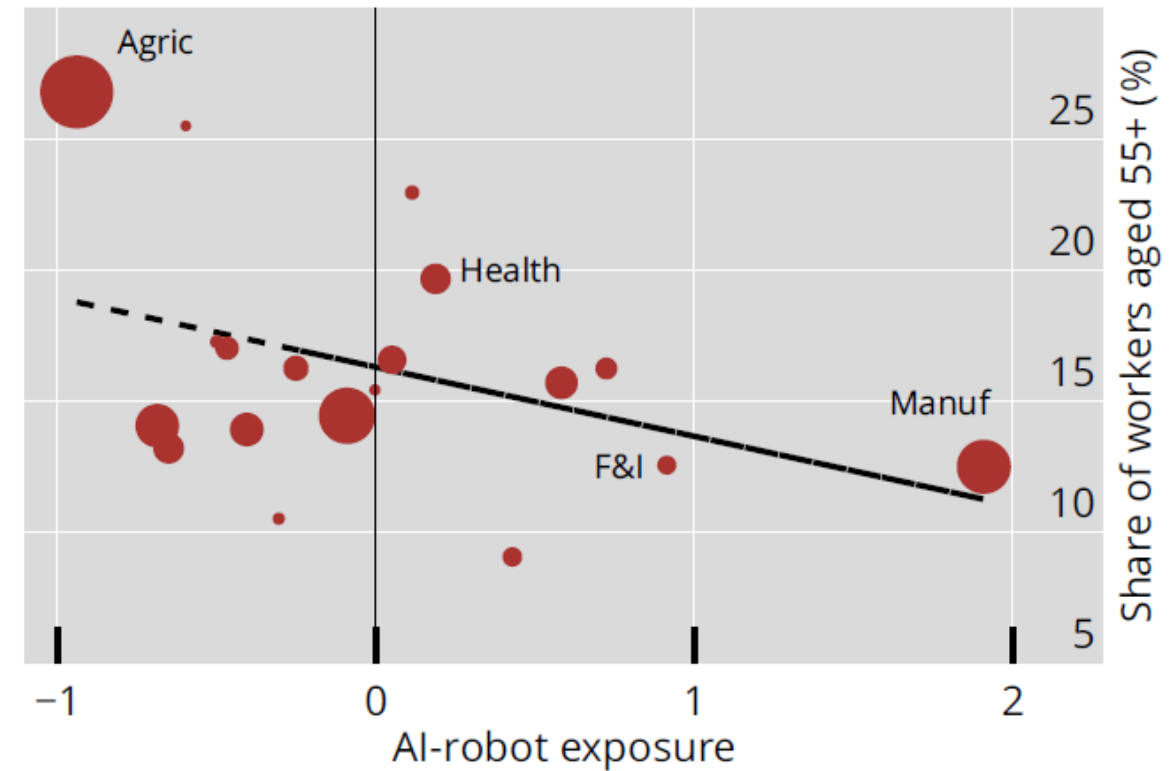
AI-driven labor substitution and structural changes

