Digital Trade and AI

New Opportunities and Risks for Growth, Trade, and Investment

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2026 Asian Think Tank Network Forum

Singapore, 8 October 2026

ADB

Economic opportunities and risks of digital technology and AI

Opportunities

- Improved access and quality of information and public services (education, health care, finance etc)
- New business models; new products, services and tasks
- Enhanced productivity; efficient production and innovation
- Better monitoring, analytics, and decisions; greater resilience to shocks

Challenges

- Digital divides (in terms of access, use, and outcome): widened gap; uneven or concentrated gains
- Job market disruption: automate some tasks, increase skill premia
- Governance and security: data misuse, model and algorithm bias, misinformation, cyber attacks
- Sustainability challenges: increase physical and digital infrastructure needs; environmental impacts depend on how AI is developed and used

Source: ADB, 2025. Asian Development Policy Report: Harnessing Digital Transformation for Good.

Growth and productivity: AI can boost growth, but realizing wider productivity gains requires more than technology spendings

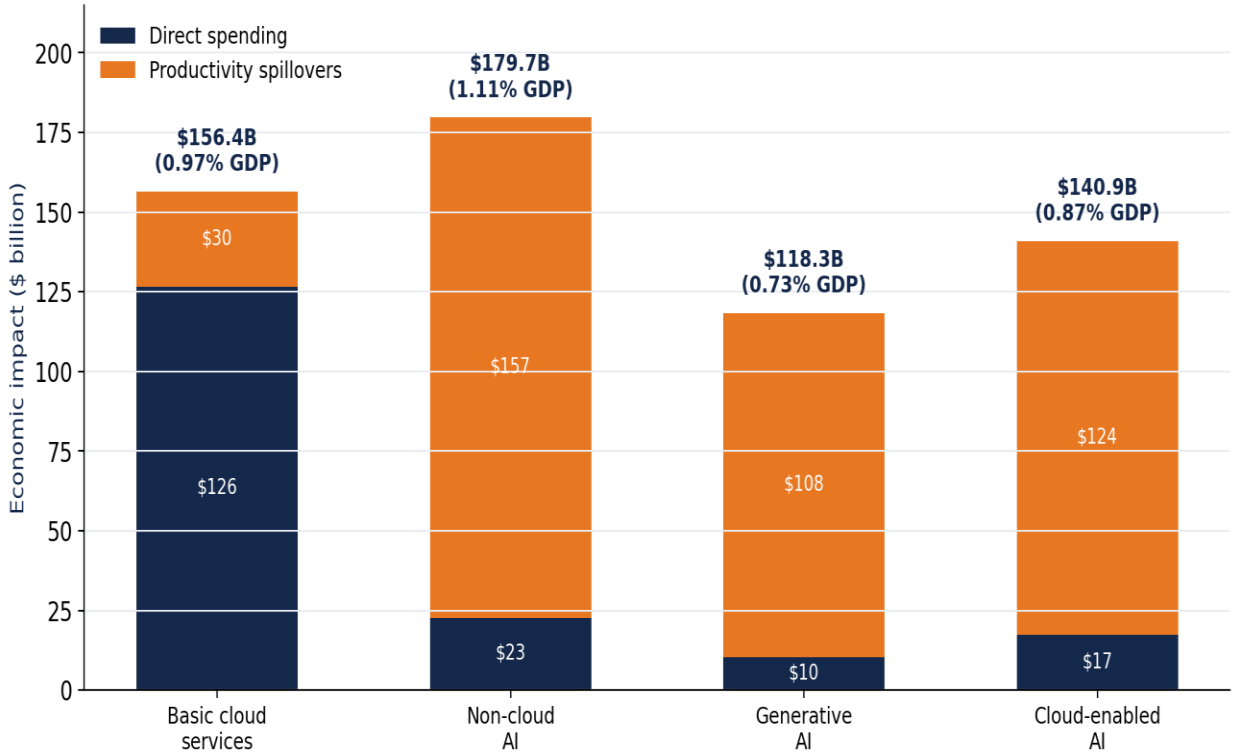
Summary of findings

- AI's economic contribution extends beyond technology spending. Productivity spillovers account for much of the estimated economic contribution.
- Wider gains depend on complementary investments in infrastructure investments and skills, broad adoption across firms and sectors, supported by an effective innovation ecosystem.

Source:
ADB 2026 forthcoming: **AI for Asia's Growth and Development**

Chapter 2: Leveraging Artificial Intelligence and Cloud Computing to Accelerate Growth in Asia and the Pacific
Chapter 6: The Role of Artificial Intelligence in the People's Republic of China's High-Quality Development

Total Economic Impact of Artificial Intelligence and Cloud Computing, by Category, 2025

