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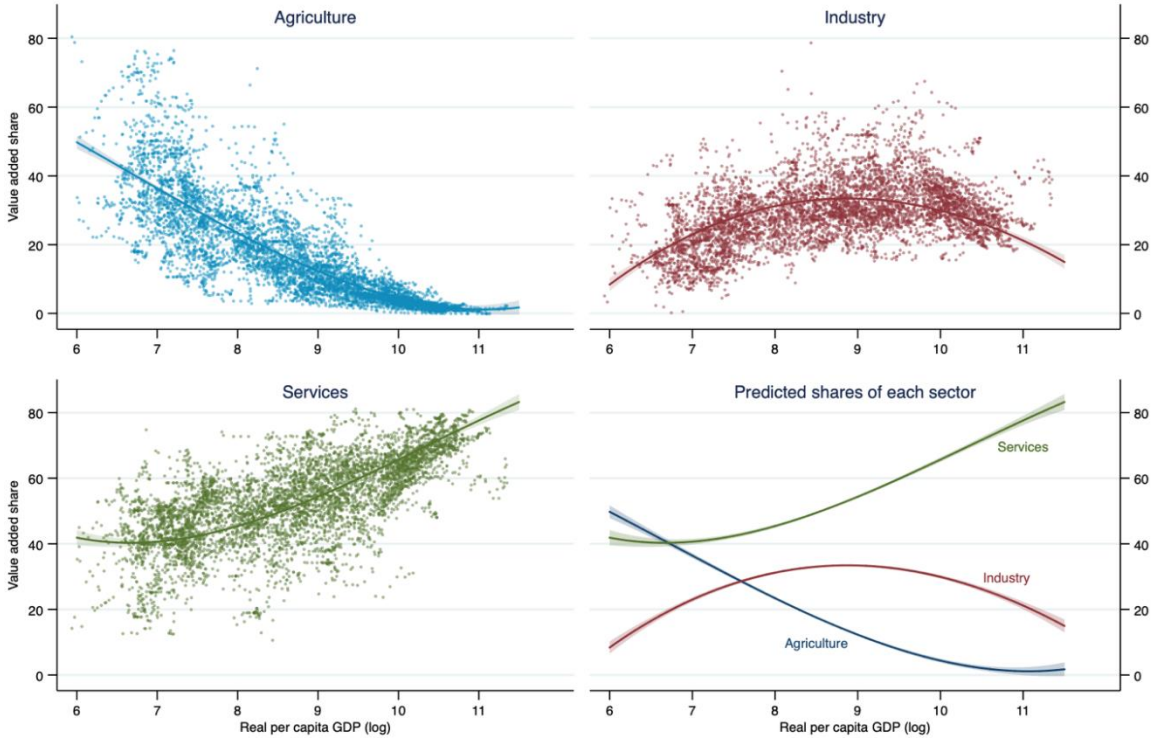
The story of development is one of transformation

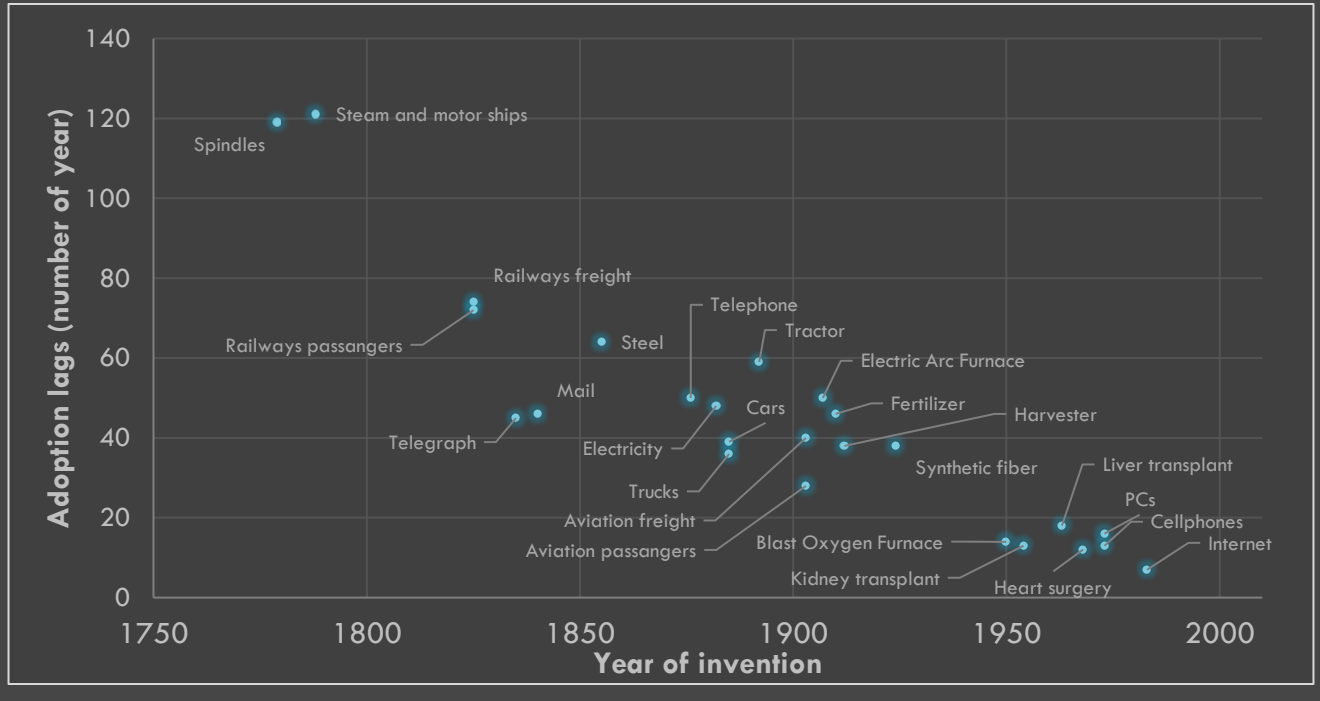
- As countries become richer, more of their income comes from non-agriculture sector.
- More of the value added is being captured by the other sectors, through technological products and services



Technological progress is a fundamental force for development

- Technology is a main driver of economic growth and living standards. It increases productivity, thereby boosting per capita income and consumption.
  - The printing press, railways, radio and television, agriculture, antibiotics and better vaccines, easier access to clean water, improved sanitation, better access to electricity, new types of engines, revolutionary communications, the transistor, and countless other examples.
- Technology also influences the nature and quality of work, as well as the structure of societies
  - Technology, institutions and society tend to evolve together.

