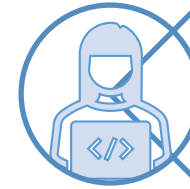




Digital Progress and Trends Report 2023

Measuring digitalization to close the divide

The World Bank has launched a new biennial report: Digital Progress and Trends Report



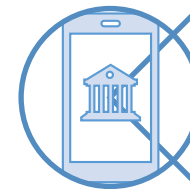
Digital Adoption



The Digital Sector



Digital Infrastructure



Digital Public Infrastructure



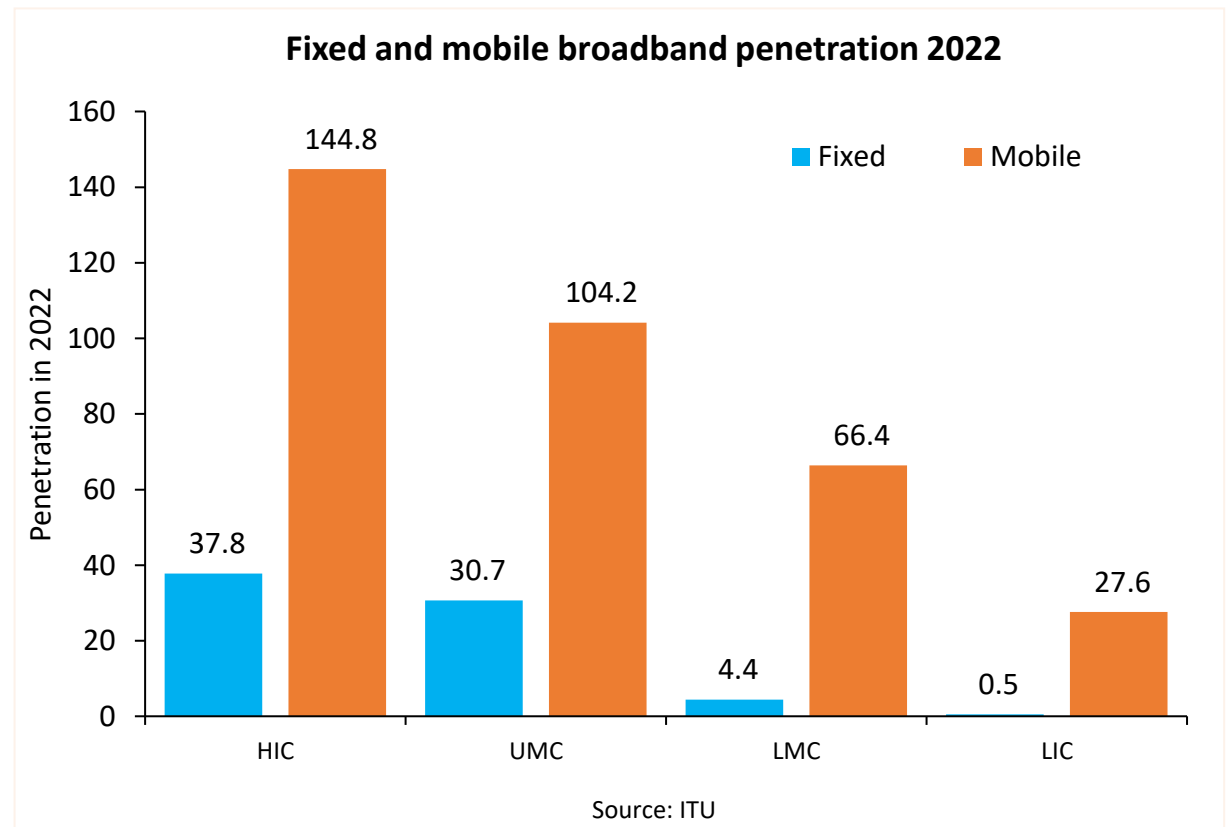
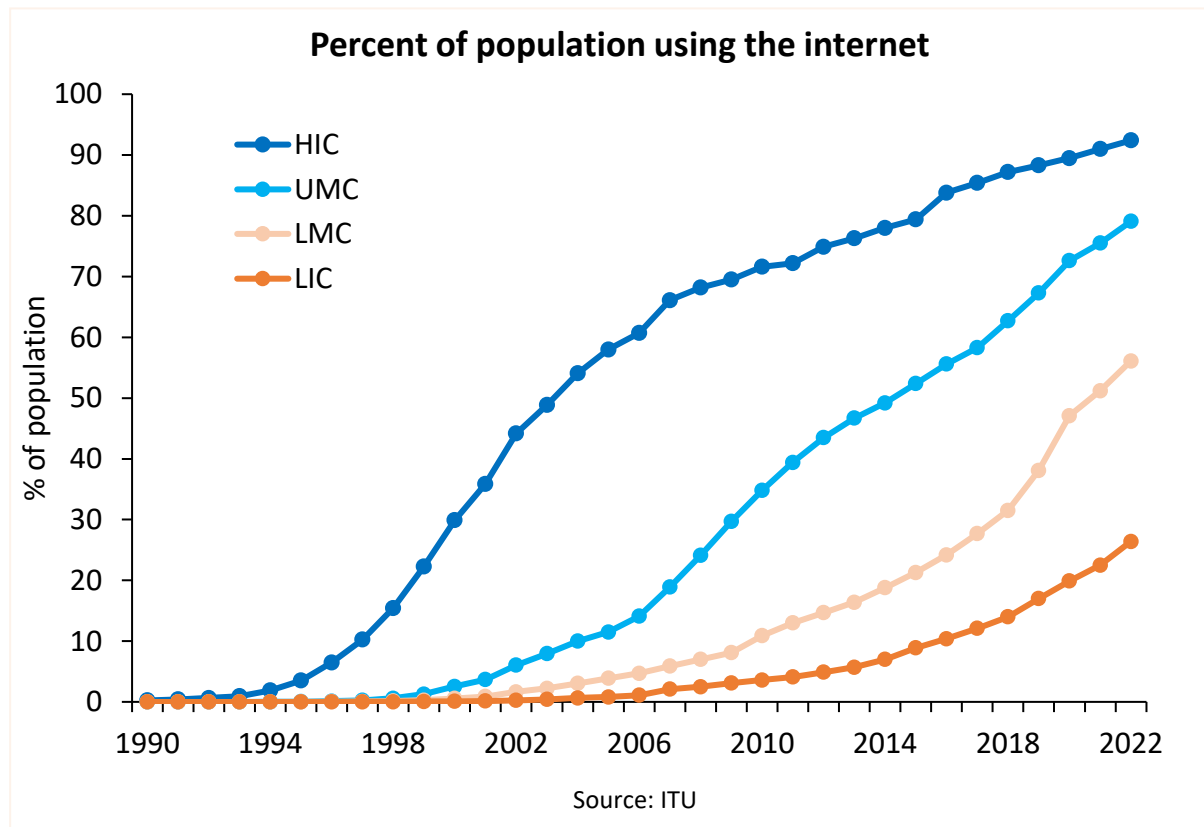
Artificial Intelligence

Internet usage is speeding up in middle-income countries, but low-income countries are falling further behind.

The world gained **1.6 billion** new internet users during 2018-2023. The number of internet users has reached **5.4 billion** in 2023, representing **two-thirds** of global population.

However, LICs continue to lag, where only **one out of four** individuals use the Internet in 2022.

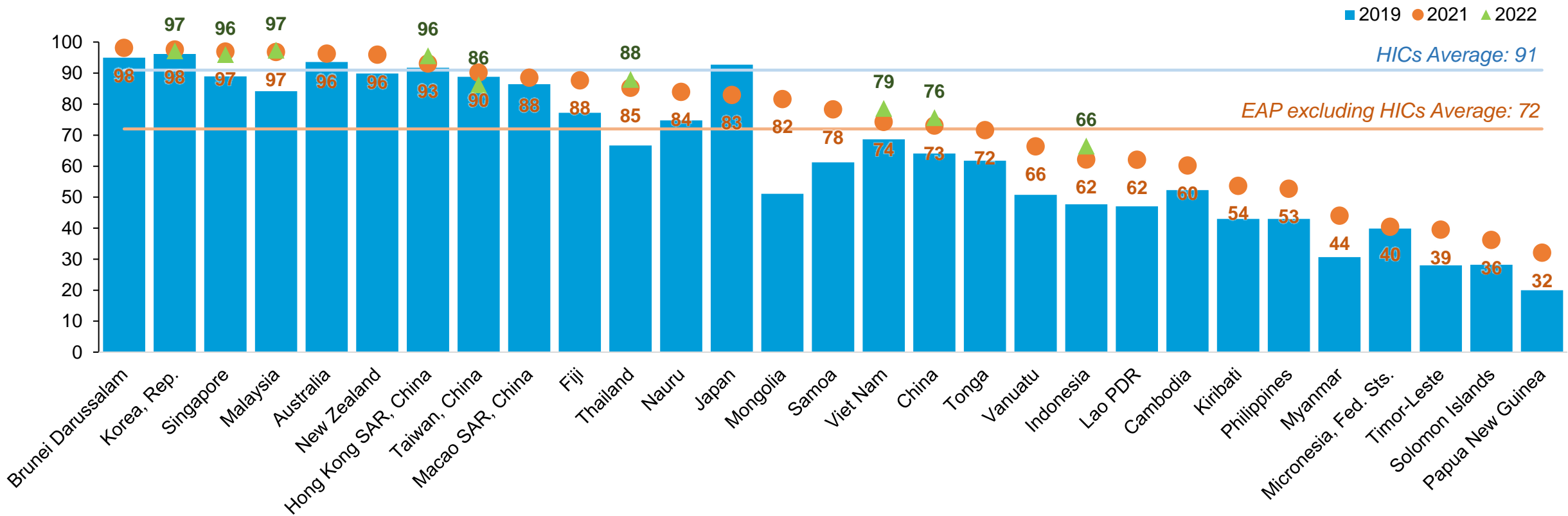
The stark divide in fixed broadband penetration between rich and poor countries has widened: penetration was **above 30** in HICs and UMCs, but only **4 and 0.5** in LMCs and LICs.



72% of people in EAP (excluding HICs) are online, but Myanmar, Solomon Islands, and Papua New Guinea lag with less than half of population using the internet.

- Surge in internet users by 14% from 2019 to 2022, with **72%** people online in EAP region in 2022 excluding high-income economies.
- Globally, 91% of population in HICs were online in 2022, followed by 84% in ECA, 77% in LAC, and 73% in MENA.
- Marked disparities within EAP, with usage **below 50%** in **Myanmar, Micronesia, Timor-Leste, Solomon Islands, and Papua New Guinea**.