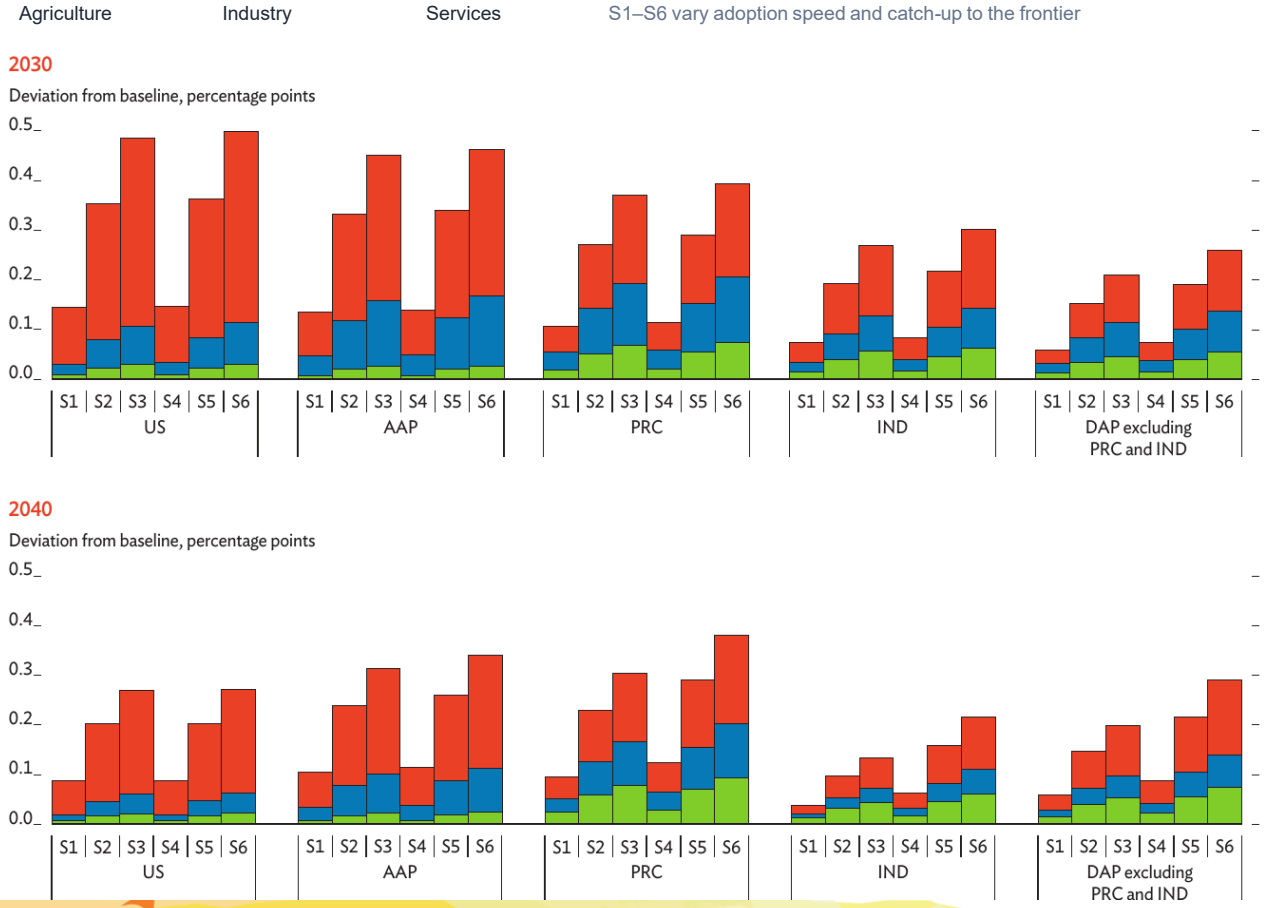


Notes: This figure includes Australia, India, Indonesia, Japan, the Republic of Korea, Malaysia, New Zealand, the Philippines, Singapore, Thailand, and Viet Nam. The People's Republic of China is excluded because its scale (38% of the region's cloud market and 61% of the AI market) would distort the aggregate. Spillovers were the dominant source of value.

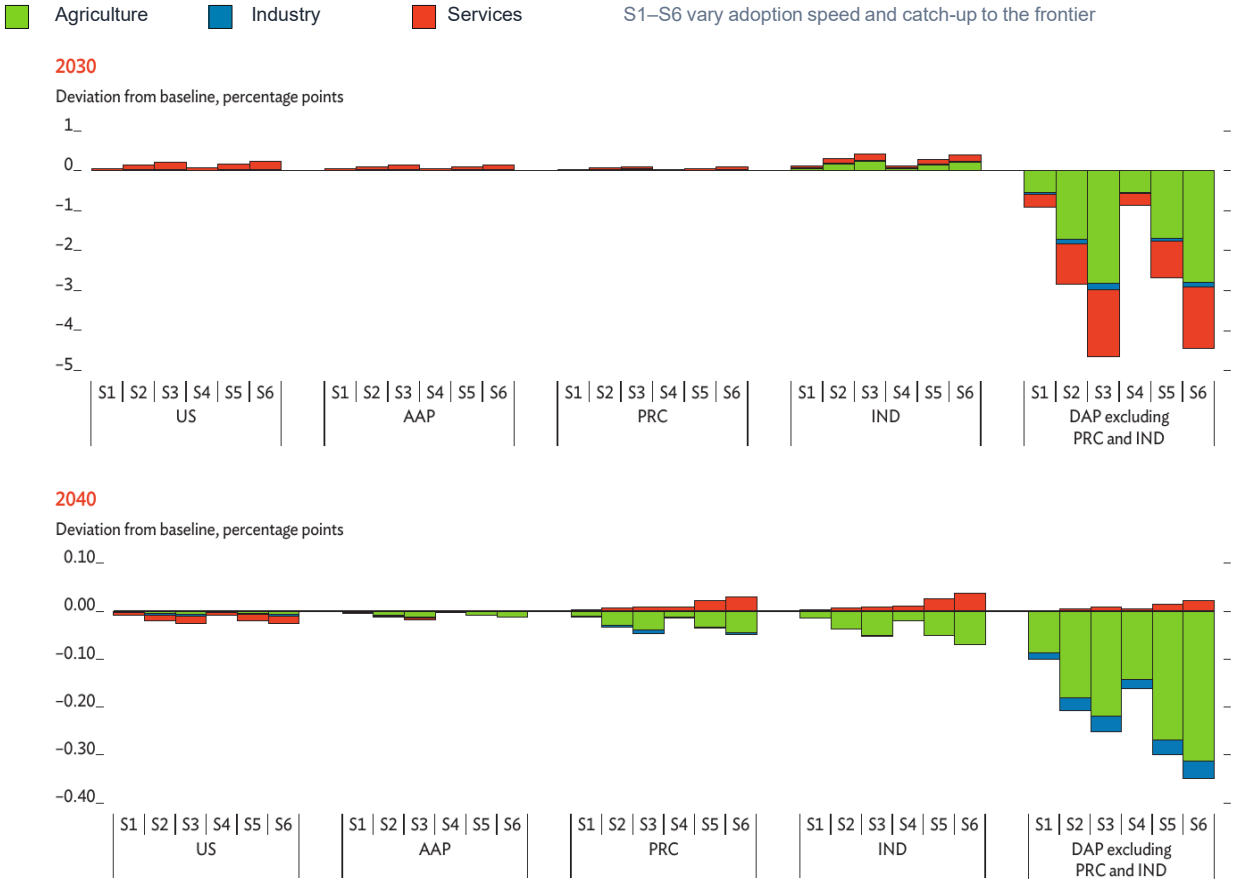
Sources: International Data Corporation (IDC). Worldwide AI and Generative AI Spending Guide. Feb (V1 2025) database (accessed 30 July 2026); International Data Corporation (IDC). Worldwide Software and Public Cloud Services Spending Guide. Jul (V2 20-24) database. (accessed 30 July 2026); Telecom Advisory Services.

Macro evidence: AI' output and job gains in developing Asia and Pacific

AI's output gains are sectoral, led by services



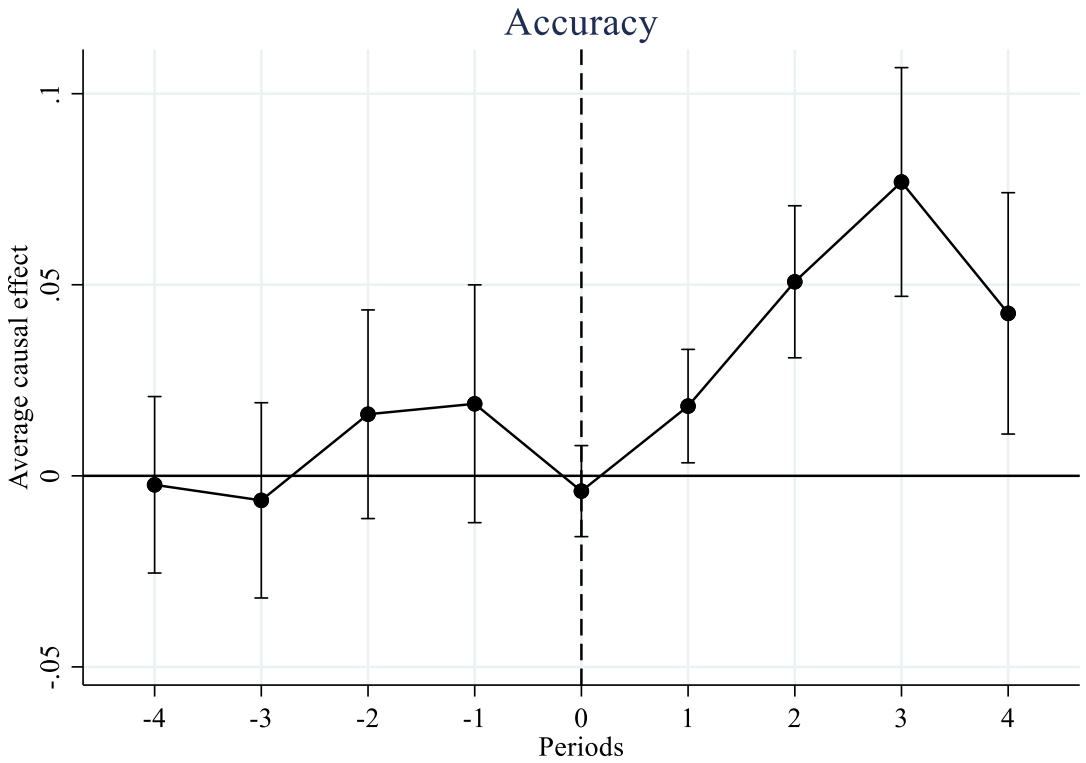
AI does not form a uniform job shock



Source: Asian Development Outlook April 2026

Some micro evidence: uneven AI Gains — individuals with greater capacity and resources have greater productivity gains