Adoption lags of new technologies, average number of years



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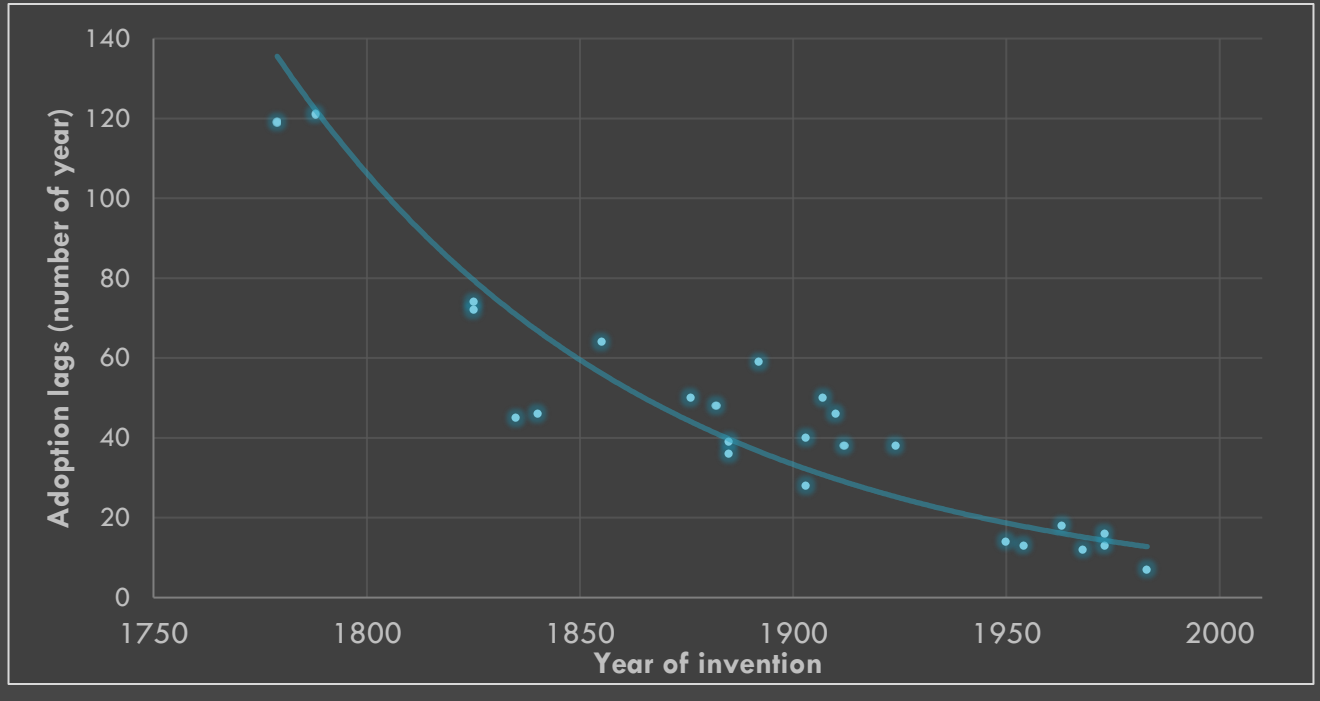

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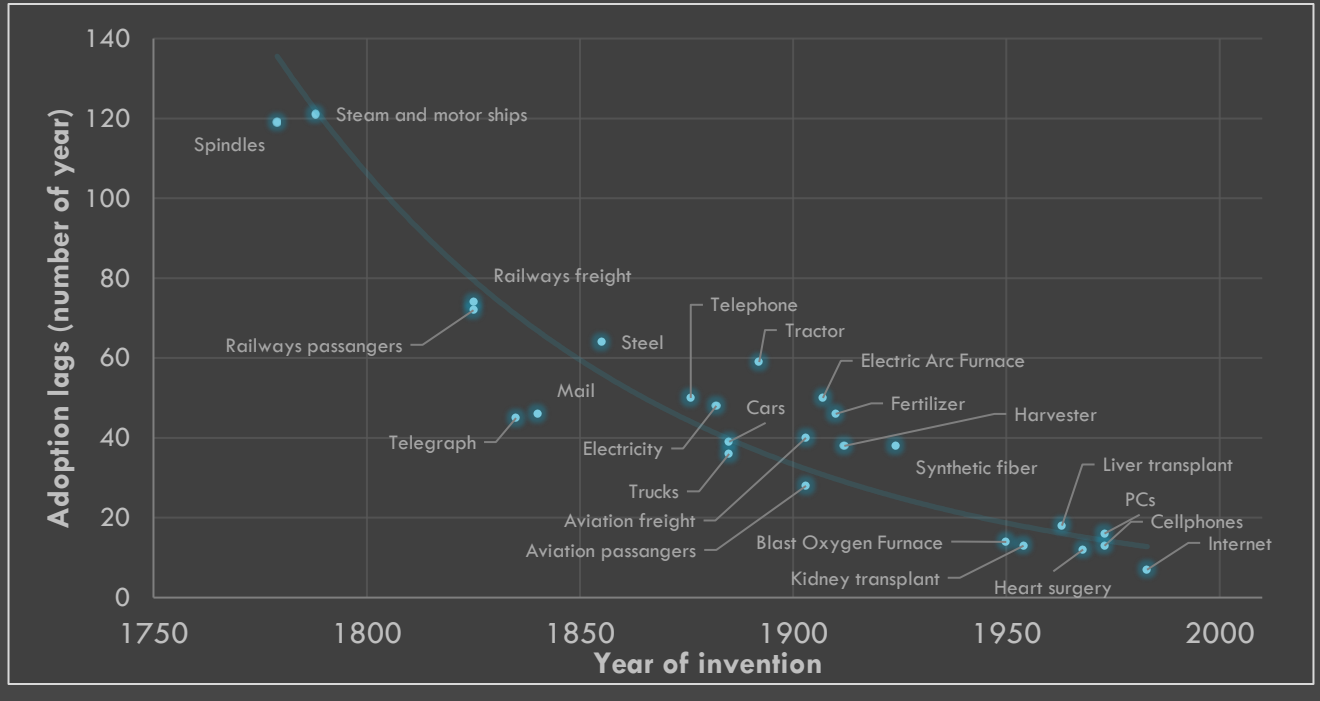

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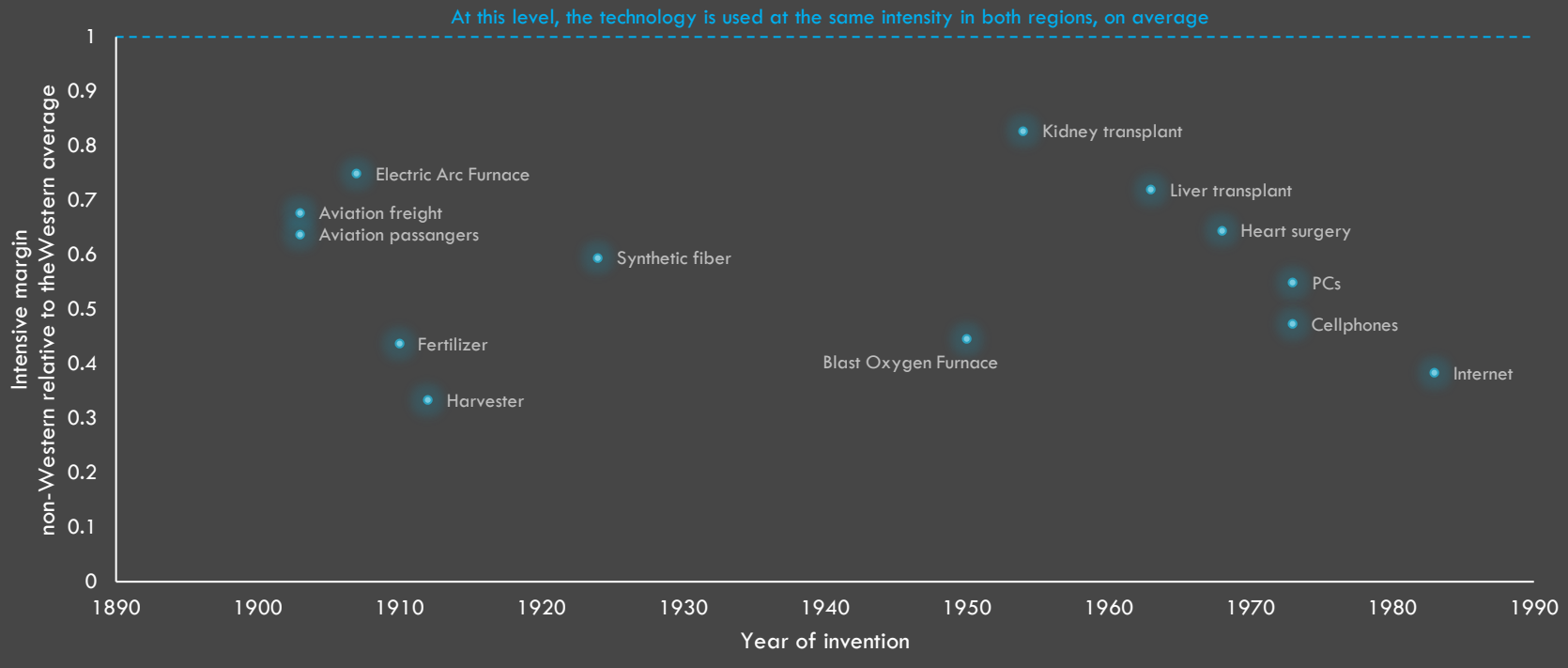
There is a constant gap in the intensity of use of technology