AI Employment Gap for Young Workers Has Widened to 19%



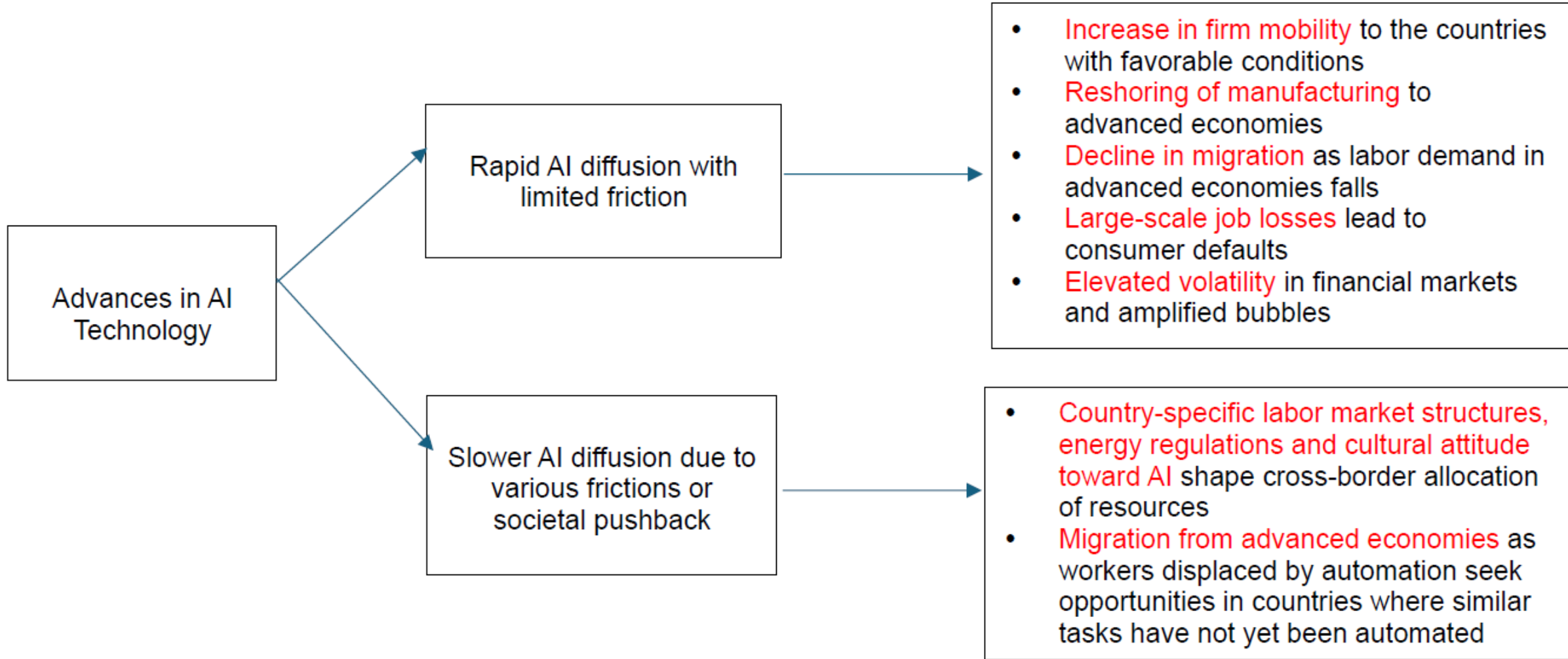
(Source) Brynjolfsson et al, *Canaries in the Coal Mine? Six Facts About the Recent Employment Effects of Artificial Intelligence: Revised* (August 2026)

Countries facing severe labor shortages due to aging populations would benefit greatly from automation, but workforces are older mainly in the industries where automation helps the least



(Source) BIS Bulletin, *Old workers, young machines: can AI and automation offset population ageing?* (September 2026)

AI raises growth but also inequality



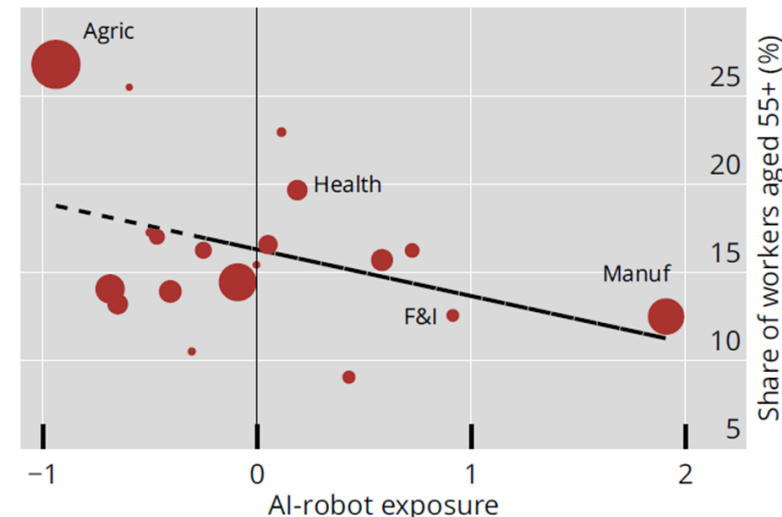
(Source) Author's categorization based on Barhoumi et al., *Global Economic and Financial Implications of Artificial Intelligence: Lessons from a Scenario Planning Exercise*, IMF Notes (April 2026)