Using data of financial analysts in the PRC, evidence shows that analysts' productivity (measured by earnings forecast accuracy) improves significantly after a city becomes an AI pilot (stronger efforts on AI adoption and adaptation), and in brokerage houses with greater AI adoption strategy and investments.



Analysts' productivity gains from house's AI adoption is larger among analysts with greater capacities (higher education, stronger professional experience and record) and resources (affiliated with larger brokerage houses.)

	Accuracy	Accuracy	Accuracy	Accuracy
HighEdu×AI_Adoption	0.150**			
	(1.961)			
HighExp×AI_Adoption		0.051**		
		(2.229)		
Star×AI_Adoption			0.086**	
			(2.206)	
BigBroker×AI_Adoption				0.129***
				(3.148)
AI_Adoption	-0.086	0.028	0.015	0.001
	(-1.132)	(1.060)	(0.548)	(0.041)
HighEdu	-0.001			
	(-0.093)			
HighExp		0.015***		
		(3.505)		
Star			-0.027***	
			(-3.019)	
BigBroker				-0.009
				(-0.649)
Control variables	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Analyst FE	Yes	Yes	Yes	Yes
Observations	130,799	139,282	139,282	139,282
Adjusted R-squared	0.199	0.211	0.210	0.210

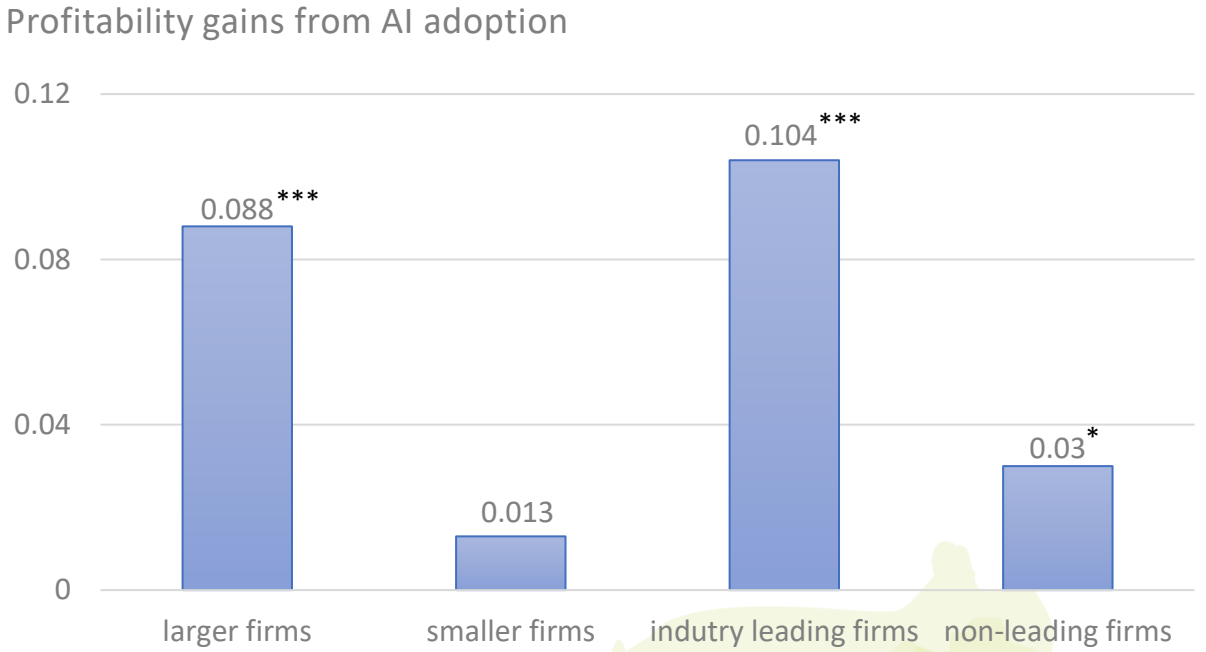
Source: Lin, S., Tian, S., and Zhang, R. (2026). Analysts' AI adoption and earnings forecast accuracy. Working paper

Some micro evidence: uneven AI Gains—large and industry leading firms have greater profitability gains from AI adoption

PRC public listed firms' AI strategy and adoption (based on text analysis of Management Discussion and Analysis) is significantly and positively related to firm profitability (undistributed profit per share)

	Profitability	AI adoption First-Stage Regression	Profitability Second-Stage Regression	Profitability PSM-DID
IV		0.001***		
		(17.45)		
AI adoption	0.071***		0.286**	
	(4.17)		(2.34)	
AI pilot*Post				0.192***
				(4.28)
Controls	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	41554	41,484	41,484	34,146
R-squared	0.783	0.813		0.795

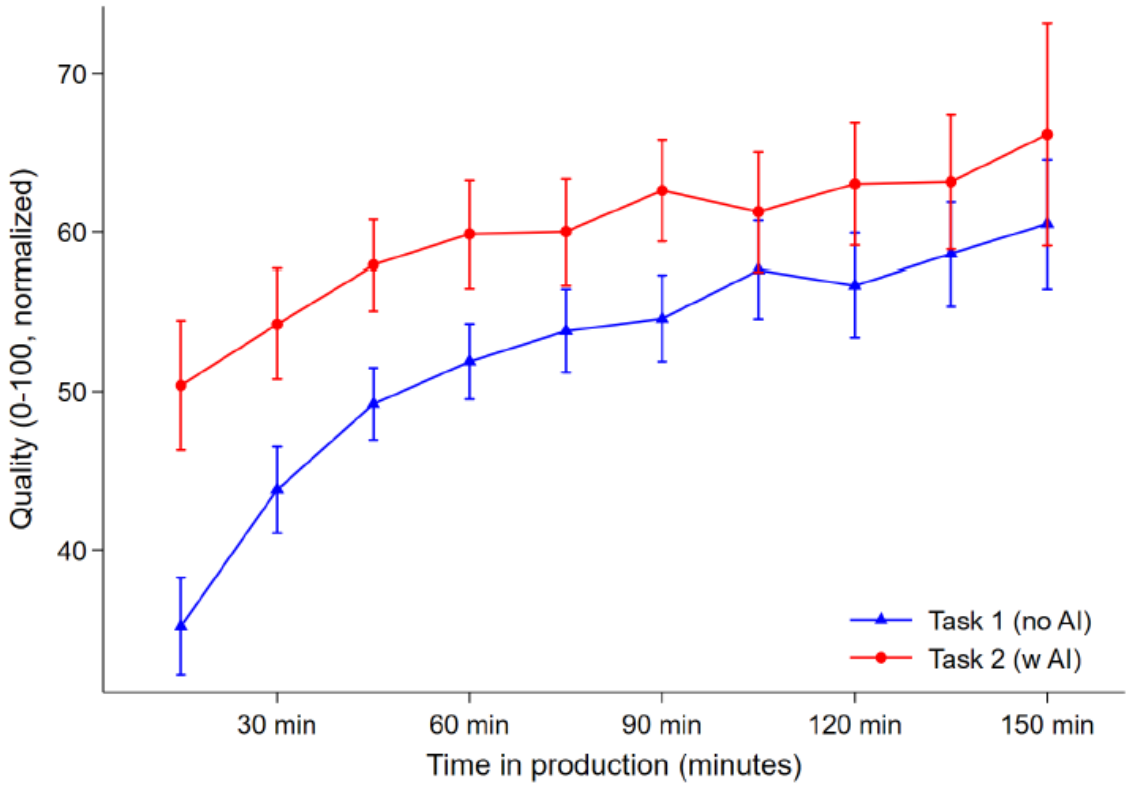
Firms' AI related profitability gains pass through from greater TFPs and innovation activities. But the gains are significantly larger among big firms and industry leading firms.