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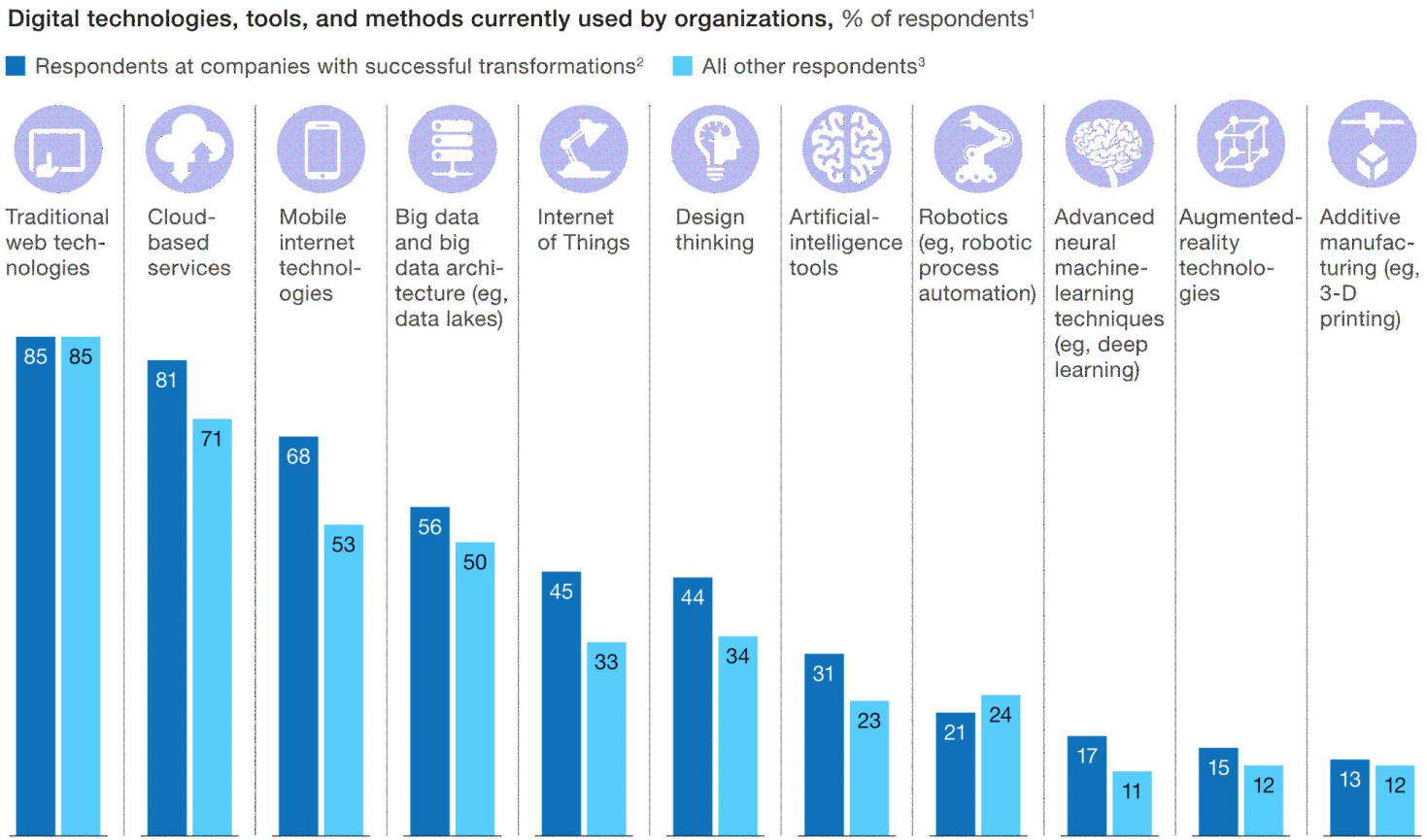
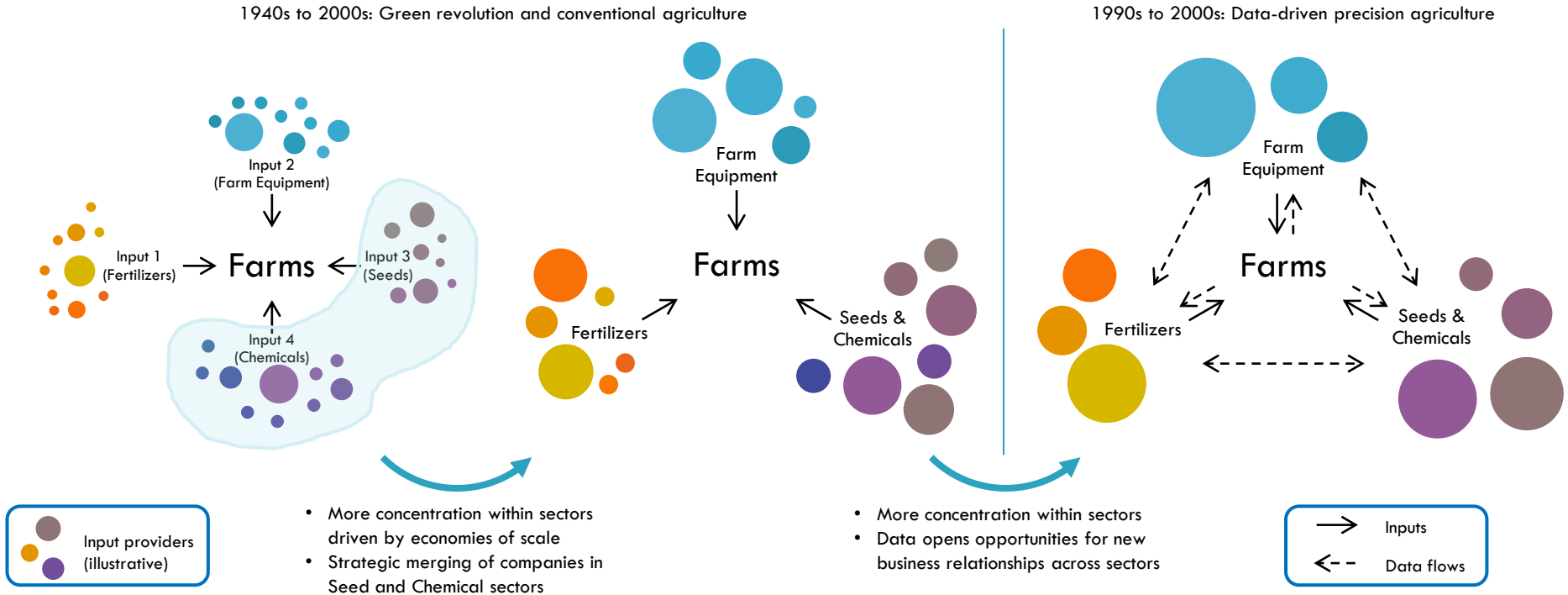
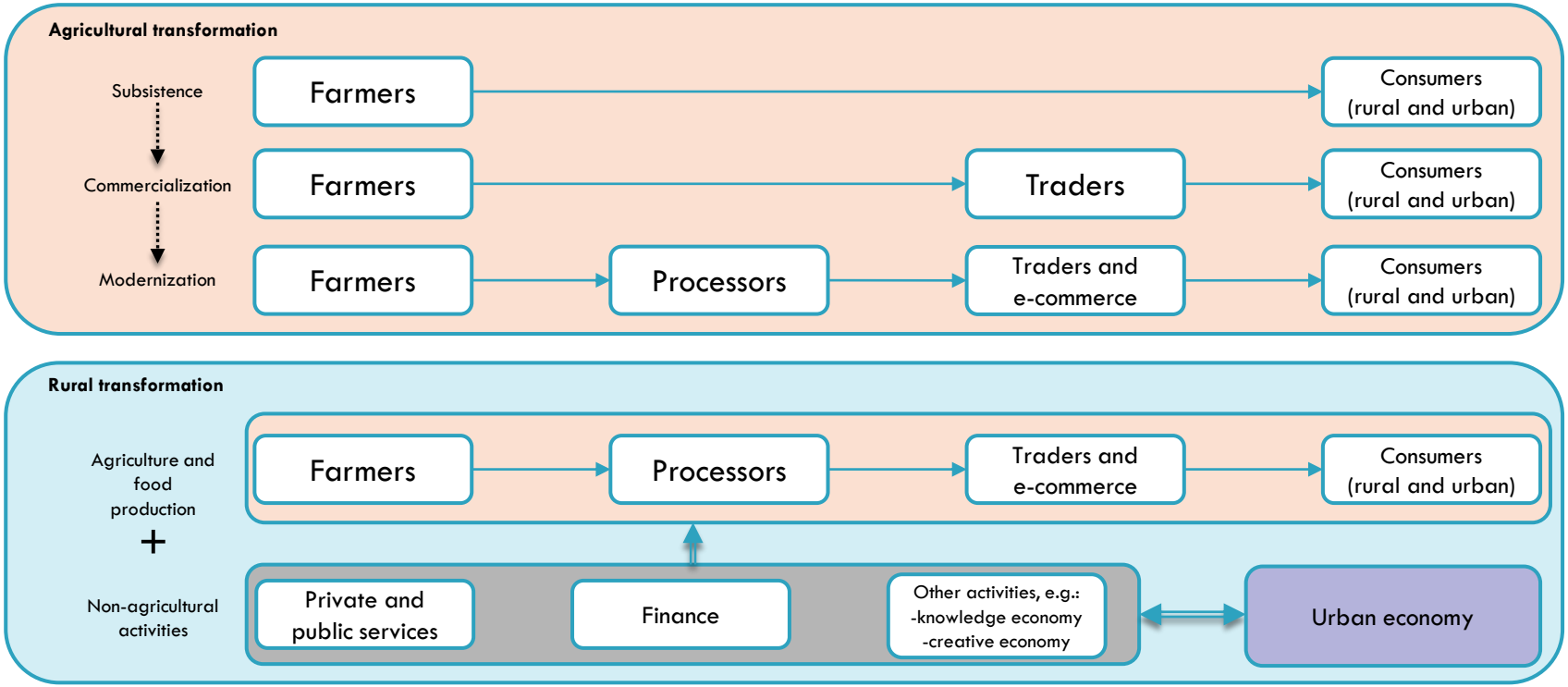