% population using the internet, 2019 vs. 2022

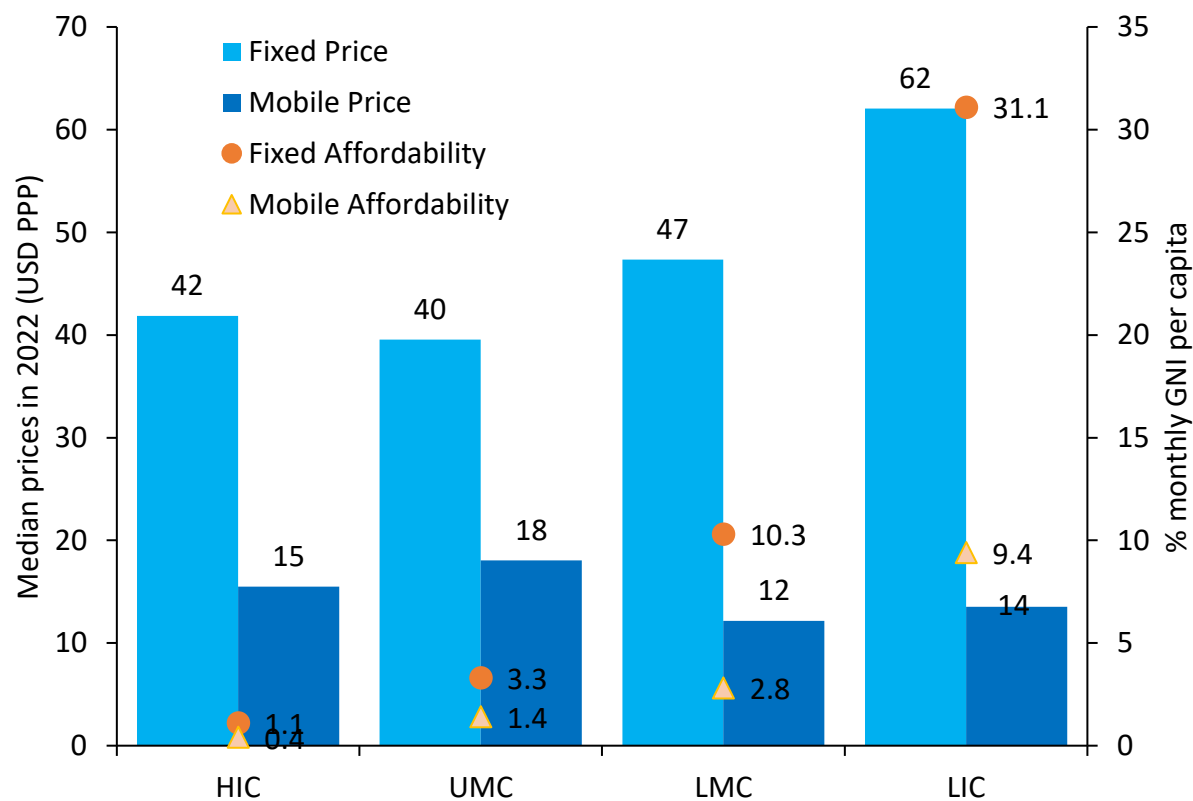


Affordability of broadband plans and digital devices continues to be an important barrier to universal connectivity and data usage.

Median fixed broadband price in LICs remains **50% higher** than in other income groups in 2022, accounting for nearly **a third of monthly GNI per capita**.

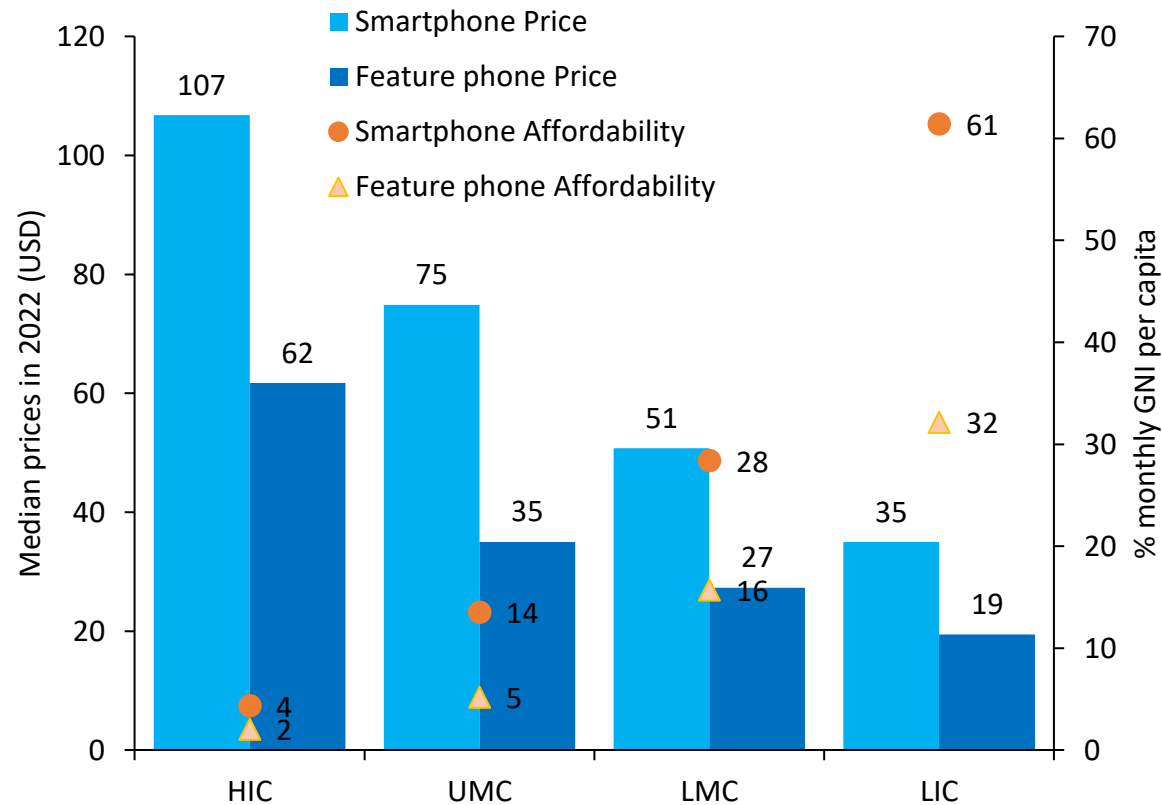
Smartphones remain unaffordable in poorer economies, where even the cheapest smartphone accounts for **30-60% of monthly GNI per capita** in LMCs and LICs.

Broadband prices in 2022



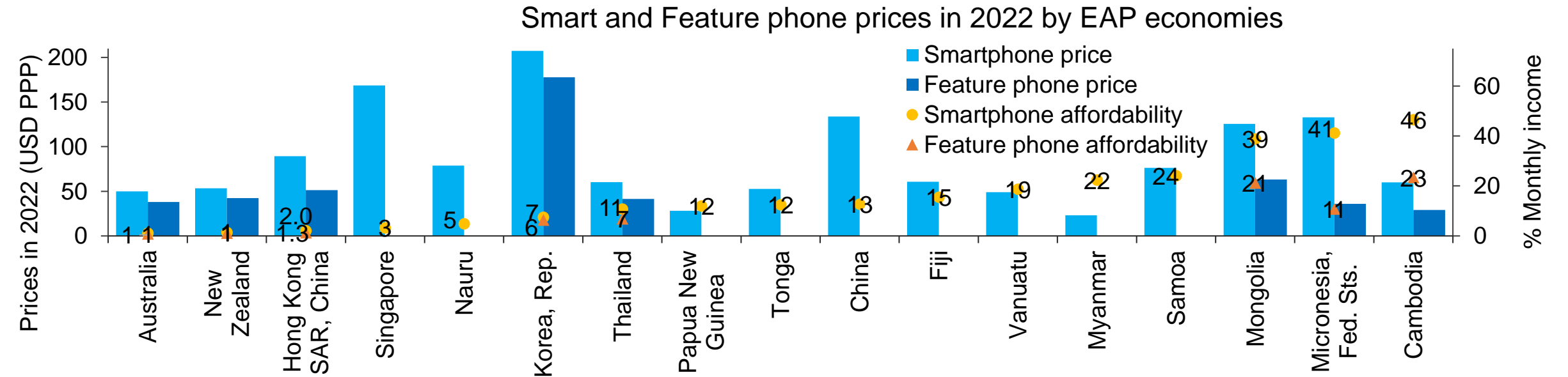
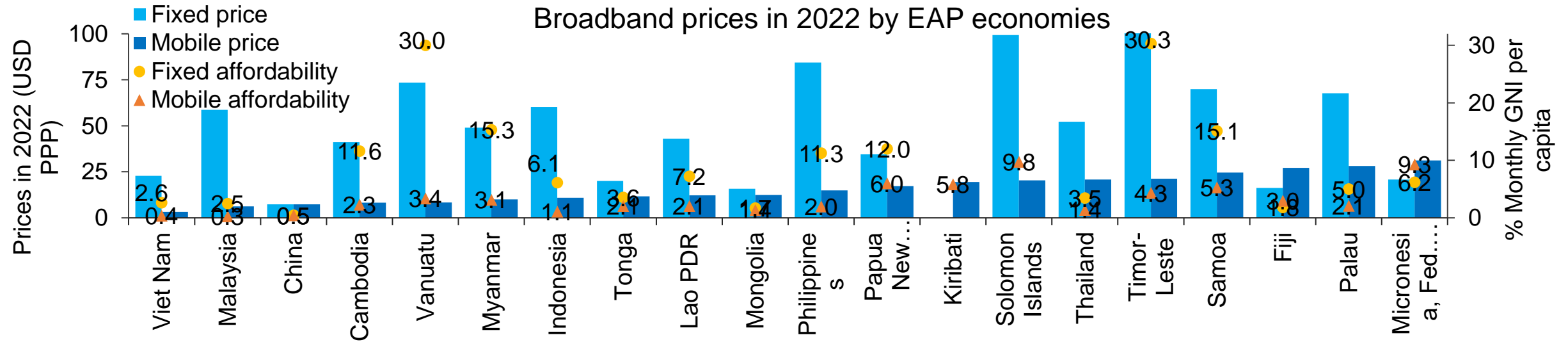
Source: ITU

Smart and feature phone prices in 2022



Source: A4AI

Within EAP, fixed broadband is particularly unaffordable in small states, Myanmar, and the Philippines. Smartphones are prohibitively expensive in several small states, Mongolia, and Cambodia.

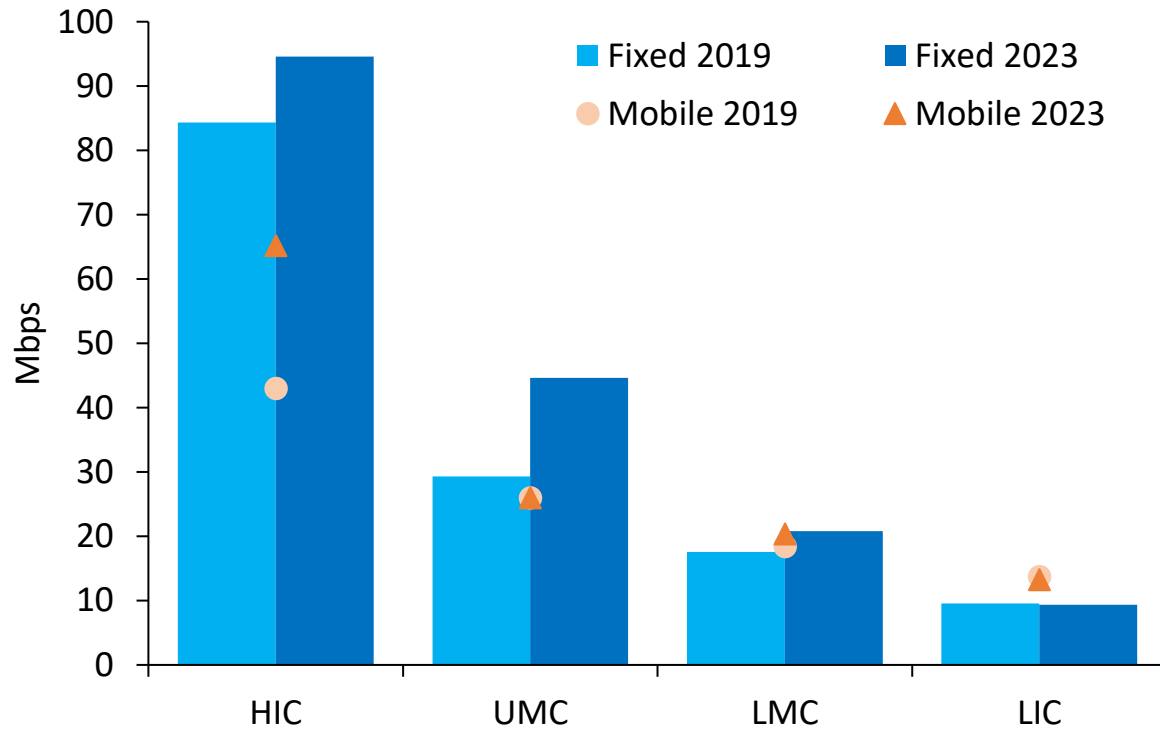


Larger gaps are forming in Internet speeds and data usage.