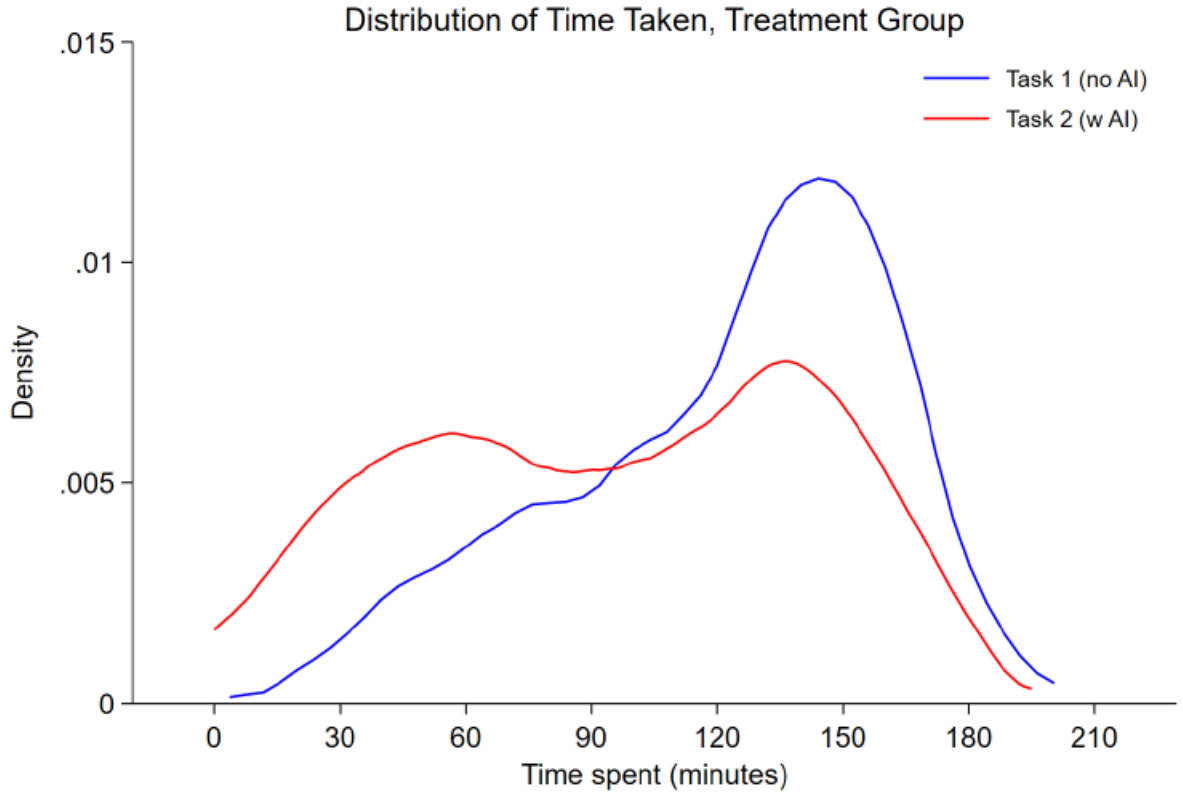
Source: Lin, S., Tian, S., and Wen, H. (2026). Impact of AI Adoption on Corporate Profitability

Some micro evidence: AI adoption may increase individuals' productivity but does not necessarily translate into higher output

Using AI brings higher productivity, but doesn't necessarily increase output



AI group shows twin peak: using AI tools, some art workers spend the same amount of time and produce more, while others spend much less time and produce almost the same



Source: Chen et. al. (2026), Better Technology, Worse Motivation: GenAI's Mediocrity Trap

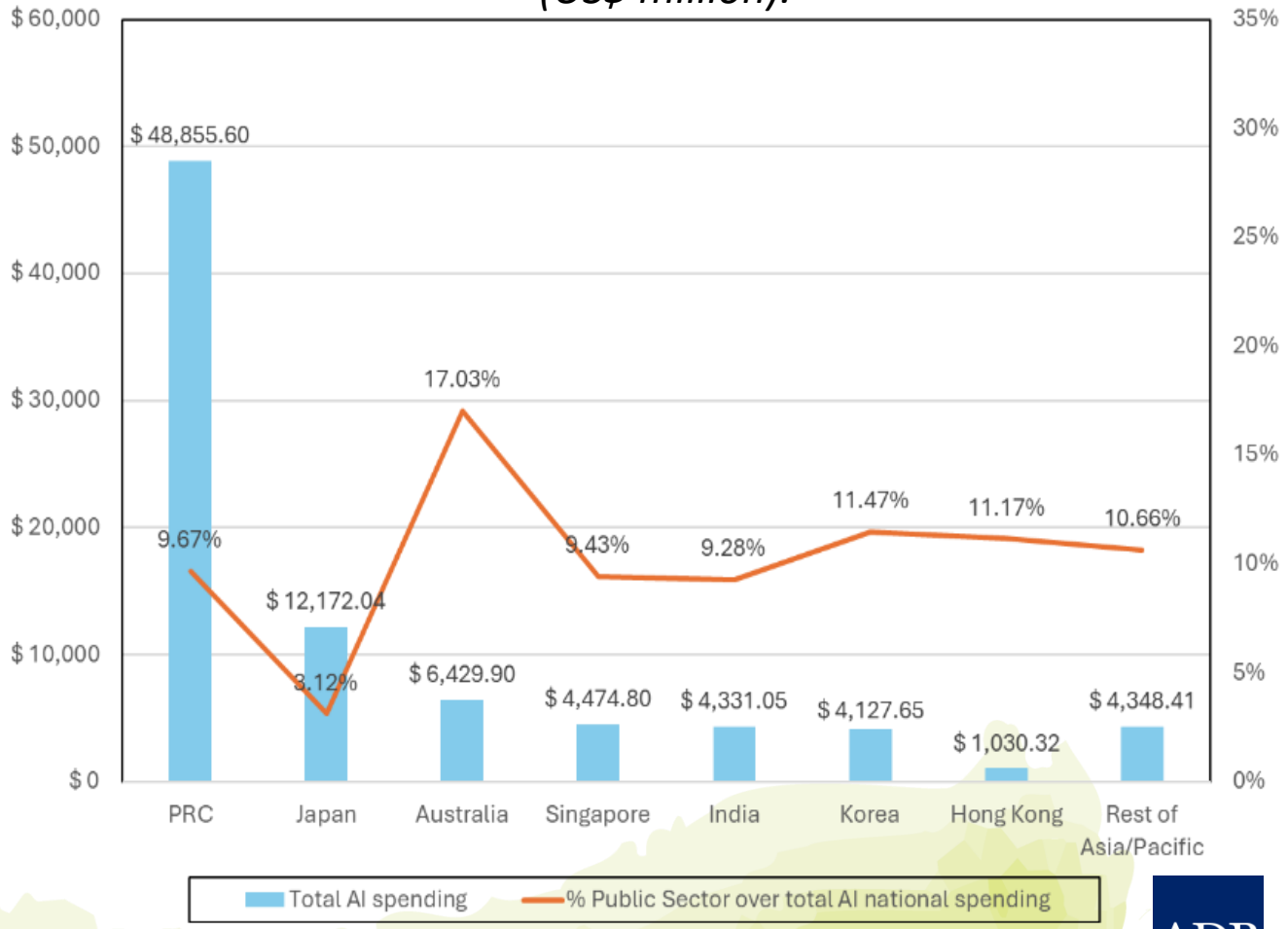
Public services: AI can improve public services and strengthen the targeting of support