Source: www.mckinsey.com/business-functions/people-and-organizational-performance/our-insights/unlocking-success-in-digital-transformations

Data in agriculture: from green revolution to precision farming



Agricultural transformation through higher productivity and value chains

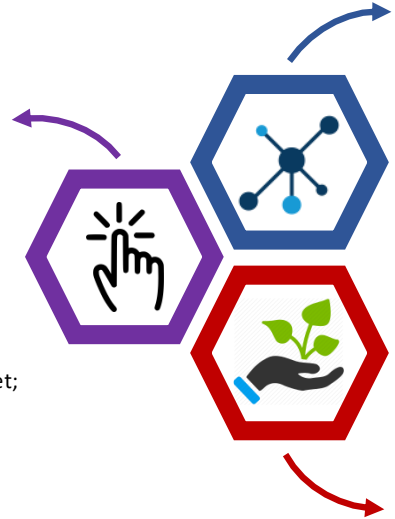


Examples of digital technologies used for access to services, markets, and assets

Access to services

Digital advisory services: value-added services; smart advisory; weather information; pest and disease management; product verification; record keeping

Digital financial services: credit and loans; input financing; credit scoring; crowdfunding; insurance; digital wallet; savings; accountability tools



Access to markets

Digital procurement: digital records; digital records with payments; digital records with traceability; digital records with payments and traceability

E-commerce: buy inputs; sell outputs

Access to assets

Smart farming: smart shared assets; equipment monitoring; livestock and fisheries management

Source: *"Frontier technologies for smallholder farmers: Addressing information asymmetries and deficiencies"*