In 2023, median mobile and fixed broadband speeds in HICs are **5** and **10** times of those in LICs respectively.

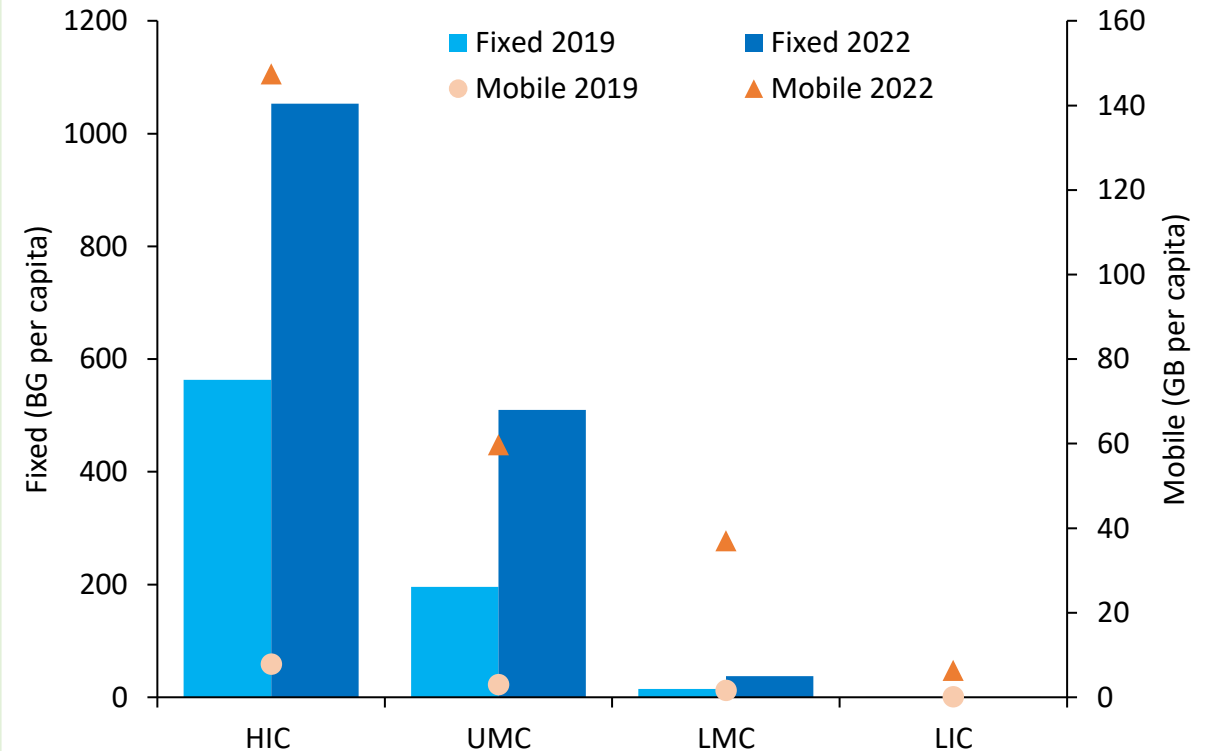
In 2022, median mobile broadband traffic per capita in HICs was more than **20 times** higher than that in LICs, and median fixed broadband traffic per capita more than **1700 times higher**.

Median Internet speed



Source: Ookla

Median broadband traffic per capita

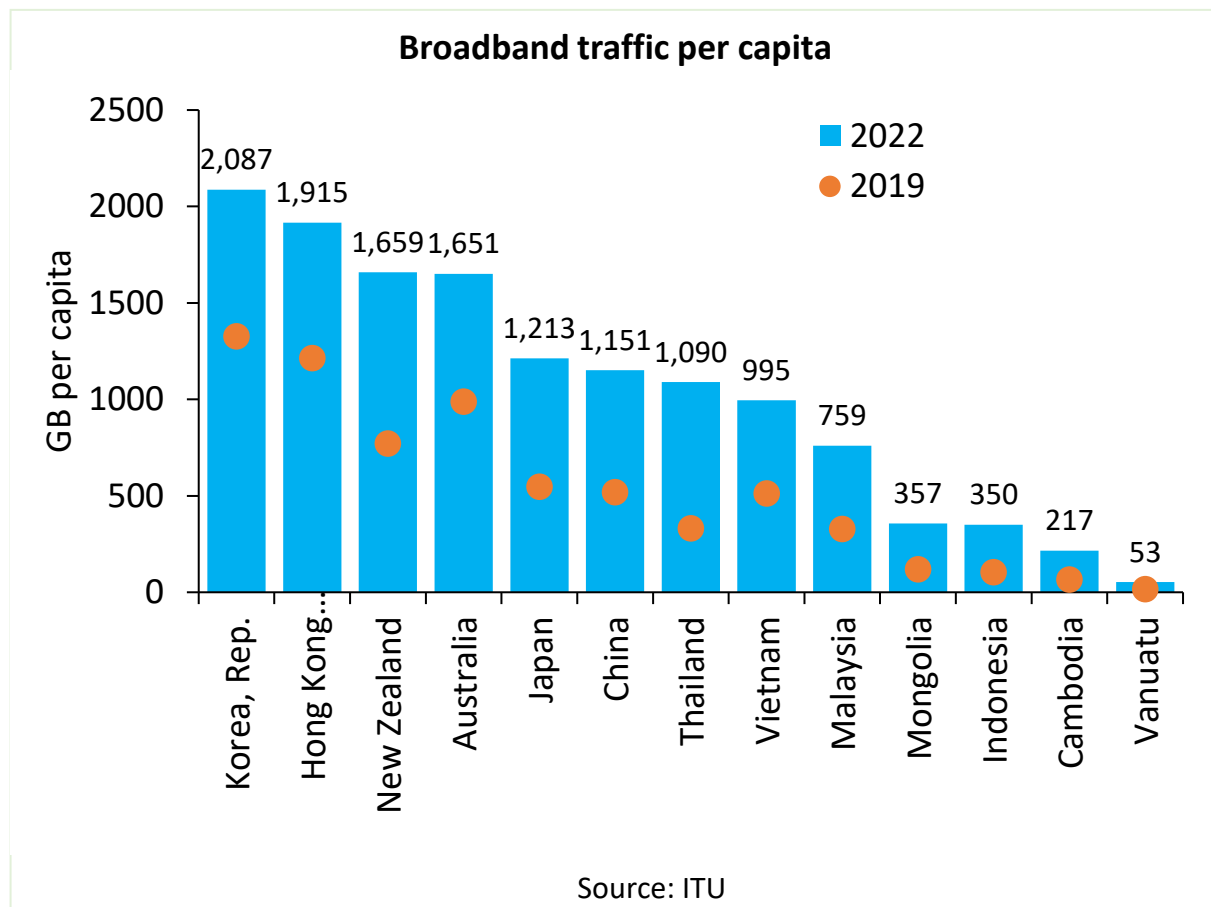
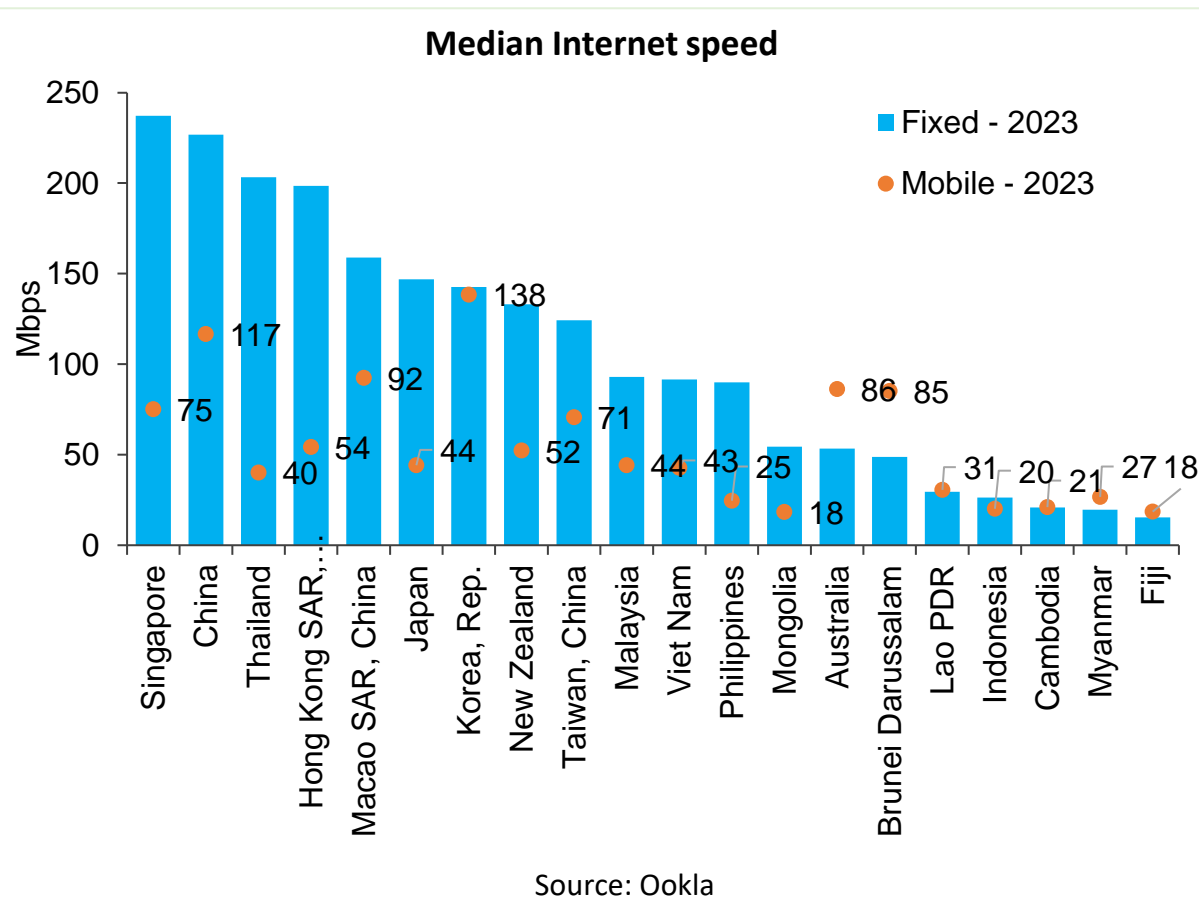


Source: ITU

Huge disparities in internet speed and data consumption across EAP countries: Internet speed and data traffic very low in Lao PDR, Indonesia, Cambodia, and Myanmar

In 2023, median fixed and mobile broadband speeds hover around **30 Mbps** in **Lao PDR, Indonesia, Cambodia, Myanmar and Fiji**, compared to 237 Mbps in Singapore.