AI Providers vs AI Consumers

- A new dimension of economic divergence
 - AI Service Providers (US and China)
 - AI Service Consumers (Japan, Korea, Europe, EMs)
- The distribution of AI-related income may matter as much as AI adoption itself
 - Race to the Top: Countries capable of providing AI services may enjoy substantial monopoly rents and winner-takes-most outcomes.
 - The economic benefits of AI data-center construction are largely temporary. Consumers bear the ongoing costs of electricity, energy, and water resources, while the recurring profits from AI services accrue primarily to AI service providers.
 - Race to the Bottom: To remain competitive in an economy reshaped by AI-driven resource reallocation, governments may face pressure to loosen regulations, subsidize AI providers, and lower operating costs.
 - Will AI-consuming countries eventually be forced to tax AI services or compute usage in order to finance redistribution mechanisms such as Universal Basic Income?
- Current account balances will increasingly reflect AI income flows rather than goods-and-services trade

Physical AI and Future Manufacturing Competitiveness

- Current AI-exposure measures may underestimate manufacturing economies like Korea, Japan and Germany
- If AI becomes increasingly integrated with robotics, industrial production, and logistics systems, future productivity gains in manufacturing, infrastructure and agriculture may extend well beyond knowledge work
- Competitive advantage will depend not only on digital capabilities but also on the ability to combine AI with manufacturing know-how, industrial automation, energy systems, and physical infrastructure
- For countries such as Japan and Korea, where population ageing is accelerating and the manufacturing workforce also gets older, AI may simultaneously enhance productivity and help address demographic constraints.



(Source) BIS Bulletin, *Old workers, young machines: can AI and automation offset population ageing?* (September 2026)

AI-driven Reconfiguration of Trade and Capital Flows

- If the hypothesis that “AI diffusion determines economic growth” is correct, both international trade patterns and global capital flows are likely to be reorganized according to differences in the speed of AI adoption.
 - More cautious views emphasize the existence of “weak-link constraints,” arguing that human capabilities may not adapt quickly enough to fully exploit AI-driven productivity gains.
- Interesting hypotheses by IMF(2026)
 - Reshoring of manufacturing to advanced economies
 - Migration from advanced economies to countries with slower AI adoption
- A Potential Reconfiguration of Global Specialization
 - If manufacturing activity is reshored to advanced economies and national economies become more self-contained, global trade volumes may decline. Developing countries could face significant challenges, and traditional notions of comparative advantage may require substantial redefinition.

Monetary Policy and Financial Stability

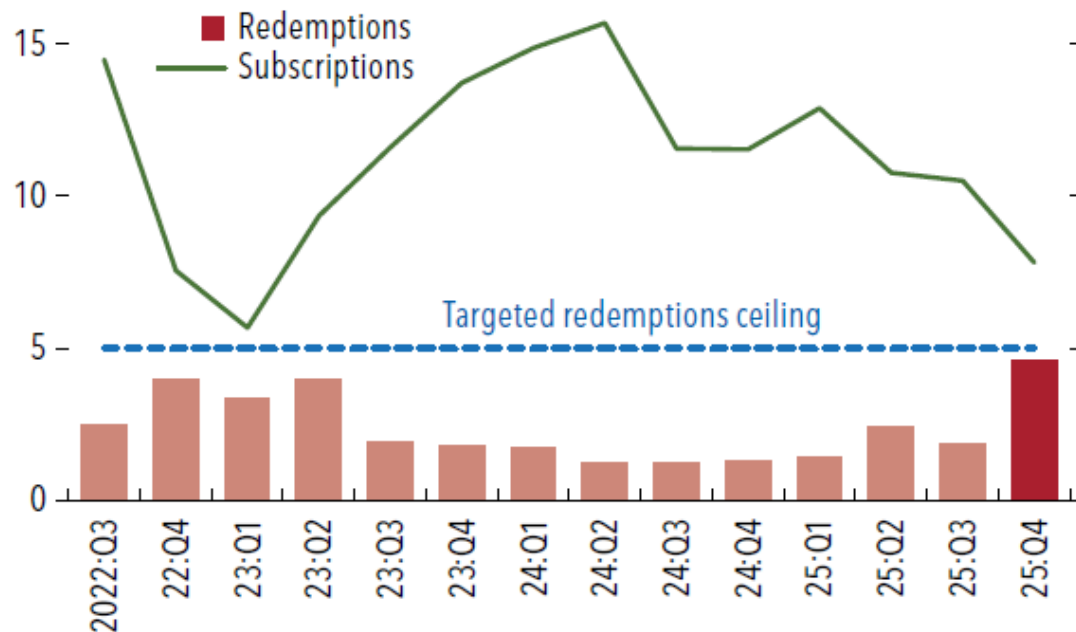
- In the short run, sustainability of large-scale investments in AI and its data centers needs scrutiny.
- Over the longer term, uncertainty surrounding monetary policy and financial stability is likely to increase, particularly during the transition phase of AI diffusion.
- Monetary Policy
 - ✓ Output gap - AI investments and productivity growth, unemployment
 - ✓ Neutral rate - Review along with productivity growth
 - ✓ Financial conditions - Elevated volatility and amplified bubbles
- Financial Stability
 - ✓ Transformation of financial services (lending, asset management, insurance)
 - ✓ Over-optimistic expectations of AI-driven productivity gains
 - ✓ Widening gap in profitability among financial institutions
 - ✓ Volatility arising from reduced predictability in monetary policy