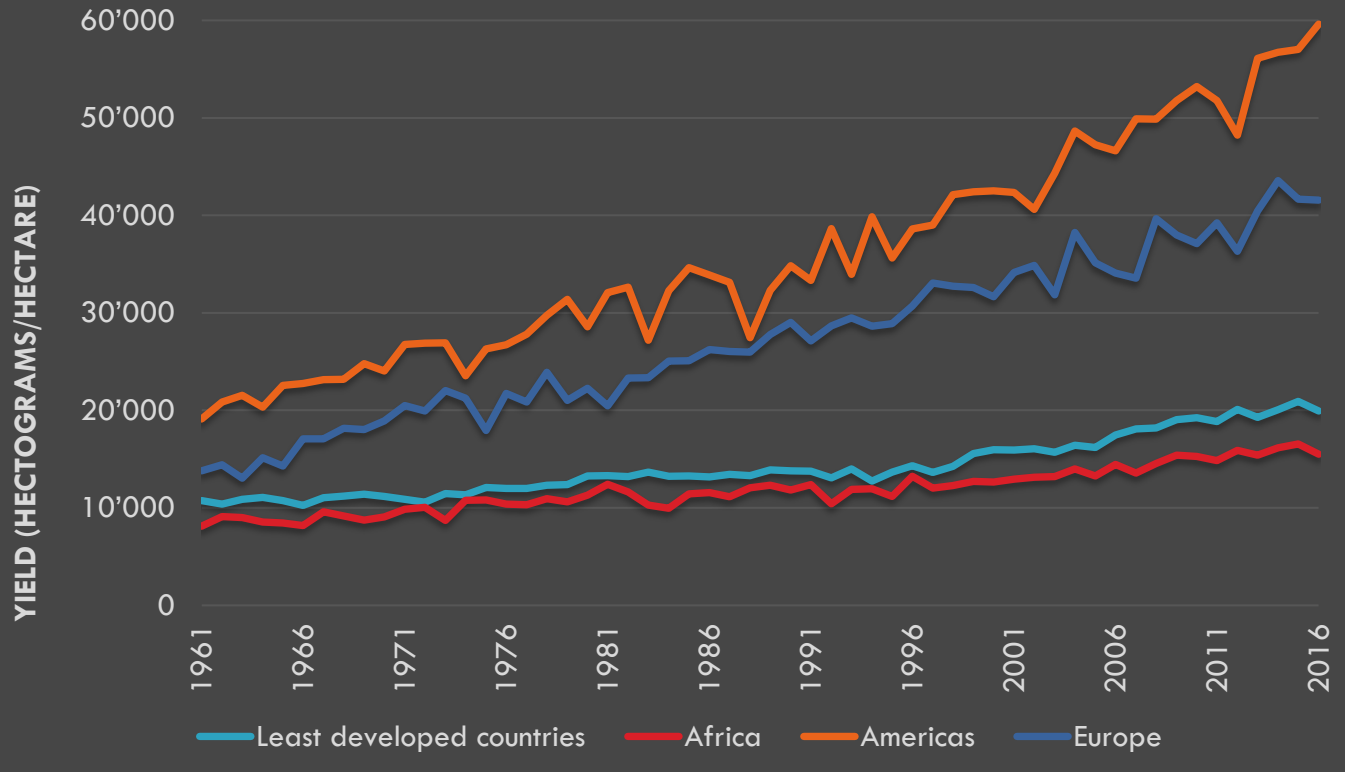
Group		Short description	Criteria
Front runners (10 economies)		Top 10 leaders in the field of advanced digital production technologies	Economies with 100 or more global patent family applications in advanced digital production technologies (average value for all economies with some patent activity in this field)
Followers in production (23 economies)	As innovators	Economies actively involved in patenting in the field of advanced digital production technologies	Economies with at least 20 regular patent family applications, or 10 global patent family applications in advanced digital production technologies (average values for all economies with some patent activity, once front runners are excluded)
	As exporters	Economies actively involved in exporting goods related to advanced digital production technologies	Economies relatively specialized in exporting goods related to advanced digital production technologies that sell large volumes in world markets (above the average market share once frontrunners are excluded)
Followers in use (17 economies)	As importers	Economies actively involved in importing goods related to advanced digital production technologies	Economies relatively specialized in importing goods related to advanced digital production technologies that purchase large volumes in world markets (above the average market share once frontrunners are excluded)
Latecomers in production (16 economies)	As innovators	Economies with some patenting activity in advanced digital production technologies	Economies with at least one regular patent family application in advanced digital production technologies
	As exporters	Economies with some exporting activity of advanced digital production-related goods	Economies that either show relative specialization in exporting advanced digital production-related goods or sell large volumes in world markets (above the average market share once frontrunners are excluded)
Latecomers in use (13 economies)	As importers	Economies with some importing activity of goods related to advanced digital production	Economies that either show relative specialization in importing goods related to advanced digital production or sell large volumes in world markets (above the average market share once frontrunners are excluded)
Laggards (88 economies)		Economies showing no or very low engagement with advanced digital production technologies	All other economies not included in the previous groups

Economies actively engaging with advanced digital production technologies

Source: UNEN Megatrends report and UNIDO

Group	Countries
Frontrunners (10 economies)	China, France, Germany, Japan, Korea (Republic of), Netherlands, Switzerland, Taiwan Province of China, United Kingdom, United States
Followers in production (23 economies)	Australia, Austria, Belgium, Brazil, Canada, Croatia, Czechia, Denmark, Finland, Hong Kong SAR (China), India, Ireland, Israel, Italy, Lithuania, Luxembourg, Norway, Poland, Russian Federation, Singapore, Slovakia, Spain, Sweden
Followers in use (17 economies)	Algeria, Argentina, Bangladesh, Belarus, Colombia, Hungary, Indonesia, Iran (Islamic Republic of), Malaysia, Mexico, Portugal, Romania, Saudi Arabia, South Africa, Thailand, Turkey, Viet Nam
Latecomers in production (16 economies)	Bosnia and Herzegovina, Bulgaria, Chile, Dominican Rep., Estonia, Greece, Kyrgyzstan, Latvia, Moldova (Republic of), New Zealand, Nigeria, Philippines, Slovenia, Ukraine, United Arab Emirates, Venezuela (Bolivarian Republic of)
Latecomers in use (13 economies)	Costa Rica, Cote d'Ivoire, Ecuador, Egypt, El Salvador, Ethiopia, Malawi, Serbia, Tunisia, Turkmenistan, Uganda, Uzbekistan, Zambia
Laggards (88 economies)	All other economies that, according to the United Nations Statistical Division, had more than 500,000 inhabitants in 2017

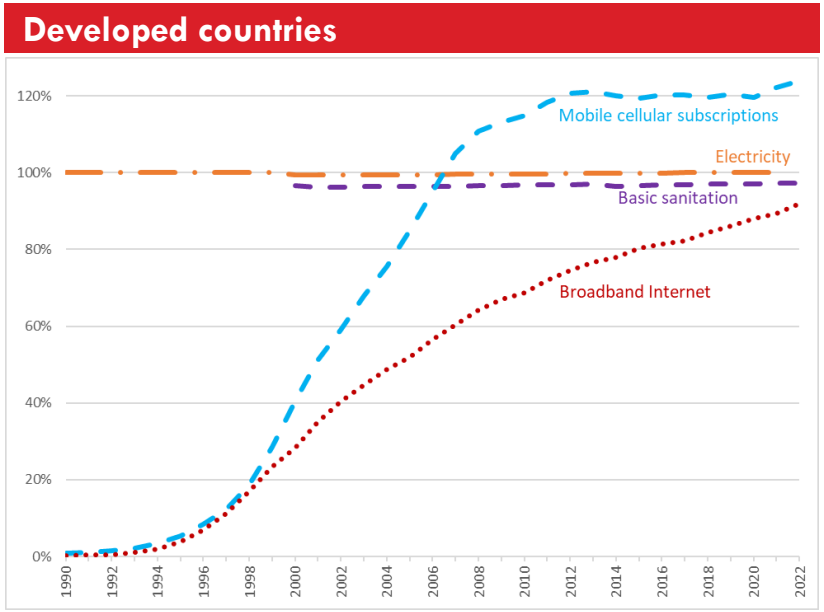
Total cereal yield, Africa, Americas, Europe and least developed countries, 1961-2016