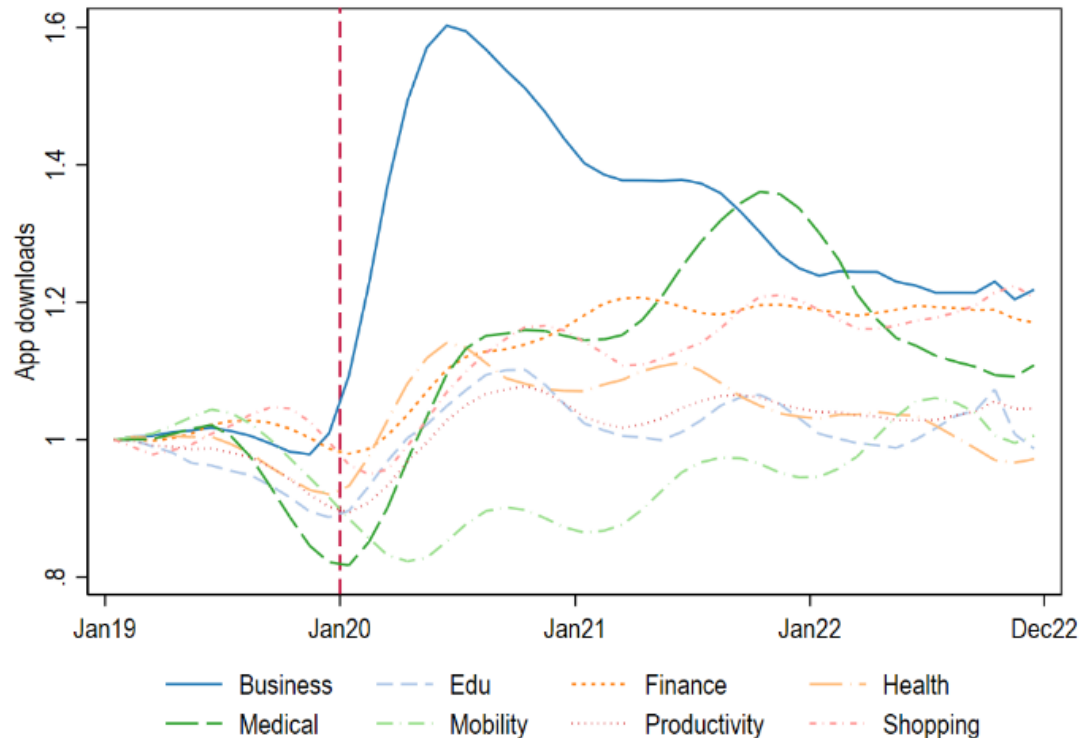
In 2022, data traffic per capita in Mongolia, Indonesia and Cambodia reached around **300 GB** per capita, **tripling** the level in 2019 but remain around **10-20%** the level observed in Korea and Hong Kong SAR.



The pandemic and mobility restrictions induced some durable changes in people's online behavior and accelerated digital payments and e-commerce adoption.

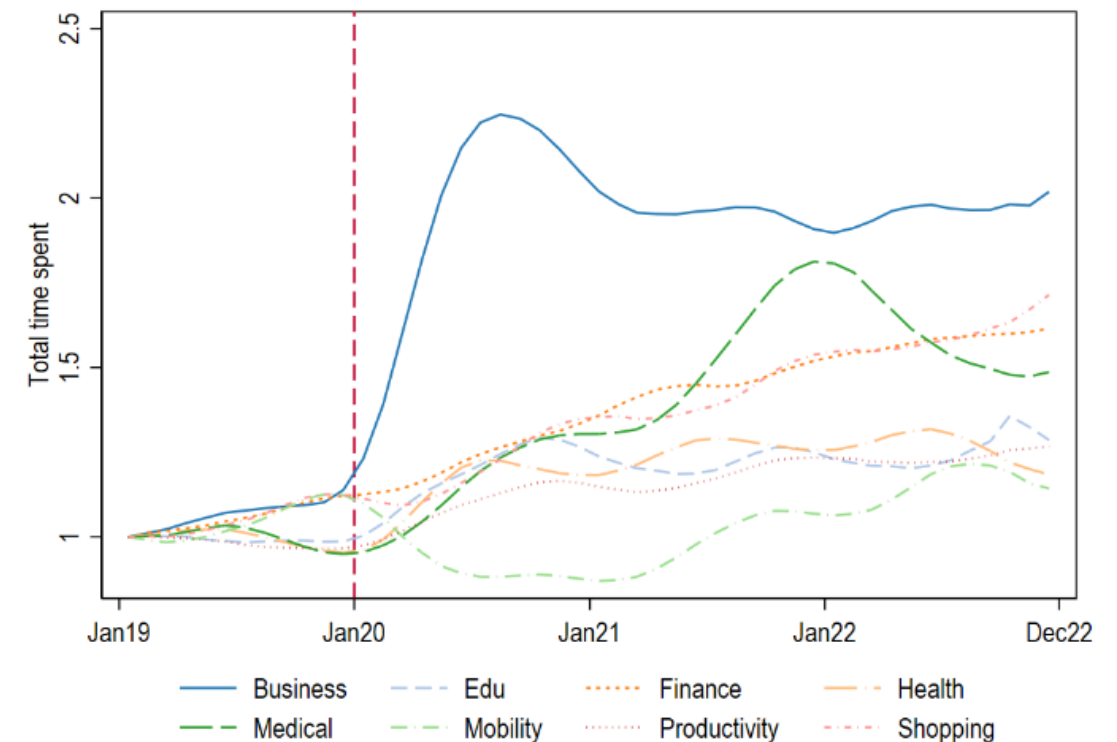
- The usage of business, education, finance, medical, health and shopping apps gained a significant boost due to mobility restrictions during the pandemic.
- The pandemic also induced a durable acceleration in digital payments and online shopping in many countries, as evidenced by the persistently high downloads of these apps.

Total downloads by app category



Source: Authors' calculations based on Apptopia data

Total time spent by app category



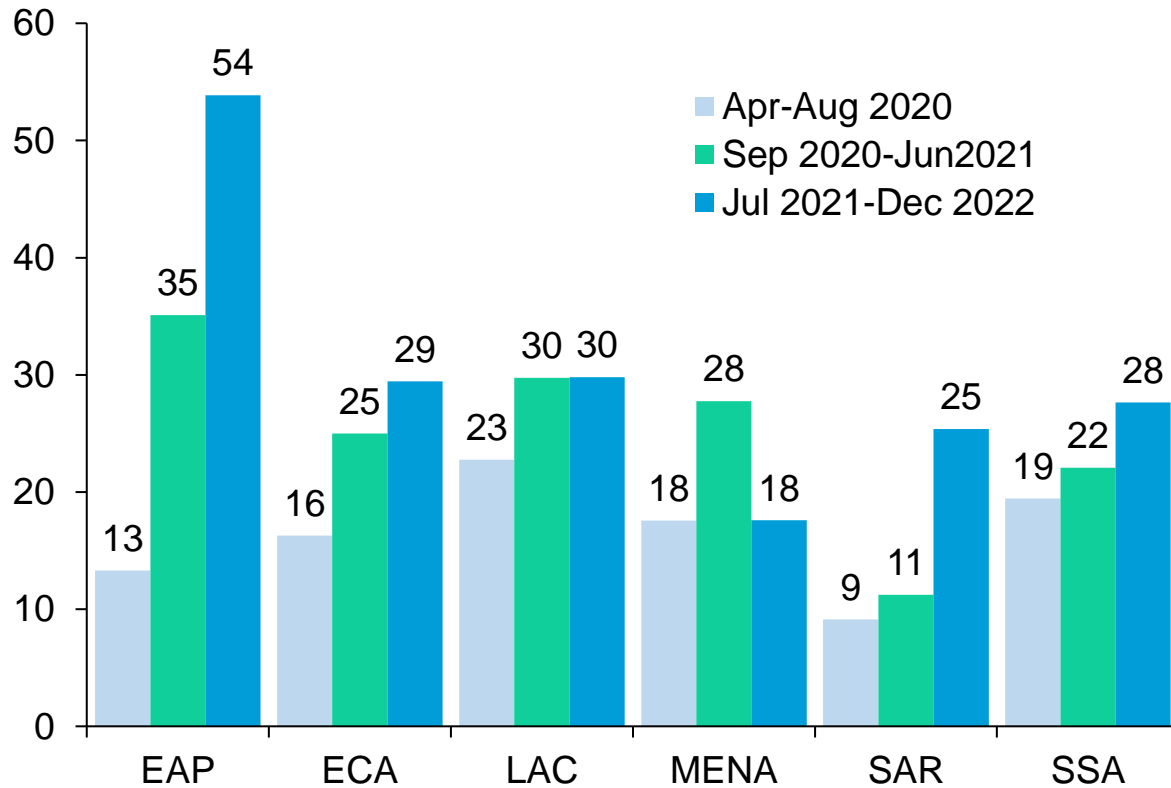
Source: Authors' calculations based on Apptopia data

Firms with greater digital readiness pre-pandemic and those that invested in digital solutions during the pandemic showed greater resilience.

EAP leads among developing regions in digital solutions investment in the period 2020-2022, **quadrupling** to **54%**.

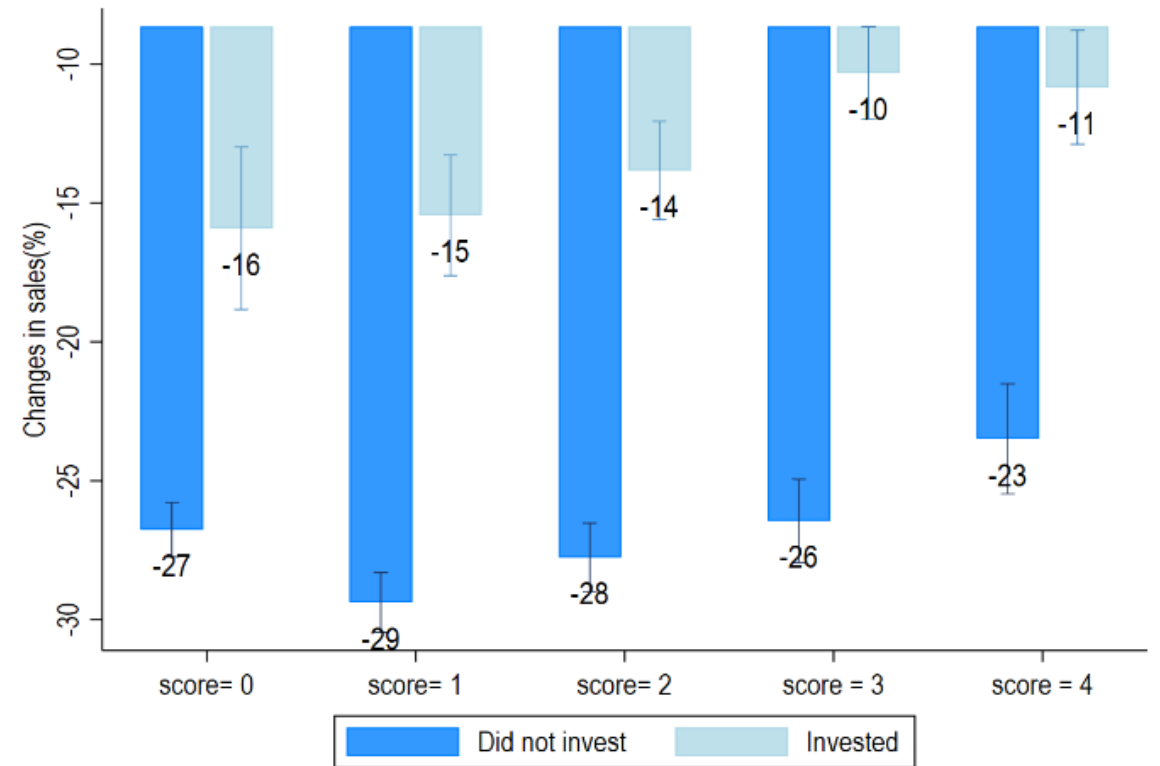
Firms that invested in digital solutions experienced only **half the drop** in sales than firms that did not invest.