Short-run Risk 1 : Weakening Investor Discipline

- Technology booms often attract capital faster than productivity materializes

Redemption requests at non-traded BDCs are nearing cap levels, while new capital inflows are losing momentum

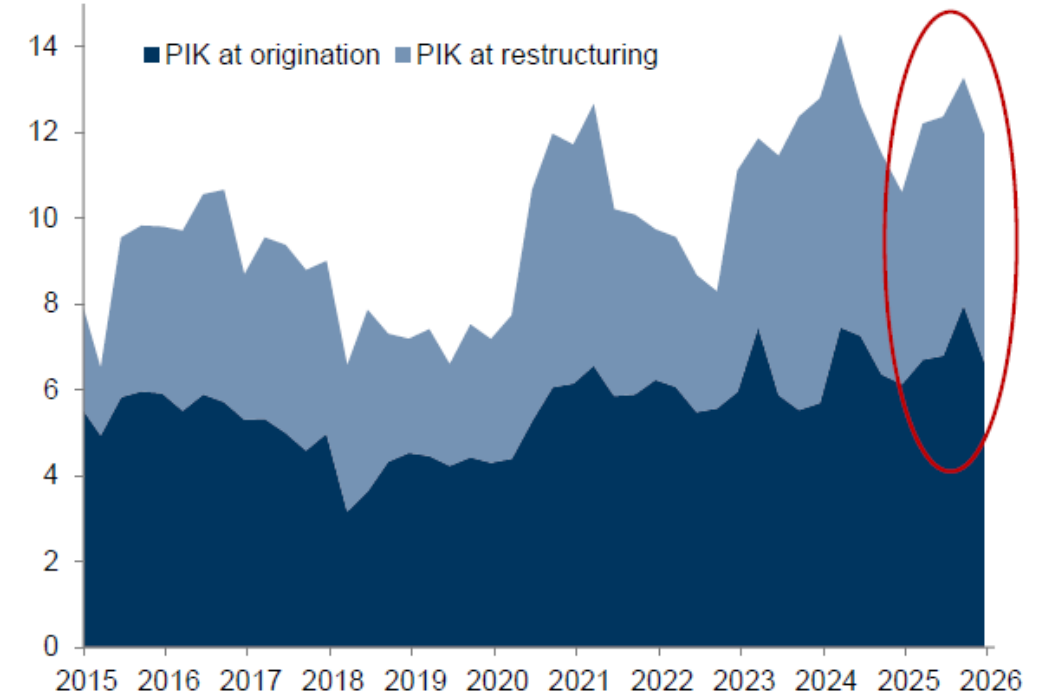
3. Quarterly Redemptions for Perpetual Nontraded Business Development Companies
(Percentage of outstanding shares)



(Source) Global Financial Stability Report, IMF (April 2026)

Increase in PIK (Payment-In-Kind) at origination suggests weakening investor discipline

Share of PIK by fair value, %



Note: Includes first- and second-lien loans in BDC portfolios. Captures data through December 31, 2025.