Summary of findings

- AI and cloud computing can strengthen government capacity and improve government operations by supporting policymaking and internal administration and delivering services more efficiently.
- AI-based tools like poverty mapping can fill information gaps and help identify underserved communities, guide resource allocation, and support inclusion
- Policy implication: Build foundations including digital infrastructure, usable and quality data, user capacity and human oversight, and responsible governance

Source: ADB 2026 forthcoming: **AI for Asia's Growth and Development**
Chapter 3: Leveraging Artificial Intelligence and Cloud Computing to Improve Public Sector Efficiency in Asia and the Pacific
Chapter 9: Artificial Intelligence and Poverty Mapping

Public sector AI spending in Asia and Pacific by economy (2025) (US$ million).



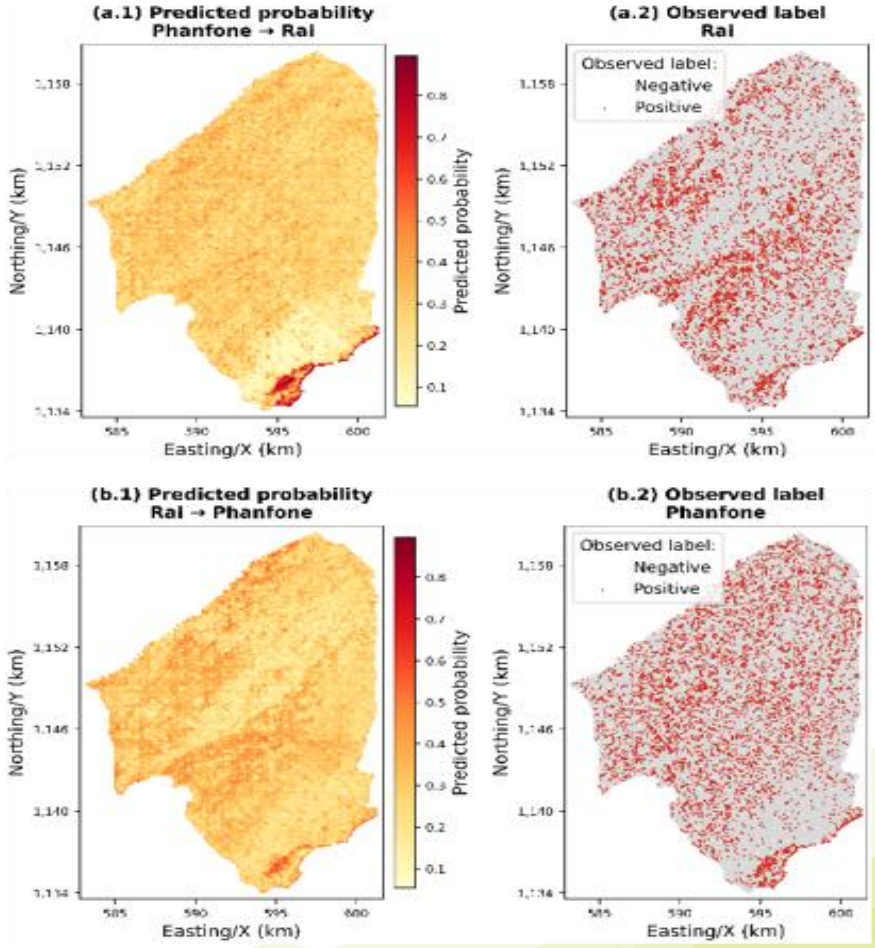
Source: IDC Worldwide Software and Public Cloud Services Spending Guide, Jul (V2 2024) Forecast

Shock readiness and resilience: AI-enabled risk mapping can support local disaster preparedness and resilience

Summary of findings

- AI can combine fragmented geospatial data to identify priority areas for preparedness, infrastructure inspection, and post-disaster assessment—provided the maps are validated with local knowledge and field evidence.
  - Turn available data into local risk information
  - Consider local conditions alongside shock/disaster intensity
  - Use risk maps to prioritize preparedness

Predicted Disturbance Probability and Observed Synthetic Aperture Radar Disturbance (SAR) Labels from Random Forest Model



Notes: "Rai" and "Phanfone" refer to typhoons Rai (2021) and Phanfone (2019) in the Philippines. The arrows between the typhoon names indicate the direction from the typhoon on which the model trained to the typhoon on which it was tested. The units of analysis in the maps are 100-meter grid cells. The values along the northing/Y axis represent north–south projected coordinates in meters, and the values along the easting/X axis represent east–west projected coordinates in meters.

Source: ADB 2026 forthcoming: **AI for Asia's Growth and Development** *Chapter 7: Machine-Learning-Enabled Typhoon Risk Mapping for Local Disaster Preparedness: A Case Study from Cebu City, Philippines*

Regulation and governance: Common Governance Principles and Regulatory Experimentation enable Responsible AI

Summary of findings

- **Shared principles establish trust:**
  - ASEAN's AI governance principles broadly align with global frameworks, in terms of transparency, fairness, accountability, safety, privacy, and human oversight.
  - Economy specific differences in regulatory capacity and digital readiness create uneven implementation.
  - Regional capacity building and interoperable frameworks are essential to support responsible AI adoption and reduce regulatory fragmentation.
- **Supervised experimentation can support innovation and better regulation:**
  - Regulatory sandboxes allow controlled testing under supervision, helping navigate regulatory uncertainty while enabling learning about emerging technologies.
  - Sandbox design shall fit local capacity and objectives, requiring technical expertise, safeguards, clear responsibilities, and coordination.