Share of firms investing in digital solutions during COVID-19



Source: World Bank BPS data

Digital adoption improves firms' resilience in sales



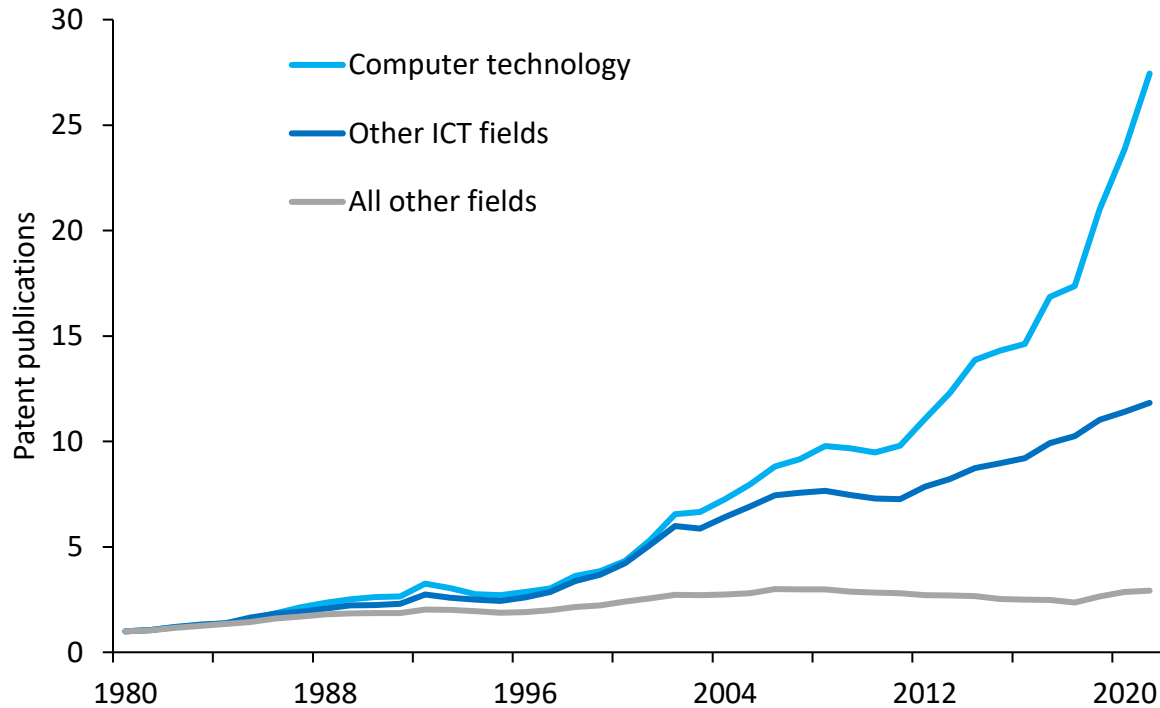
Source: World Bank BPS data

The digital sector is driving innovation, economic growth, and job creation, generating positive spillovers on the broader economy.

ICT-related technology fields accounted for more than **a quarter of** global patent publications in 2021.

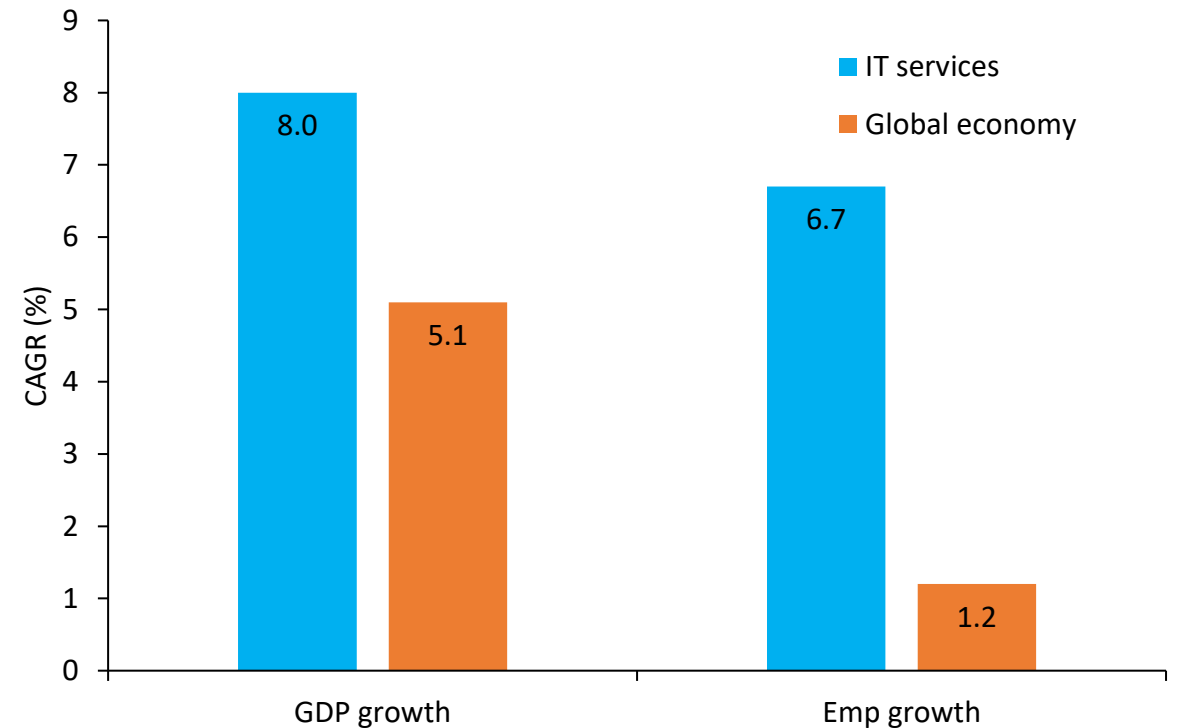
Compound annual growth rate (CAGR) of global value-added and employment for IT services reached **8 percent and 6.7 percent** during 2000-2022, which far outstrips the **5.1 percent and 1.2 percent** of the global economy.

Patent publication in ICT and other fields



Source: WIPO

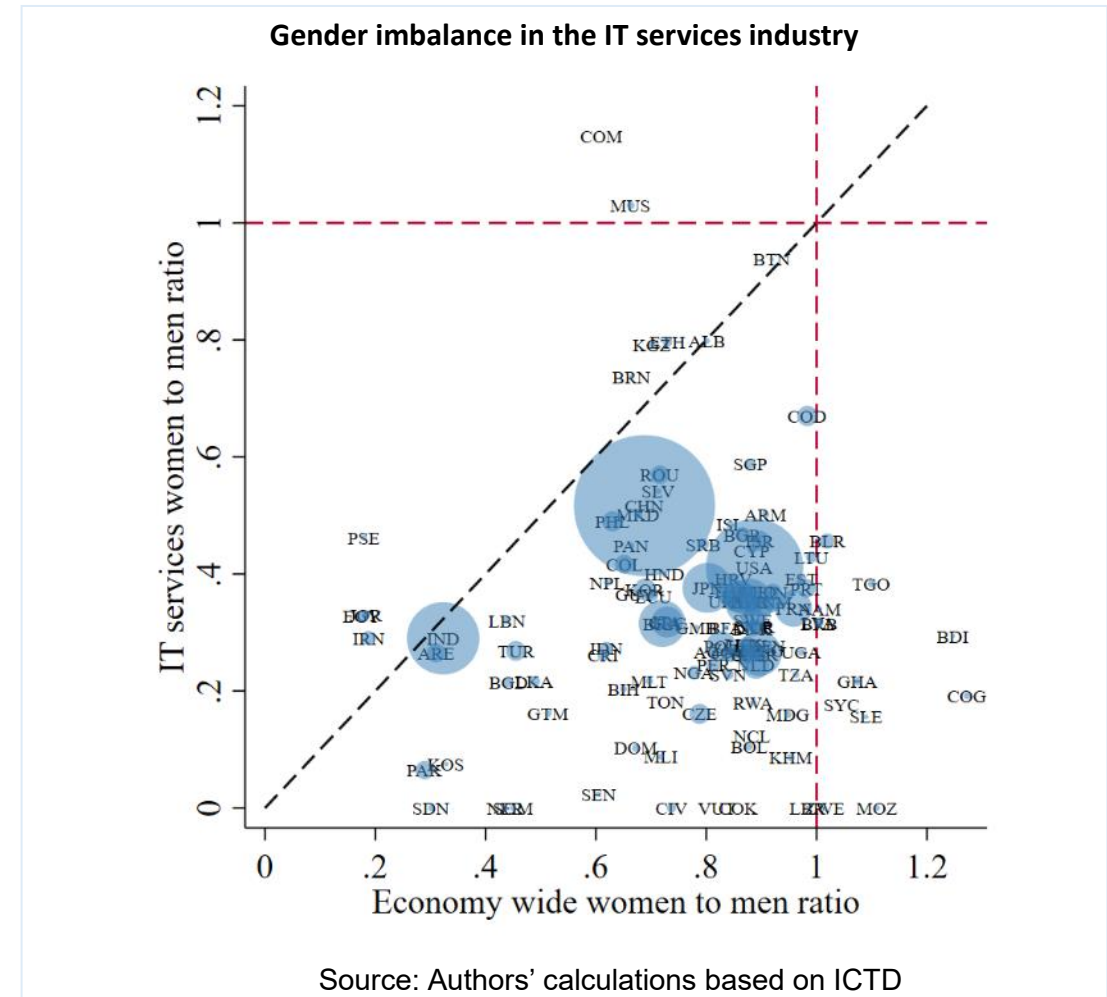
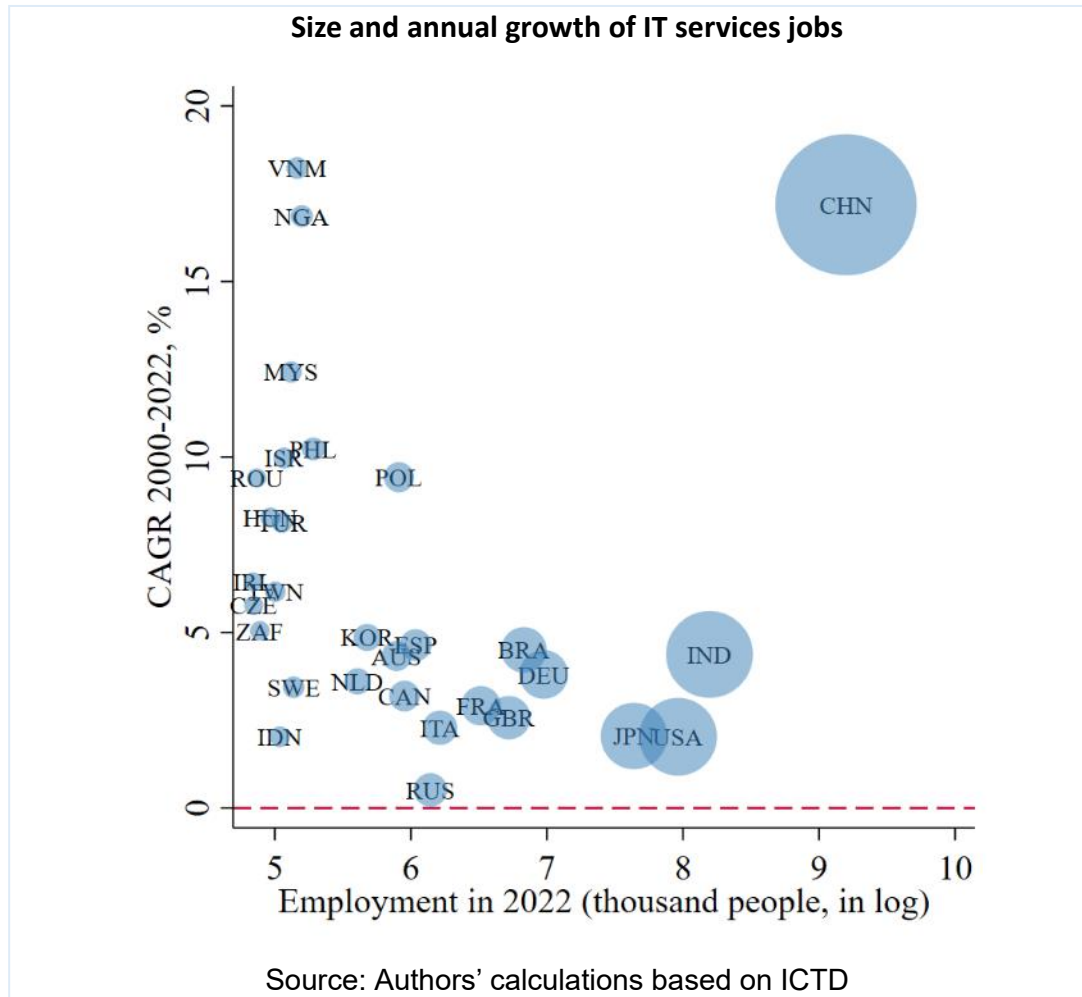
IT services GDP and employment growth, 2000-2022



Source: World Bank ICTD

Most countries experienced robust job creation in IT services. While women are still underrepresented, the gender gaps has narrowed over the past decade.