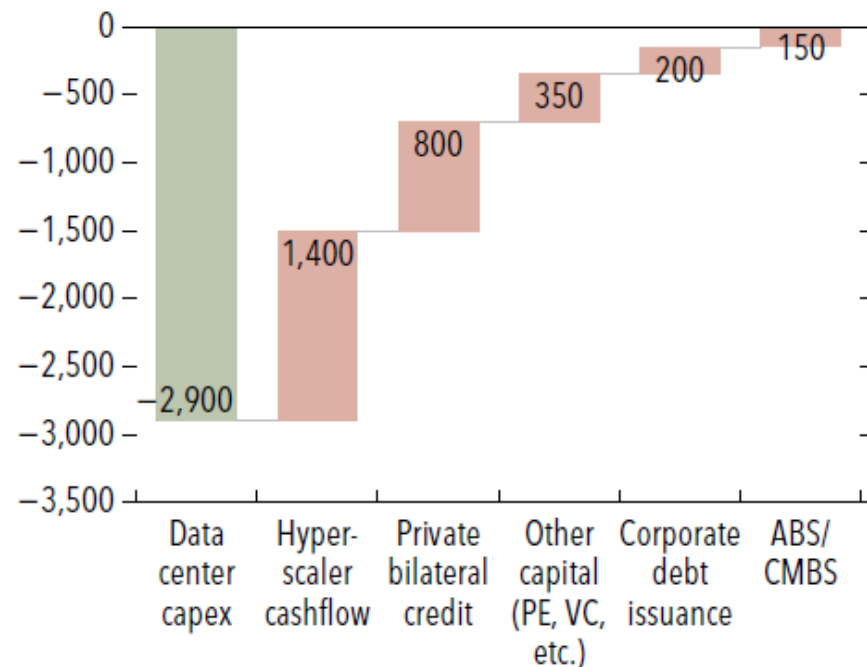
(Source) Goldman Sachs Research "Top of Mind" Issue 148 (April 2026)

Short-run Risk 2: Accelerating Obsolescence

- Rapid innovation may shorten asset lives and increase refinancing risks

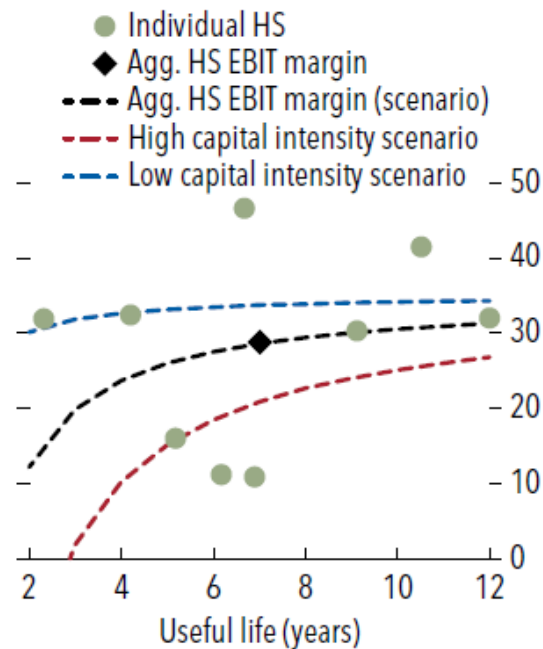
The rapid expansion of data-center investment is increasing dependence on external sources of funding