Source: ADB 2026 forthcoming: **AI for Asia's Growth and Development**
Chapter 4: The Artificial-Intelligence Governance Landscape of the Association of Southeast Asian Nations: Global Alignments and Regional Dynamics
Chapter 5: Role of Artificial Intelligence in Asia's Growth and Development: Regulatory Sandboxes as a Tool for AI Governance in Asia

Comparative Mapping of the Association of Southeast Asian Nations and Global Artificial-Intelligence Governance Principles

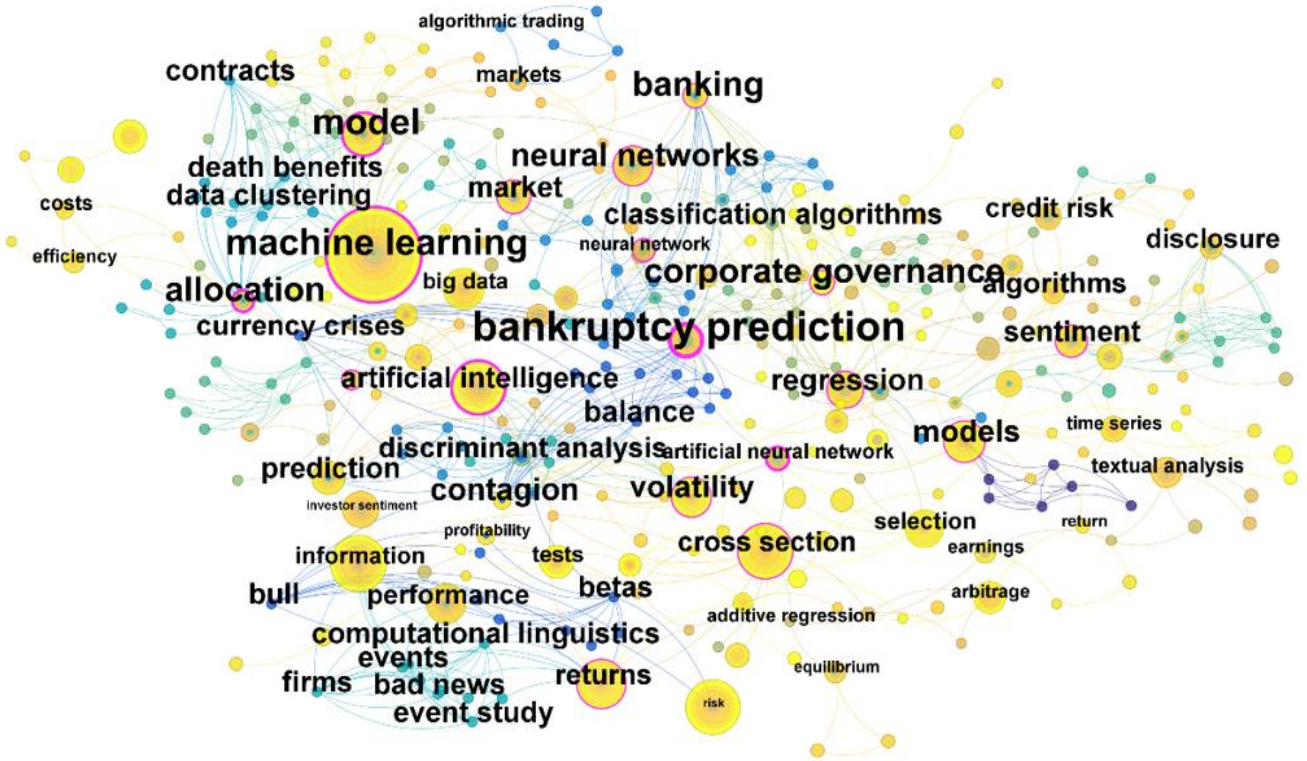
Key Element	ASEAN	OECD	UNESCO	UNGA	APEC
Human oversight	Core principle	Implied in Principle 5	Strong emphasis on human oversight and determination	Explicitly promoted	Highlighted in recent briefs
Privacy and data governance	Core principle	Embedded in the principle of trust	Strong emphasis on privacy and data protection	Included as a core governance value (or simply as a core principle)	Focused on data governance
Inclusivity and sustainable development	Framed through AI for the public good and digital inclusion	Promoted via growth and well-being pillar	Central focus on LMICs, inclusive development, and equity	Linked to 2030 Agenda	Emphasized through a development-oriented lens
Risk-based approach and risk management	Emphasized in the Expanded ASEAN Guide on AI Governance and Ethics—Generative AI	Risk management emphasized in the 2024 update of the "Principles on Artificial Intelligence"	Framed in terms of proportionality and do-no-harm principles	Risk-based governance highlighted as part of AI life-cycle governance	Promoted as pragmatic, but not in a prescriptive manner
Innovation and enabling environment	Embedded throughout (balanced with trust and responsible governance)	Strongly emphasized (alongside trust as a complementary goal)	Encouraged within ethical and human-rights frameworks	Supported, but balance with rights-based safeguards	Enabling environment included as a core principle
International cooperation and interoperability	Key ASEAN purpose (interoperability explicitly stressed)	Explicit in policy recommendations	Promoted via multistakeholder and global-cooperation frameworks	International cooperation emphasized	Core governance mode through voluntary, consensus-based cooperation

Financial market and financial stability: Greater Efficiency and Inclusion opportunities, with new Financial Stability Risks

Summary of findings

- AI improves market efficiency (via return forecasting, portfolio allocation, credit assessment, fraud detection, and corporate disclosure analysis etc) and can broaden financial inclusion, although the gains depend on data quality and fairness.
- Better risk management at institutional levels does not automatically improve system-wide stability (similar models and shared technology can synchronize trading and investment decisions, causing over-reaction and amplifying market volatility).
- There are also cybersecurity risks associated with cyber attacks, especially where cybersecurity investment and capacity is weak.
- Policy should combine innovation with stronger oversight and governance.

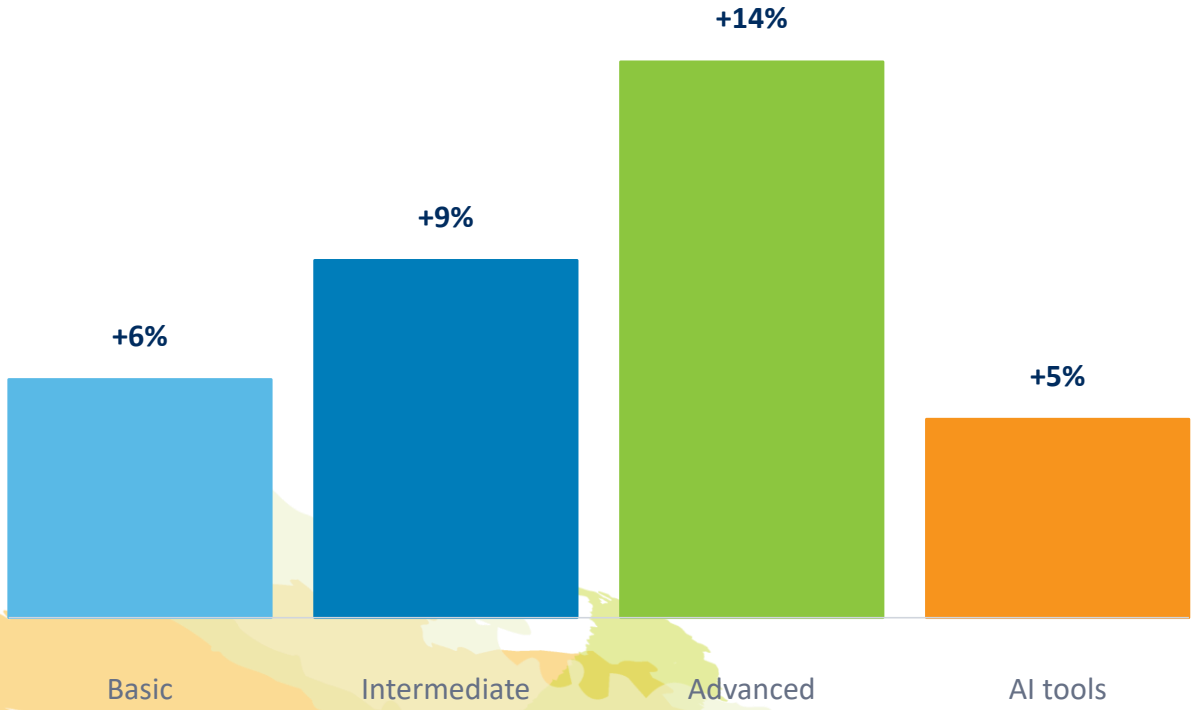
Key Word Clustering Map in Financial Sector