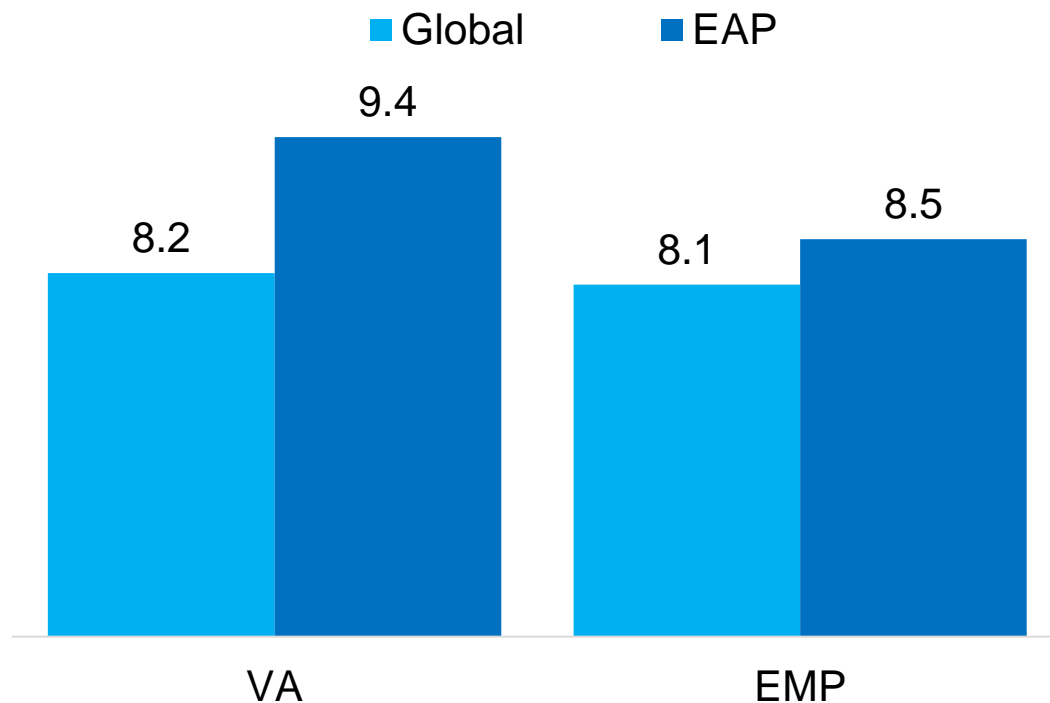
- Global employment in IT services has quadrupled from **8 million** in 2000 to **32 million** in 2022.
- Women made up **29 percent** of total employment in the male-dominated IT services industry in 2020, up from **23 percent** in 2010.



The IT services sector in the EAP region has experienced significant growth, despite a persisting gender gap in employment.

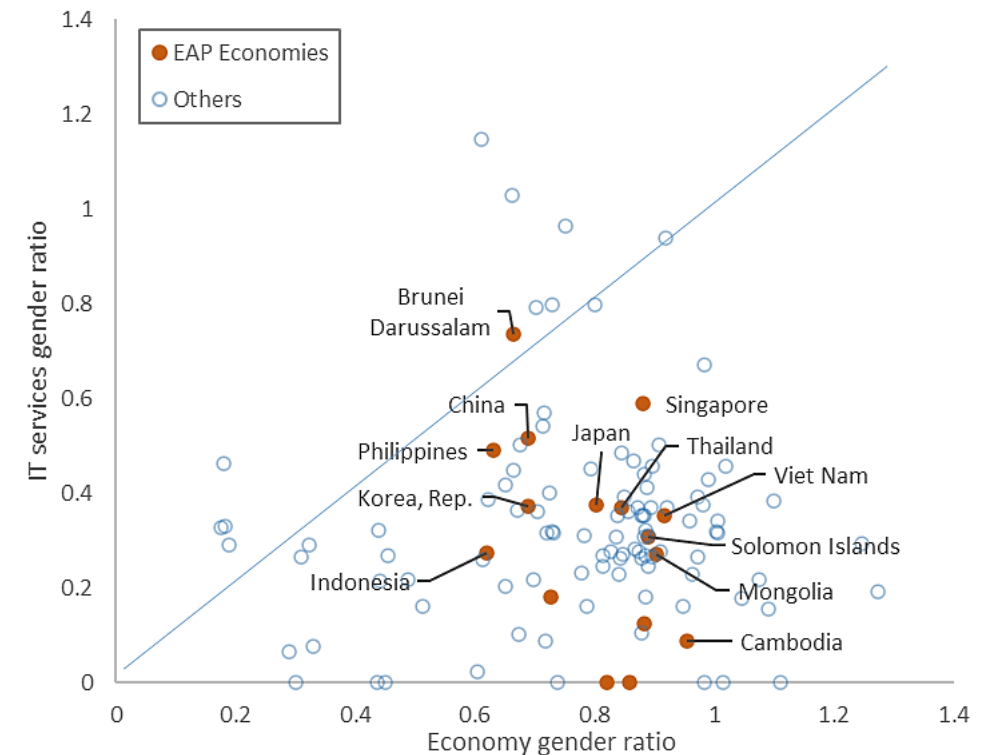
- The IT services sector in EAP (including HICs) grew by 9.4% in value added and 8.5% in employment from 2015 to 2022, outpacing global growth rates.
- Vietnam has become a key IT services hub in Southeast Asia, with IT employment growing annually by 20% over the last two decades.
- The gender gap in EAP's IT sector is narrowing, although disparities remain, especially in Southeast Asia.
- Proportionally more women in the Philippines and China work in IT services, nearly aligning with their overall economic participation rate.

IT services sector growth, EAP vs. World, 2015-22 CAGR



Note: VA = value added. EMP = employment. EAP includes HICs. CAGR = compound annual growth rate.

Gender imbalance in IT services sector, 2021



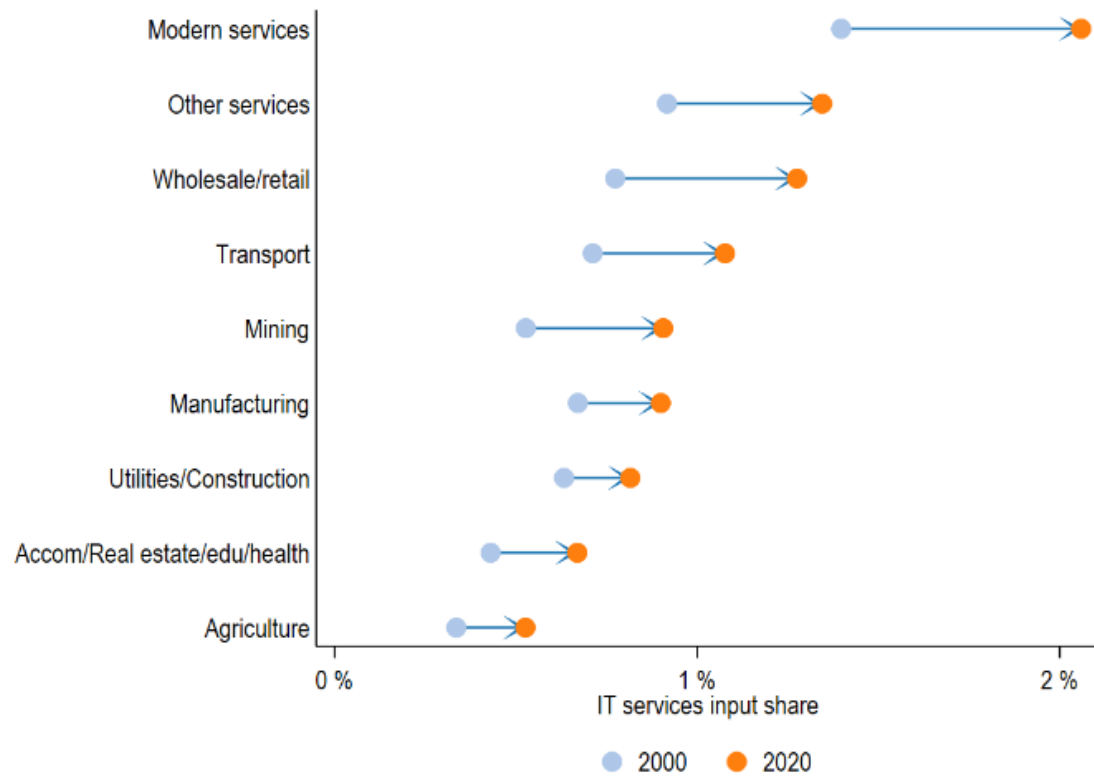
Note: Gender ratio is the ratio of female to male employees.

IT services are also increasingly used as intermediate inputs in other sectors, but they remain largely unexploited in lower-income countries.

From 2000 to 2020, IT services contributed to a much higher share of total intermediate inputs across all sectors.

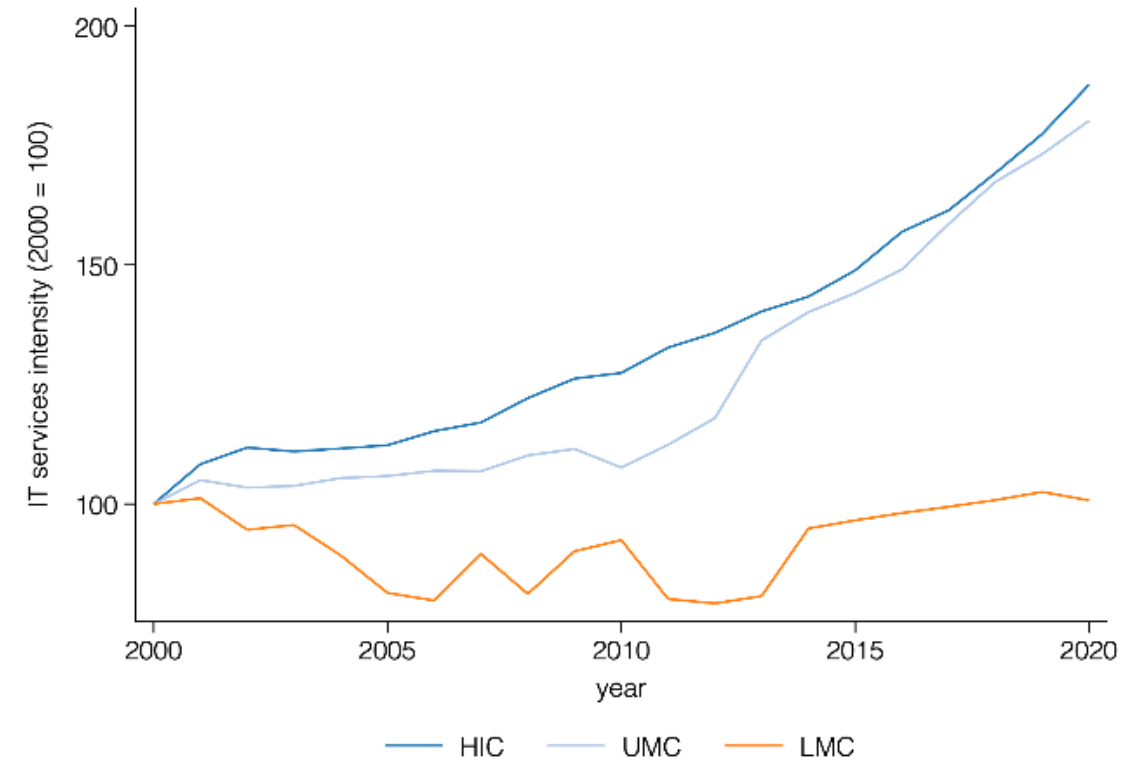
IT services input intensity almost **doubled in HICs and UMCs** during 2000-2020, but it **did not grow at all in LMCs**.