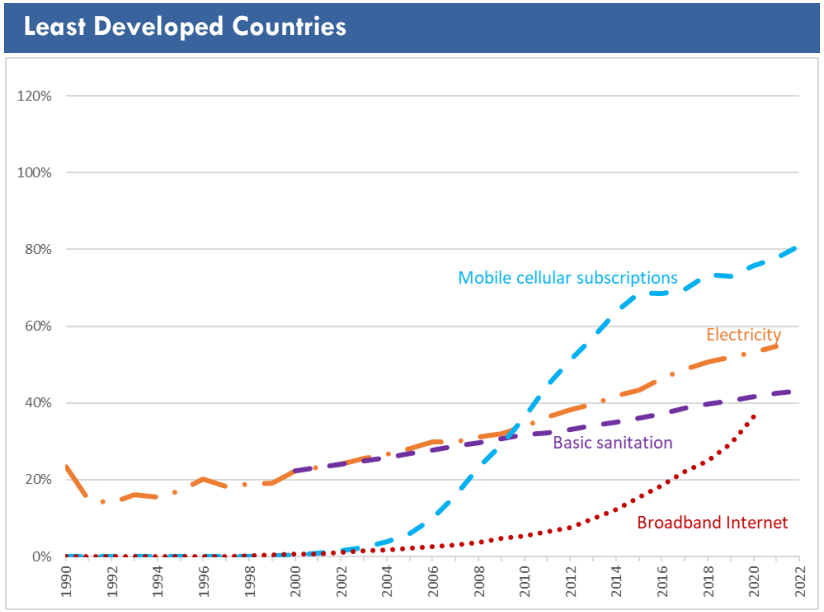


Source: FAOSTAT

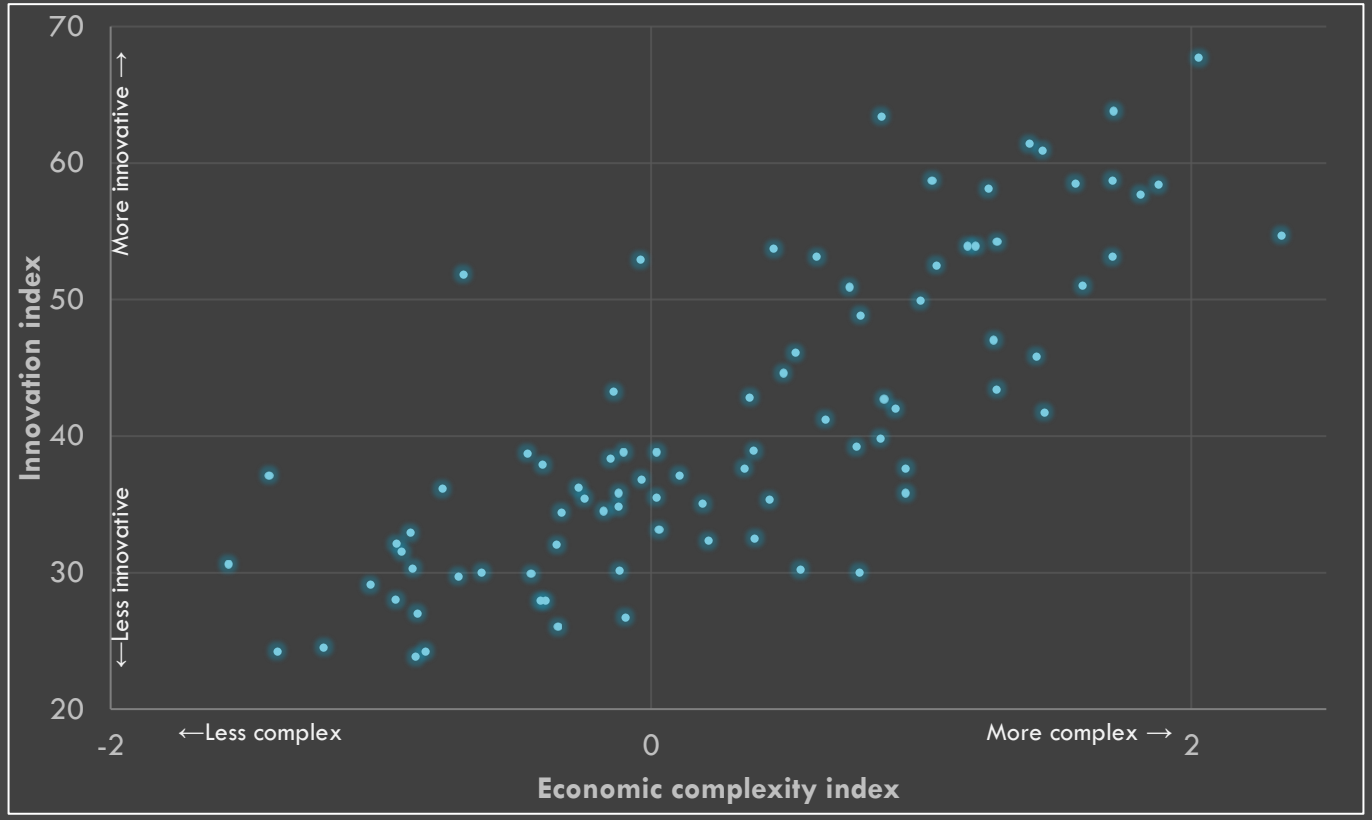
The gap in the use of digital technologies remains wide

Proportion of people with access to various technologies, developed and least developed countries, 1990–2022