ADB 2026 forthcoming: **AI for Asia's Growth and Development**
Chapter 8: The Role of Artificial Intelligence in Finance: A Selective Literature Review and Discussion of Implications for Asia's Financial Stability

Job market and skills: Uneven digital and AI exposures on workers, labor demand, and wages, varying with development stages & skills.

Higher digital skills are associated with higher wage premium.



Source: Adrjan, P., Aoki, Y., Ciminelli, G., Döttling, R., and Garcia-Mandicó, S. (2026). Skills That Pay: Digital Skills Demand and Wage Premia in Asia and the Pacific. ADB Economics Working Paper

Workers more exposed to AI cluster in high income economies, with substantial heterogeneity for *high-skilled workers*

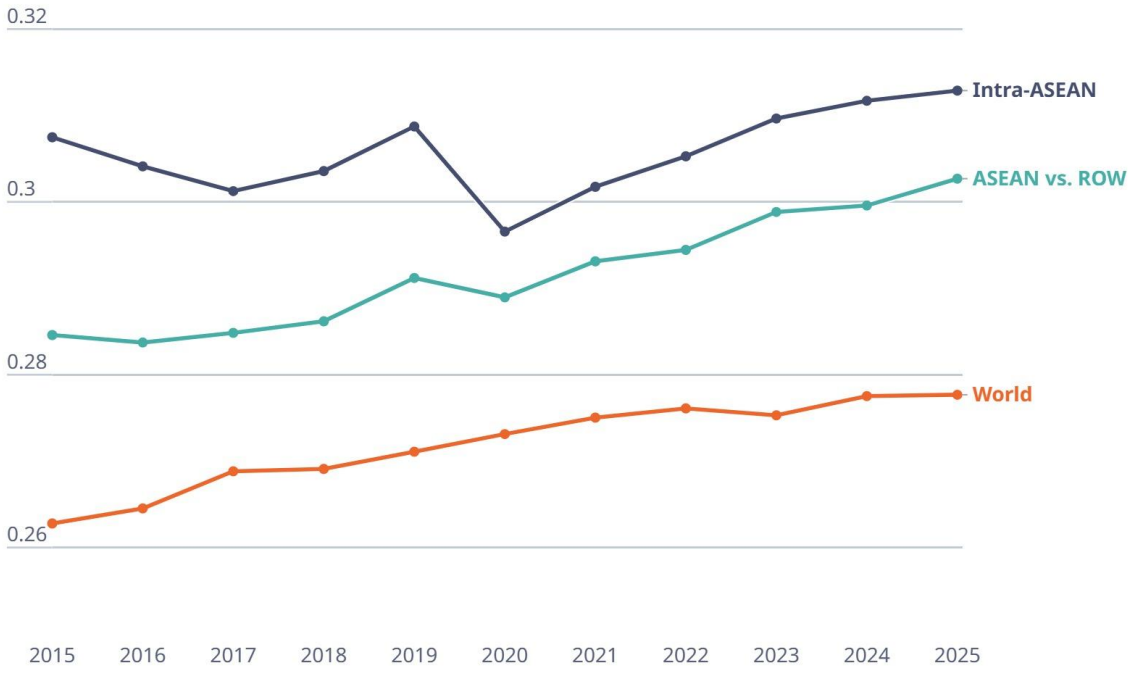


Source: Lewandowski, P., Madoń, K., and Park, A. (2026). Workers' Exposure to Artificial Intelligence Across Development Stages. ADB Working Paper

Strengthening Digital Trade and FDI

Digital fragmentation in Asia is growing

OECD DSTRI Heterogeneity Index, 2015-2025



Approaches to Cross Border Data Flows in ASEAN - 2026



Note: Categorization on ASEAN member states based on domestic regulations to cross-border data flows.
Source: OECD (2026) ASEAN Digital Trade Review.

Note: 'Intra-ASEAN' heterogeneity refers to the average of AMS country pairs. 'ASEAN vs. ROW' (Rest of world) is calculated taking the average of all pairs of AMS and non-ASEAN countries. 'World' refers to the average of all country pairs included in the dataset. Values for the EU are derived by taking the average of all pairs of the respective country and EU Member States. The heterogeneity indices were calculated using the qualitative answers in the DSTRI. For further details on the methodology, see Nordås (2016[22]).
Source: Digital STRI Heterogeneity Indices (2025).

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Priority I. Enhancing Digital Regulations

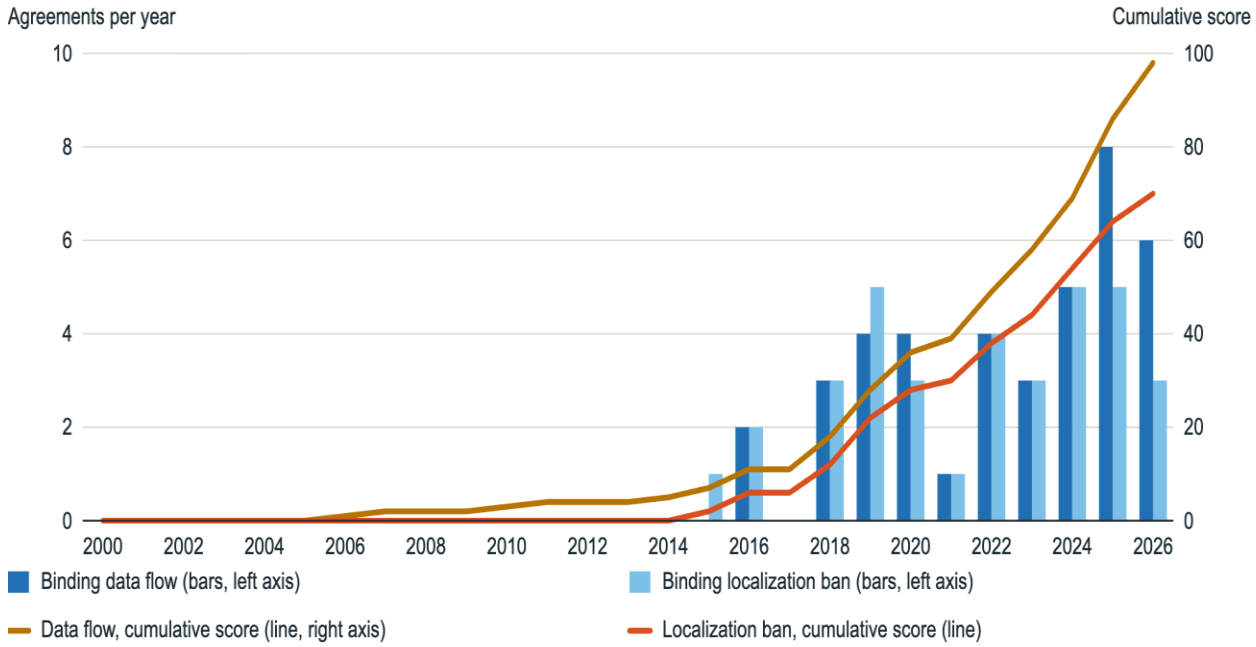
Key issues

- Digital regulation is fragmented and uneven across Asia, with many countries lacking basic rules. (e.g. on data, e-commerce, consumer protection)
- Restrictive data policies (e.g. localization, limited cross-border flows) raise trade costs, especially for MSMEs.
- Low participation of developing countries in modern digital trade agreements limits their influence and benefits.