IT services input intensity by sector



Source: Authors' calculation based on TiVA (2022).

IT services input intensity by income group



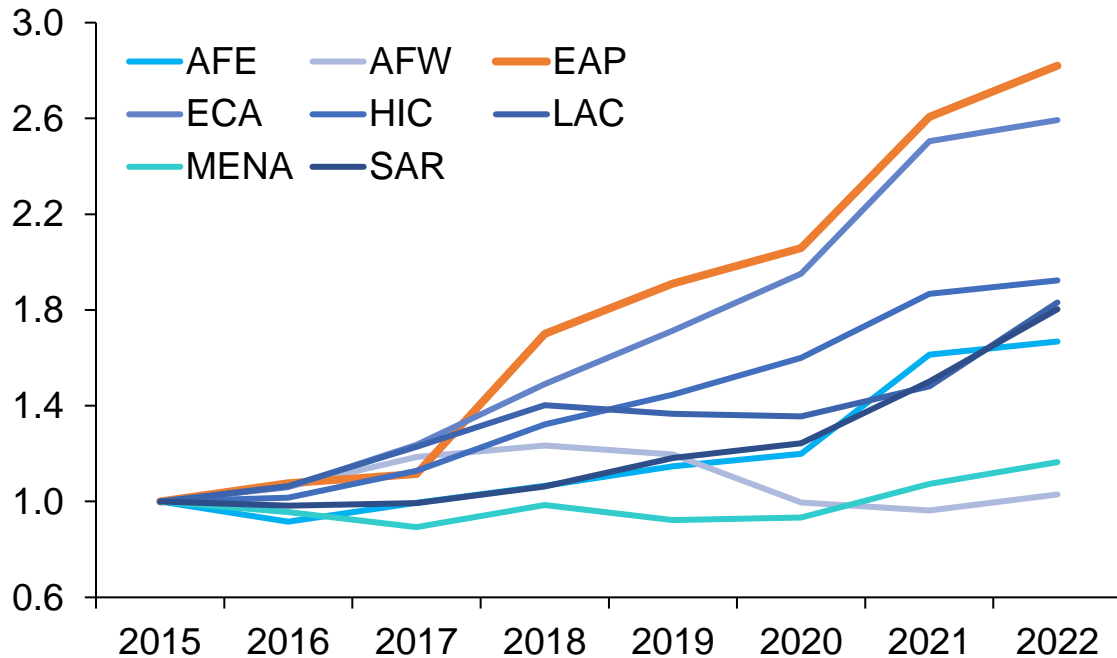
Source: Authors' calculation based on TiVA (2022).

IT and IT-enabled services has created a new export-led growth pathway for countries to expand and diversify their economies.

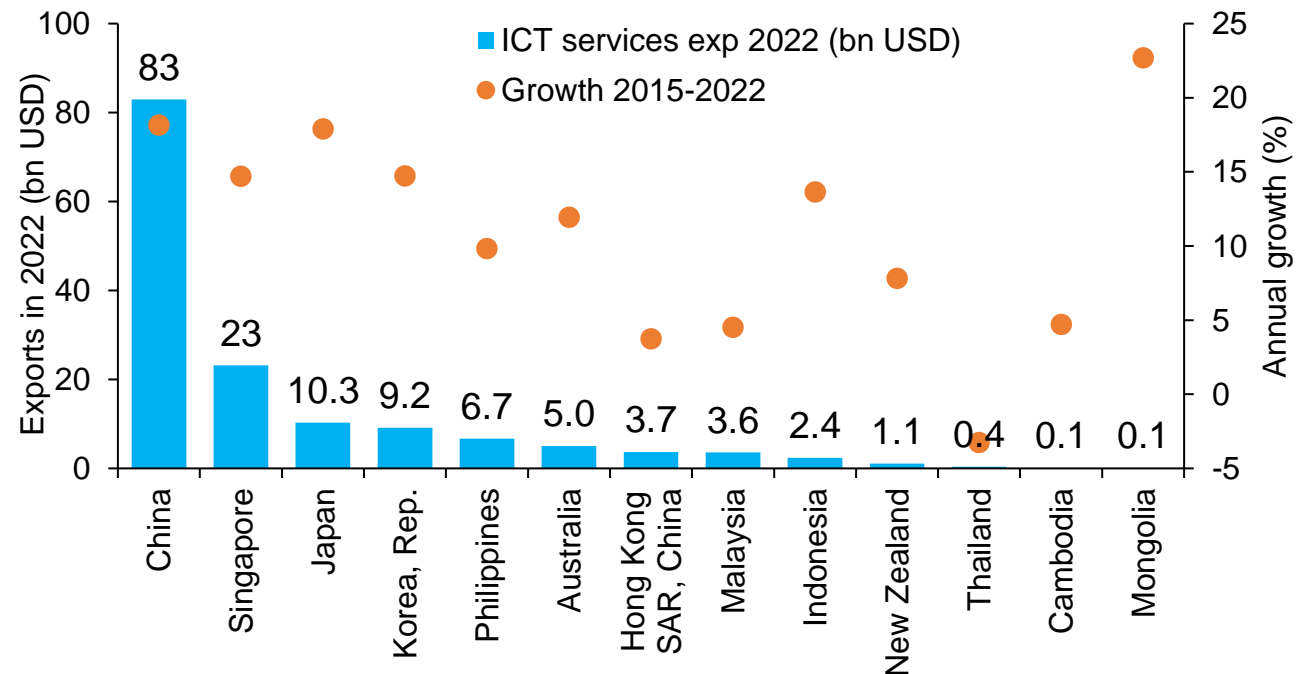
- Globally, during 2015-2022, IT services grew by **12%** annually, surpassing all other service categories. By 2022, IT services segment has become the **third largest** services exports category, right after transport and travel.
- EAP region (excluding HICs) achieved the fastest growth, ICT services exports nearly **tripled**, driven by strong growth (**18%** annually) in **China**.
- The Philippines has emerged as a leading exporter within Southeast Asia's middle-income economies, with its ICT services exports reaching **\$6.7 billion** in 2022, far ahead of its regional counterparts and at an impressive **10%** growth rate. Indonesia also recorded robust growth, albeit from lower base.

Booming IT services exports

a) Growth by region



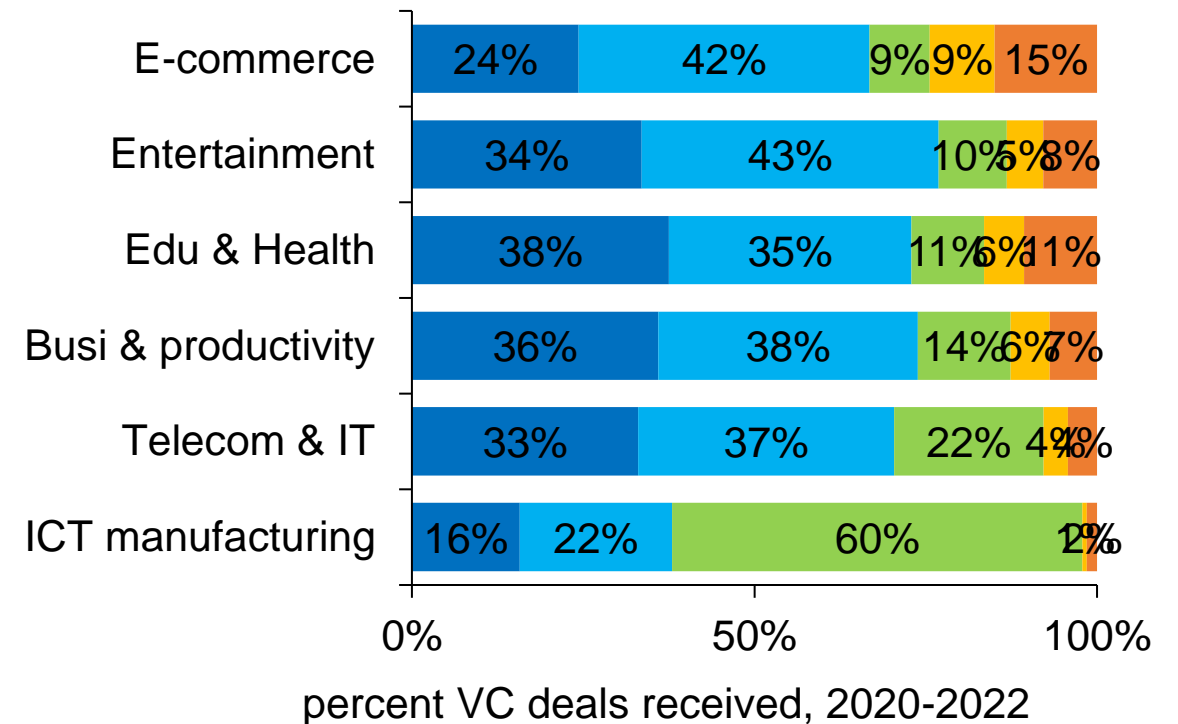
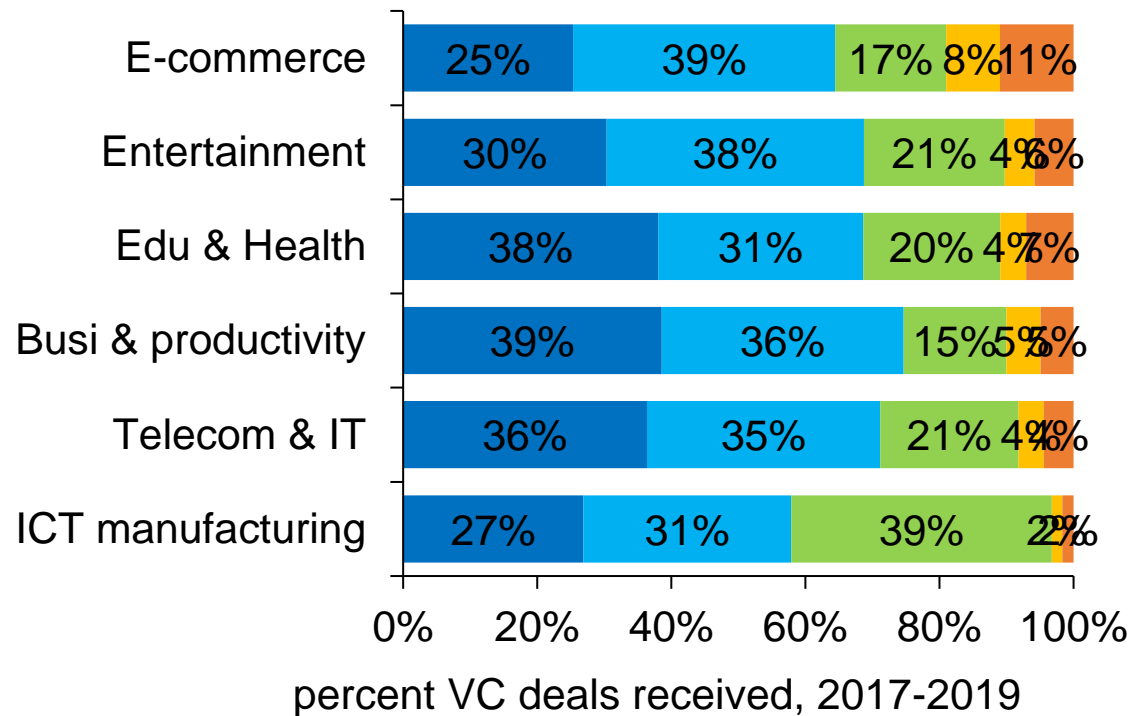
b) ICT services exports and growth



Digital startups in developing countries are also thriving, receiving an influx of venture capital funding during 2020-22.