More complex and advanced economies are also more innovative



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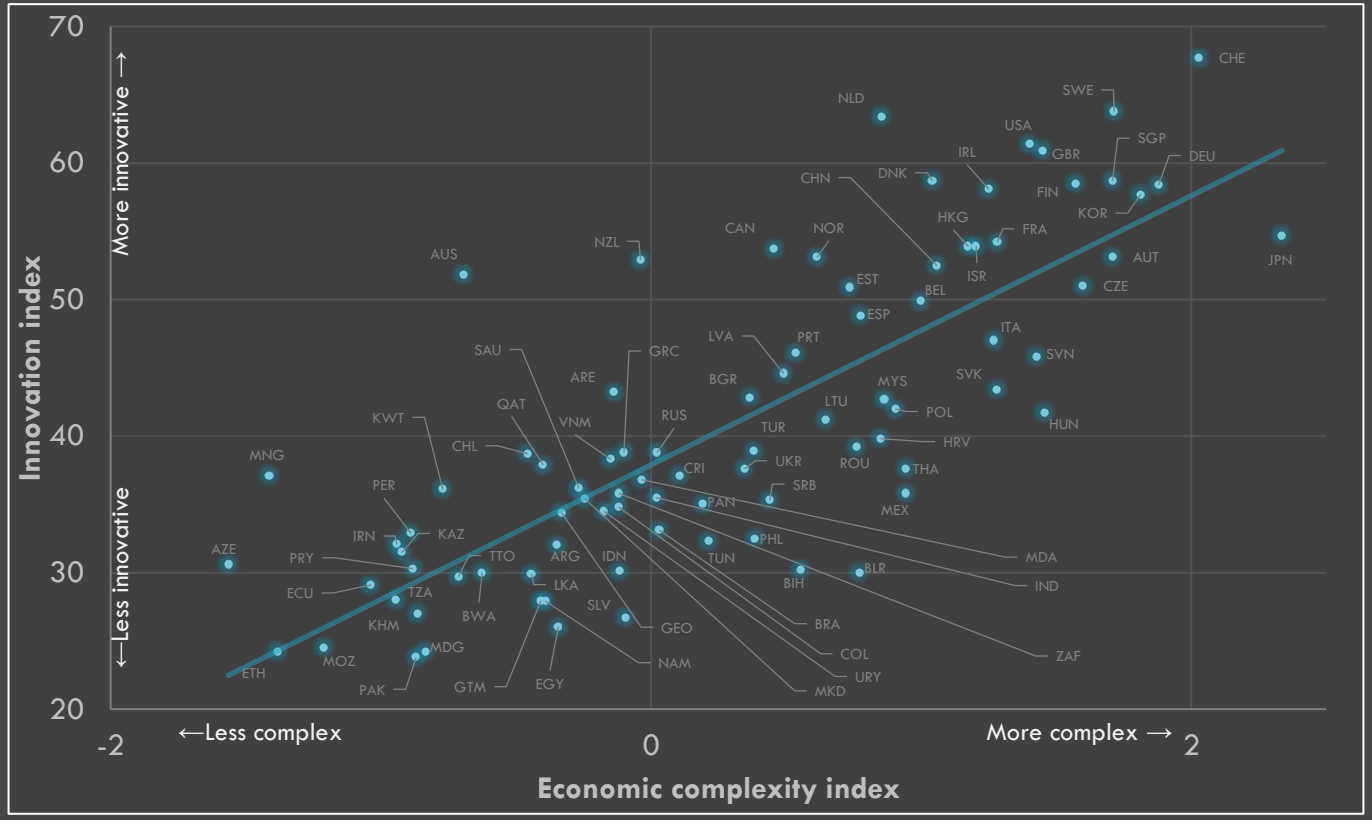
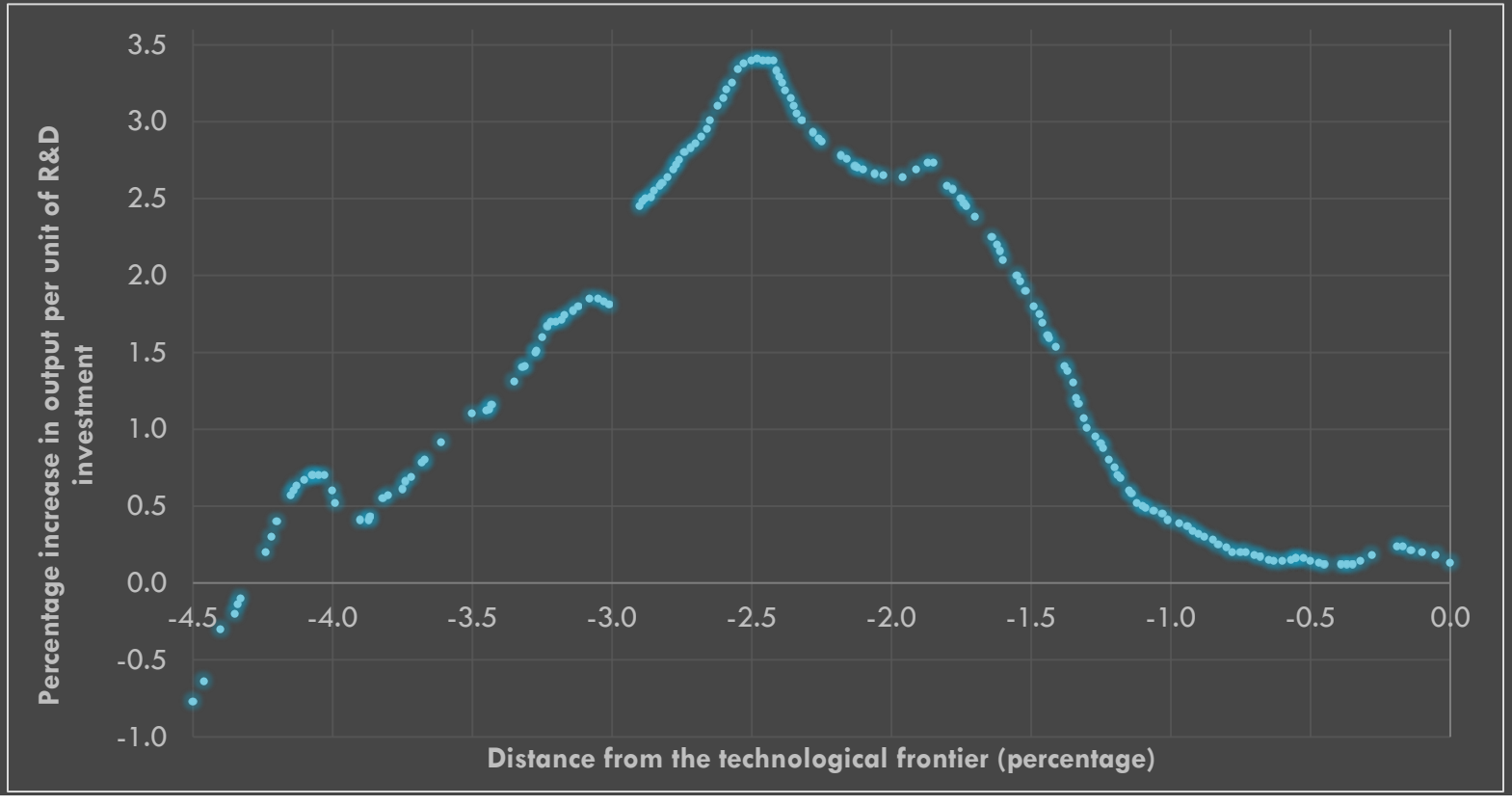


Rate of return to R&D according to distance from the technological frontier



Source: Cirera and Maloney (2017), figure 3.2

Economies with more embedded technology grow at a faster rate

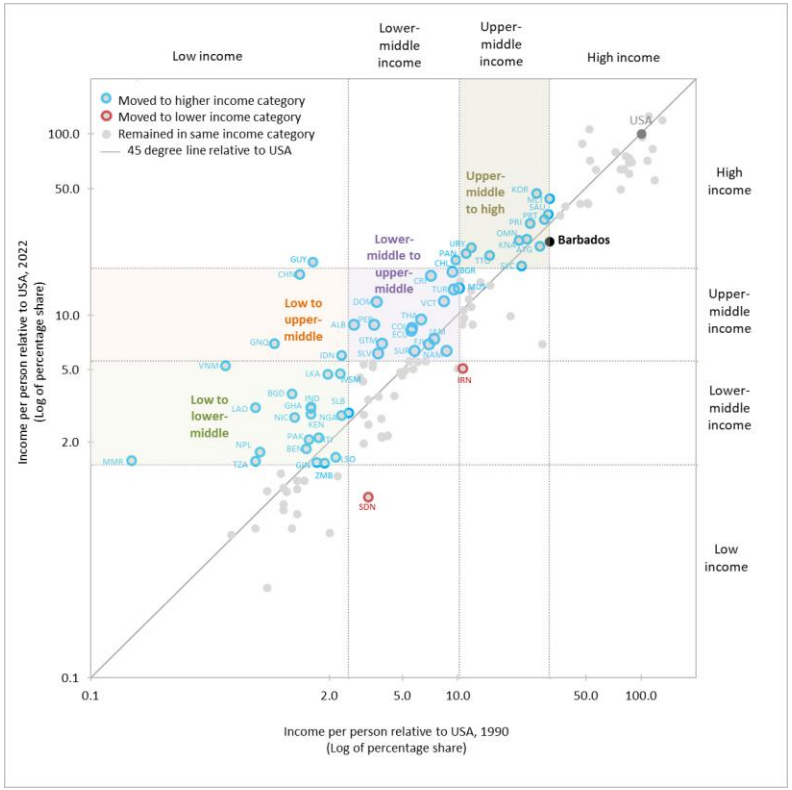
Initial Economic Complexity and subsequent growth of real GDP in the following decade

The implication is that countries that lag too far behind in technology and broader development conditions may find it more difficult to catch up because they lack the complementary factors needed for firms to innovate.

Source: UN DESA calculations based on the methodology of Hausmann et al (2013).