Areas of work

- Develop foundational digital rules and integrate them into trade frameworks to ensure coherence.
- Promote interoperability, not harmonization - using modular models like DEPA and best-practice templates.
- Use DEAs and RTAs as tools for capacity-building, embedding cooperation, shared standards, and gradual onboarding.

Data Governance Trends in Digital Trade Provisions Among ADB Members



Source: ADB, using data from Trade Agreements Provisions on Electronic Commerce and Data (September 2026). Note that the cumulative total of agreements includes free trade agreements, regional trade agreements, and various upgrades, protocols and other elements, and digital economy agreements. Note that the measure of "Legal bindingness" (the degree to which provisions are legally binding) is scored 0 where provisions are absent, 1 for nonbinding/soft law commitments, and 2 for binding/hard law commitments.

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Priority II. Expanding Digital Economy Agreements

ENCOURAGE SELECTIVE PARTICIPATION:

Allows countries to selectively adopt parts of the agreement that are relevant to their specific digital economy needs.

BUILD FLEXIBILITY INTO LEGAL FRAMEWORKS:

Ensure that these can be adapted to emerging digital economy challenges and future module additions.

FACILITATE REGULATORY COOPERATION FOR INTEROPERABILITY:

Ensure digital regulatory cooperation, enhancing compatibility and communication between digital platforms across borders.

Data Flows	Cybersecurity	Personal Information Protection
Key Issues		
• **Binding rules** can reduce policy space over data governance. • **Data flows favor big tech**, may hurt local players. • **Sovereignty concerns** on enforcement and control.	• **Laws are outdated or underfunded.** • **Limited capacity** to manage threats. • Need for **cross-border coordination**.	• **Weak Data Protection Laws:** in many countries. • **Privacy Concerns:** Conflicts between global data flow and domestic privacy laws. • **Data Localization Challenges:** Issues with compliance and protection standards.
Policy focus		
• Adopt **risk-based, flexible** rules on data flow, using modular and transparent frameworks like DEPA. • Promote **transparent, interoperable** standards.	• **Align and update national frameworks** with international standards • **Invest in cyber capacity-building** • **Foster International cooperation** for sharing cybersecurity threat intelligence and coordinated responses.	• **Strengthen Privacy Laws** and **promote mutual recognition** of standards. • **Encourage Privacy by Design** into digital services from the outset.

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Priority III. Digital Trade Standards

Key issues

- Lack of harmonized digital standards hampers interoperability in digital trade.
- Developing countries are underrepresented in digital standard-setting processes.
- Rapid tech evolution is outpacing regulatory and institutional capacity.
- Private sector engagement in developing and adopting standards remains low.

Policy intervention

- Embed digital standards into trade agreements more explicitly, including rules on data flows, authentication and digital ID.
- Promote modular and flexible agreement structures like DEPA to allow scalable participation.
- Encourage cross-sector coordination between public regulators, private tech players, and global SDOs (ISO, IEC, ITU).
- Use digital trade agreements as platforms for capacity building on standards development.

Digital Standards and DEAs

AI standards

5G and Advanced Telecoms

Examples of provisions in DEAs

- Information sharing on standards, technical regulations and conformity assessment.
- Standards cooperation in AI ethics and AI governance
- Recognition of conformity assessment results
- Participation in regional and multilateral standard-setting bodies

Standard-related provisions

	USJDTA	DEPA	ASDEA	UKSDEA	KSDPA
Logistics	■	■		■	■
E-signature		■	■	■	■
E-invoicing		■	■	■	■
Express shipments		■	■		■
E-payments		■	■		■
Digital identity		■	■	■	■
FinTech		■	■		■
LawTech				■	■
AI		■	■	■	
Paperless trading		■	■	■	■

Source: Kwak, J., Lee, H. Standards in the Age of Digital Trade: A Way Forward

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Priority IV. Re-assessing FDI spillovers

FDI and digital technology adoption

- **Question**: Can inward/outward FDI promote digital and AI adoption?
- **Focus**: Impact of inward/outward FDI on domestic firms
- **Applications**: Korea's Survey of Business Activities

FDI spillovers on labor productivity, cost efficiency and capital intensity

- **Question**: How is FDI impacting Asian firms?
- **Focus**: Impact on ASEAN firms labor productivity and jobs
- **Applications**: World Bank Enterprise Surveys and ADB firm-level FDI

Externalities from digital FDI in Asia

- **Question**: How does inward digital FDI impact domestic firms?
- **Focus**: 22 Asian economies from 2004-2022.
- **Applications**: S&P Capital IQ and ADB's firm-level FDI data.

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A forward looking FDI agenda: AI and digital

What quality FDI means

What benefits?

- Productivity growth
- Value capture
- R&D and innovation
- Resilience
- Better jobs
- Sustainability

How?

- Targeted policies for finance, standards and regulation
- Credit guarantees and blended finance
- Incentives and cluster development
- Industry partnerships

How to enhance digital FDI quality?

Human capital and institutions

- Building digital capabilities locally
- Coordination with technology and innovation agencies

Enhancing digital rules and regulations

- Regulatory approaches that are risk-based, tiered, and proportional
- Sector-specific interventions

Maximizing Development Impact of FDI

Measuring impact

- Evaluations of FDI programs and interventions
- Governance reforms that increase impact
- From volume to value, **fewer** but **better prepared** projects

Regional resilience

- From national to regional spillovers
- Certainty above cost

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Steering Digital Transformation and AI Toward sustainable and Inclusive Development

Key questions:

- What investments in digital/AI are required to realize development gains?
- What measures and policy reforms are needed for AI adoption, adaptation, and advancement without hindering inclusive and sustainable development?
- How will AI readiness, adoption, and adaptation shape Asia's trade competitiveness, and supply-chain resilience?

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Some areas for future research and open to collaboration

Assessment of AI and technology adoption

- Firm-level evidence on AI adoption and adaptation for selected Asian economies
- AI adoption and organizational practices
- Development Impact of Digital tools (e.g. digital platforms)
- Country-level AI readiness index

Economic Analysis of digital interventions

- Cost Benefit Analysis of digital investments
- Economic analysis of digital and AI investment
- Developing data center, digital value chain and ecosystem
- Develop sustainable and inclusive digital infrastructure

Assessment of impacts of Digital/AI transformation and regulation

- Impacts of AI investment on growth, productivity, employment
- Scenarios on digital trade (DEFA implementation, WTO E-commerce adoption)
- Digital FDI, concentration and distributional impacts
- Digital/AI related regulation

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Look forward for research collaboration on digital transformation and AI

Thank you