1. Data Center Capital Expenditure through 2028
(Billions of dollars)



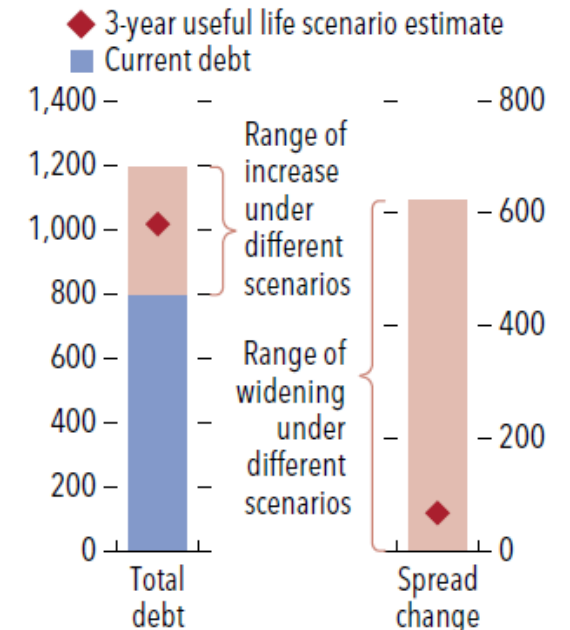
Hyperscalers generally assume an average useful life of approximately seven years, but...

2. Hyperscalers' Profit Margins under Selected Obsolescence Risk Scenarios
(Percent, EBIT margin, y-axis; years, useful life, x-axis)



A shortening of asset lives to three years could trigger further fundraising requirements and upward pressure on funding costs.

3. Hyperscalers' Debt Outstanding and Modeled Spread Changes
(Billions of dollars, left scale; basis points, debt-weighted average spread change, right scale)



(Source) Global Financial Stability Report, IMF (April 2026)

Could AI Trigger a Financial Crisis?

- History suggests that technological revolutions rarely trigger financial crises directly; crises emerge when expectations outrun reality.

Comparison with the Global Financial Crisis (GFC) of 2007–09

(Similarities)

- Expansion of shadow banking activities, particularly through private credit markets
- Opacity regarding the ultimate location of risk, accompanied by the growing use of risk-transfer instruments
- Emerging signs of weaker lending standards, including expanding partnerships between banks and private-credit asset managers, as well as increasing use of PIK structures from loan origination.
- Growing interconnectedness with banks, insurers, and other financial institutions
- A period of exuberance and overconfidence driven by a dominant investment narrative: subprime mortgages then, AI investment now

(Differences)

- While the outstanding volume of private credit is comparable to that of the subprime market before the GFC, it remains relatively modest relative to the size of the overall economy.
- Listed Business Development Companies (BDCs) may serve as market “canaries,” offering earlier signals of deterioration than were available during the pre-GFC period.

Future Finance and AI

- Risks mitigated by AI
 - ✓ Reduction in operational risk through process automation
 - ✓ Sophistication in risk management
 - ✓ Fraud detection
 - ✓ AML/CTF
- Risks brought by AI
 - ✓ Diverging productivity levels and competitive frontiers arising from differences in AI adoption
 - ✓ More sophisticated cyber threats and attack capabilities
 - ✓ The combination of AI and tokenization (“on-chain finance”) may fundamentally disrupt traditional financial intermediation.
 - ✓ As AI-driven decision-making becomes increasingly standardized, trading activities may become more susceptible to herding behavior and associated market volatility.
 - ✓ Changing competitive dynamics may accelerate consolidation within the financial sector and increase concentration risk.

Takeaways

- The literature identifies four principal channels through which AI may support economic growth: 1) labor productivity, 2) total factor productivity (TFP), 3) R&D productivity, and 4) capital deepening. However, **views remain sharply divided regarding the magnitude of these productivity gains.**
- AI-driven labor substitution is already becoming visible, particularly in industries with high exposure to AI. However, sectors facing the most severe demographic challenges, such as agriculture and parts of manufacturing, often exhibit relatively low AI exposure, creating **a gap between the benefits of AI and demographic needs.**
- **Task-based approaches may underestimate the productivity potential of sectors such as manufacturing, infrastructure, healthcare, and agriculture.** For manufacturing-oriented economies including Japan, Korea, and Germany, Physical AI may become a key determinant of long-term competitiveness.
- AI is likely to raise economic growth while also widening **inequality, particularly between countries that provide AI services and those that primarily consume them.**
- **Rising productivity differentials across countries are likely to reshape both international trade and capital flows.** If AI encourages the reshoring of manufacturing to advanced economies, developing countries may face growing challenges and traditional concepts of comparative advantage may require reconsideration.
- AI will not only automate operations and enhance risk management but may also **disrupt traditional finance through its interaction with tokenization.** Productivity gaps among financial institutions are likely to widen, while AI-driven standardization may increase **herding behavior, market volatility, and concentration risk.**