Several countries have managed to grow and catch-up

Income per person relative to the United States, by income group, 1990 and 2022



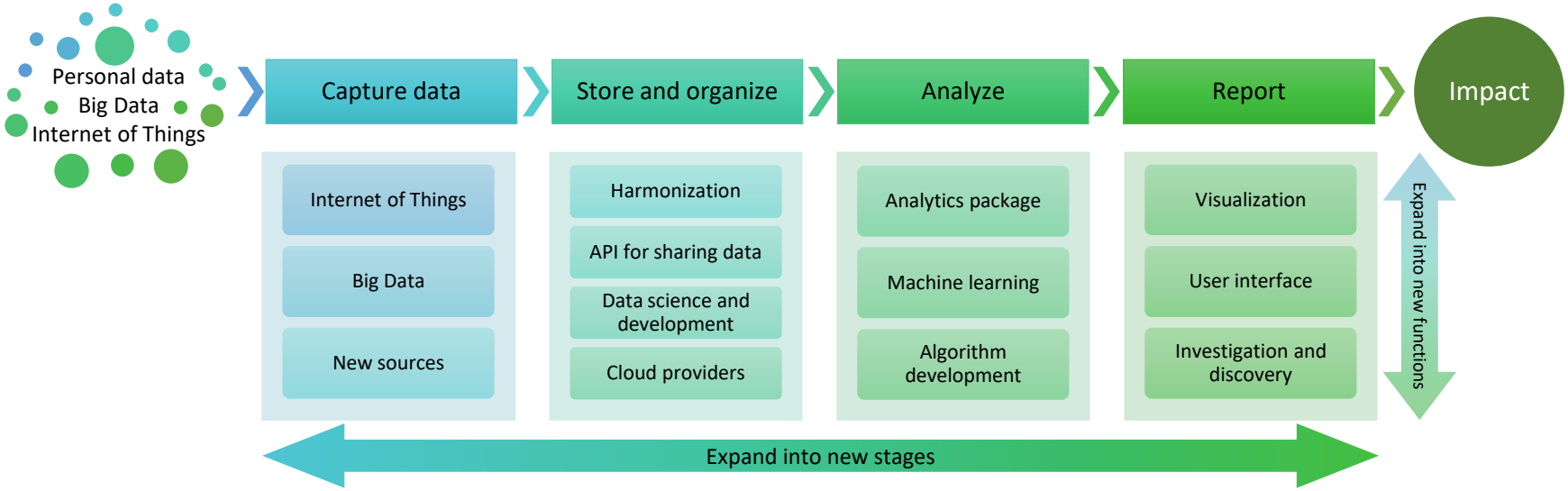
Will this story continue under rapid digitalization and technological progress?

Source: UN DESA, based on data from World Development Indicators database.

Transformation is increasingly driven by access and adoption of technologies

- Data is increasingly a critical factor of production, complementing labour and physical capital.
- Digital technologies, underpinned by the data economy, are transforming economic relationships.
- The value of data is captured by the companies that collect and analyze it, leaving little surplus to the sources of data.

The data value chain: from data sources to economic impact



Firms can provide multiple data functions and capabilities to capture value from data

A few firms and countries dominate innovation in many frontier technologies

- There are concerns that rising market concentration reflects not only leading firms' higher productivity, but also network effects, economies of scale and economies of scope
- These effects could potentially allow them to remain dominant, without necessarily being more innovative than their competitors.

What does it mean for Barbados?

Based on “Digital Transformation of Barbados: Challenges and Way Forward”, by Rashmi Banga

Challenges in Barbados' Digital Evolution

- Technology Adoption and Digital Infrastructure:
  - Lack of technology transfer.
  - Need for building a data-sharing culture.
  - Glitches in implementation and usability issues with websites and portals.
- Economic and Financial Barriers:
  - High debt/GDP ratio hindering access to finance.
  - Need for rebalancing the tax burden to support firm-level growth.
  - Necessity to encourage foreign direct investment in new growth sectors.

Challenges in Barbados' Digital Evolution

- Societal and Demographic Challenges:
  - Aging society distrustful of technology.
  - Public distrust and unfamiliarity with technology.
  - Fear of job loss due to automation.
- Government Policy, Communication, and Implementation:
  - Deficit in implementing reform initiatives.
  - Challenges in effectively communicating government initiatives and their outcomes.
  - Distrust in the government's ability to secure citizens' data.

Challenges in Barbados' Digital Evolution

- Cybersecurity and Data Protection:
  - Need for improved cybersecurity measures and data protection.
  - Concerns over government capacity to protect citizens' sensitive data.
- Business Environment and Job Creation:
  - Improving ease of doing business to enhance Barbados' attractiveness.
  - Creating job opportunities for citizens.
  - Continuing digitalization efforts.

Three areas where Barbados continues to excel

- Achievements in Digital Transformation
- Pioneer in the Digital Economy
- Strengthening Digital Capabilities and Collaboration

Achievements in Digital Transformation

- Established Digital Infrastructure:
  - Barbados has significantly developed its ICT infrastructure, positioning it well among Small Island Developing States.
- Data Infrastructure and Technology:
  - Initiatives to enhance data infrastructure, including broadband, digital skills development, and data storage capacities, are underway to lower internet costs and build public trust in data sharing.

Pioneer in the Digital Economy

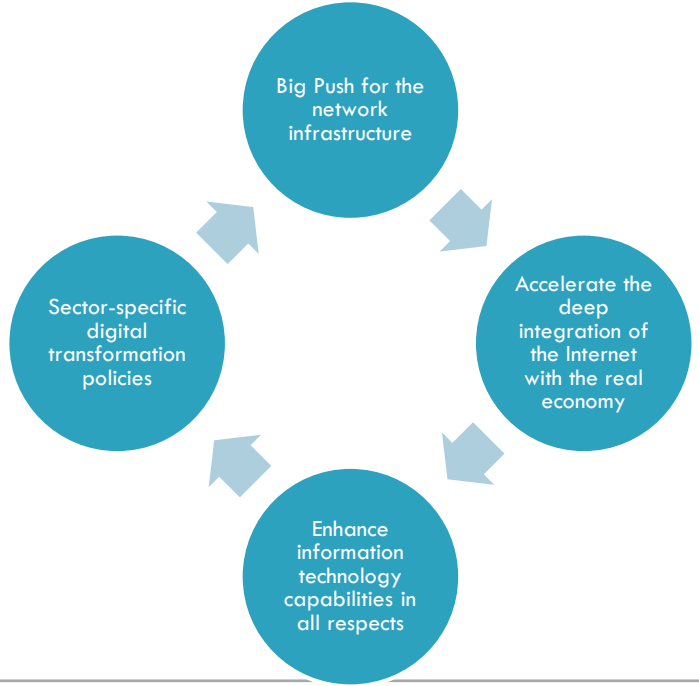
- Regional Data Processing Hub:
  - Progress in becoming the Caribbean's data processing hub through efforts in data collection, storage, and processing to boost global digital competitiveness.
- Digital Startup Ecosystem:
  - Launch of the Barbados Entrepreneurship Foundation and policy incentives to attract domestic and foreign investments in digital startups, aiming to foster innovation and support the digital transformation of the Barbados economy.

Strengthening Digital Capabilities and Collaboration

- Digital Skills Enhancement:
  - Significant strides in digital education and skill development to address the digital skill gap, focusing from basic digital literacy to advanced technological and entrepreneurial skills.
- Collaborative Digital Transformation Efforts:
  - Efforts to build a collaborative ecosystem involving public investments, private sector engagement, and international partnerships to enhance the digital transformation process, drawing on global best practices and adapting them to local needs.

Looking ahead: Addressing demand and supply side constraints

- A comprehensive national policy for building its digital economy
  - phase 1 a big push to build digital network infrastructure
  - phase 2 accelerate deep integration of the internet with the real economy.
  - Phase 3 enhancing information technology capabilities in all respects to drive national modernization.
  - Phase 4 sector-specific policies to enhance digitalization of the sectors.



Thank you