- Total VC deals and funding received by digital startups in developing countries **doubled** from 2020 to 2021, though deals declined by 5% and funding halved in 2022.
- Digital unicorn birth hit an unprecedented **470 companies** in 2021, breaking the most recent record of **90** in 2020.
- Most VC deals in developing countries concentrate in e-commerce, fintech, health and education platforms, and entertainment

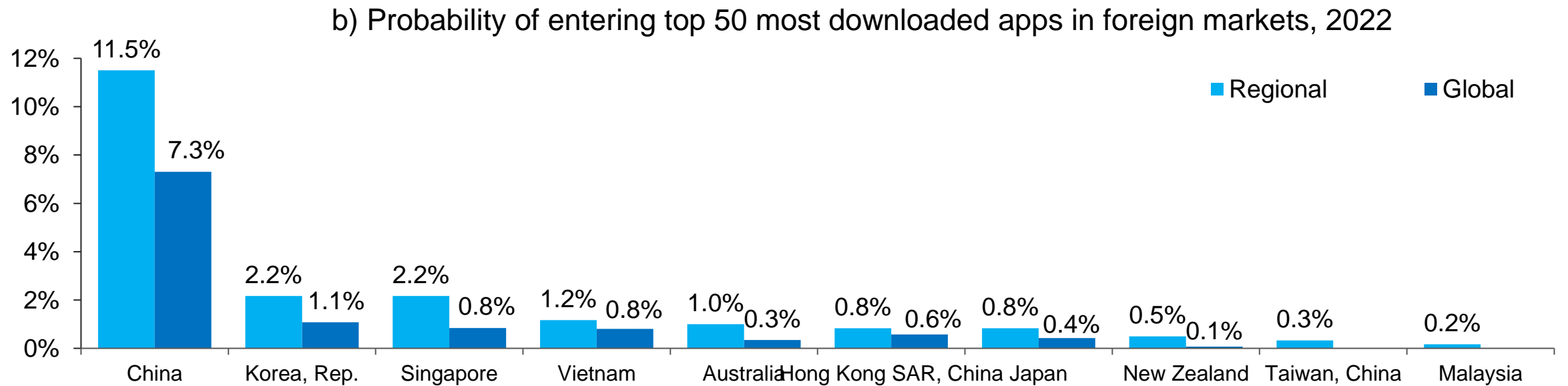
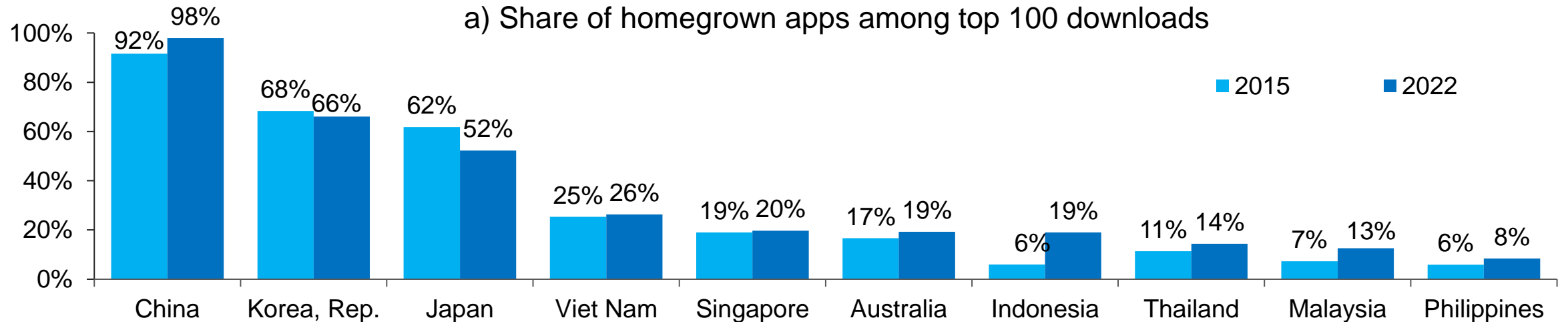
Share of venture capital investment deals received by country income group and digital segments



■ USA ■ Other HIC ■ CHN ■ Other UMC ■ LMC

■ USA ■ Other HIC ■ CHN ■ Other UMC ■ LMC

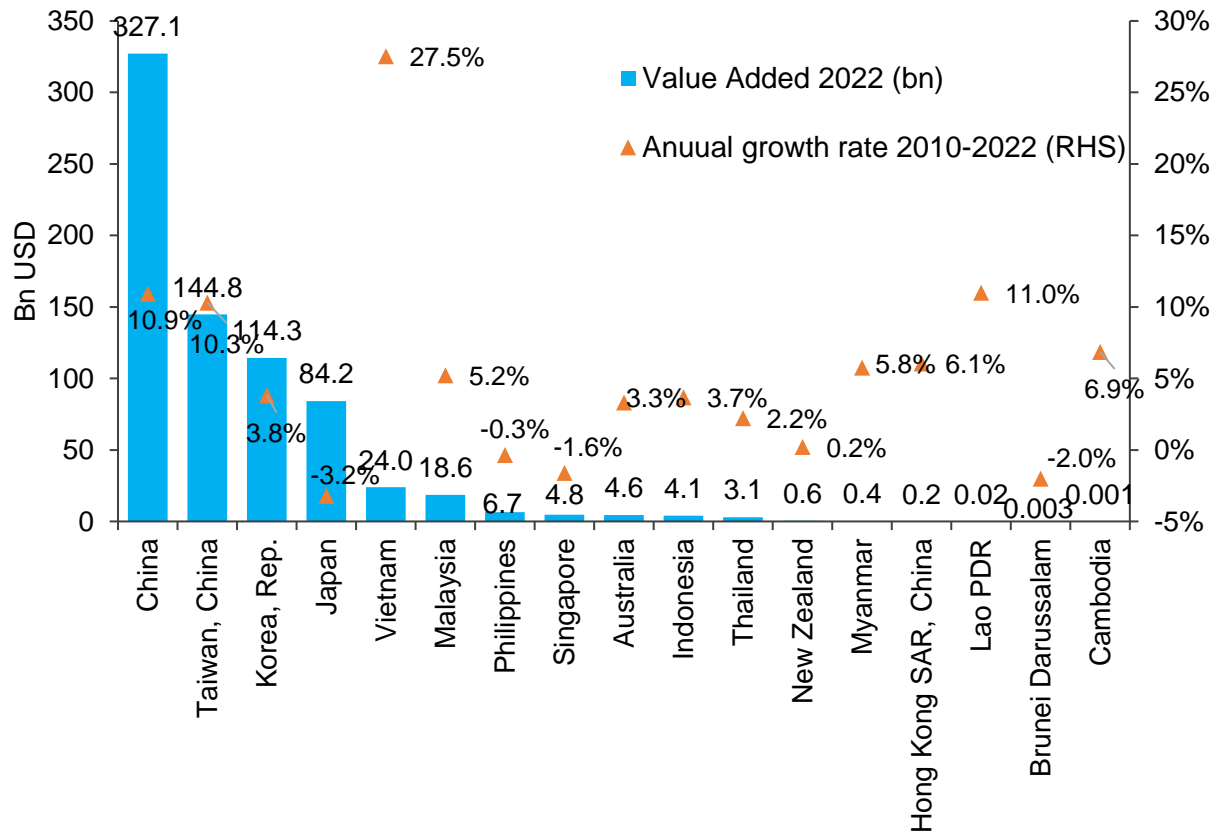
Digital startups in EAP are not only gaining momentum in their home markets but increasingly competitive in foreign markets



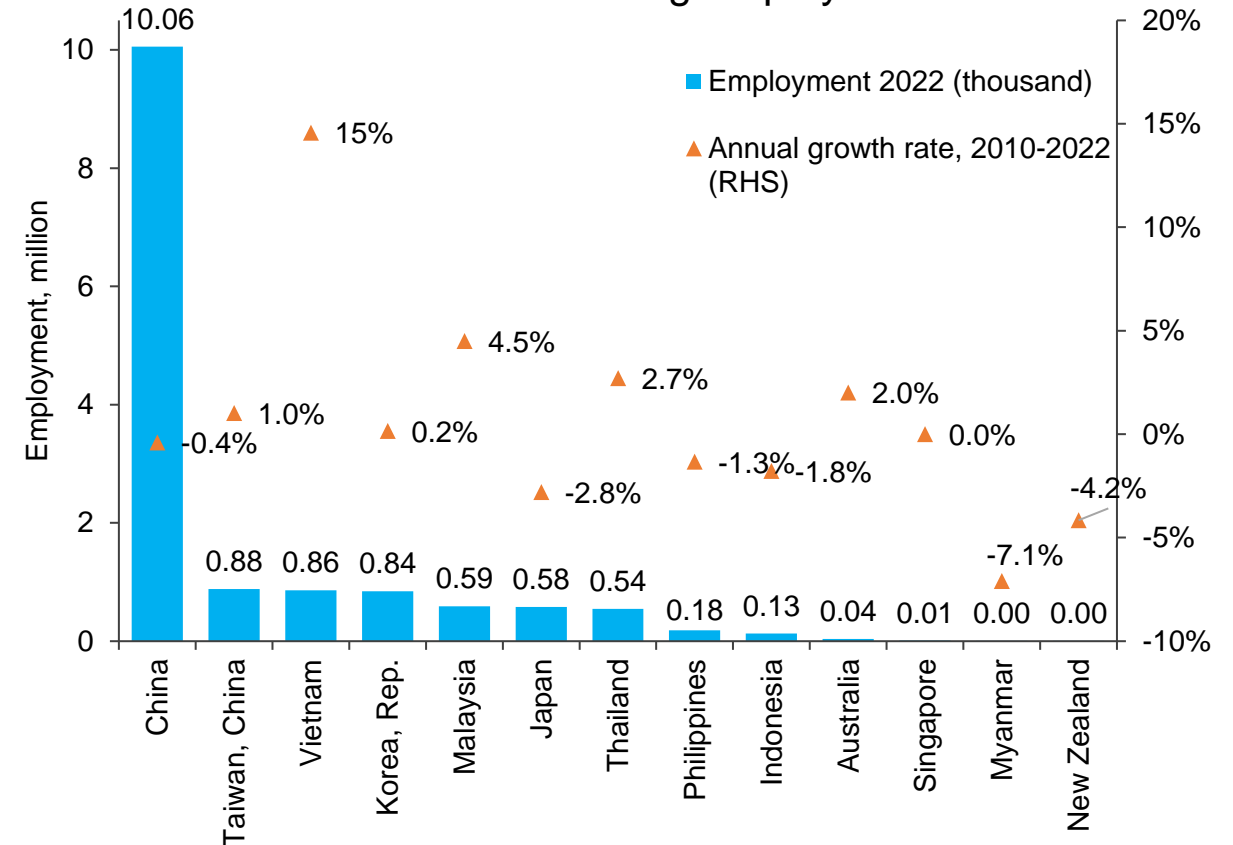
Vietnam became the biggest winner in GVC diversification and recording blistering value added and employment growth.

- The EAP region dominates in ICT manufacturing, led by China, Taiwan, China, Korea, and Japan. EAP region alone accounted for 60% of global value added and 75% of employment in ICT manufacturing in 2022.
- Vietnam sees significant progress in both value-added growth (27.5%) and employment growth (15%) in the ICT manufacturing sector between 2010 and 2022, becoming one of the favorite destinations for ICT manufacturing investment.

ICT manufacturing value added



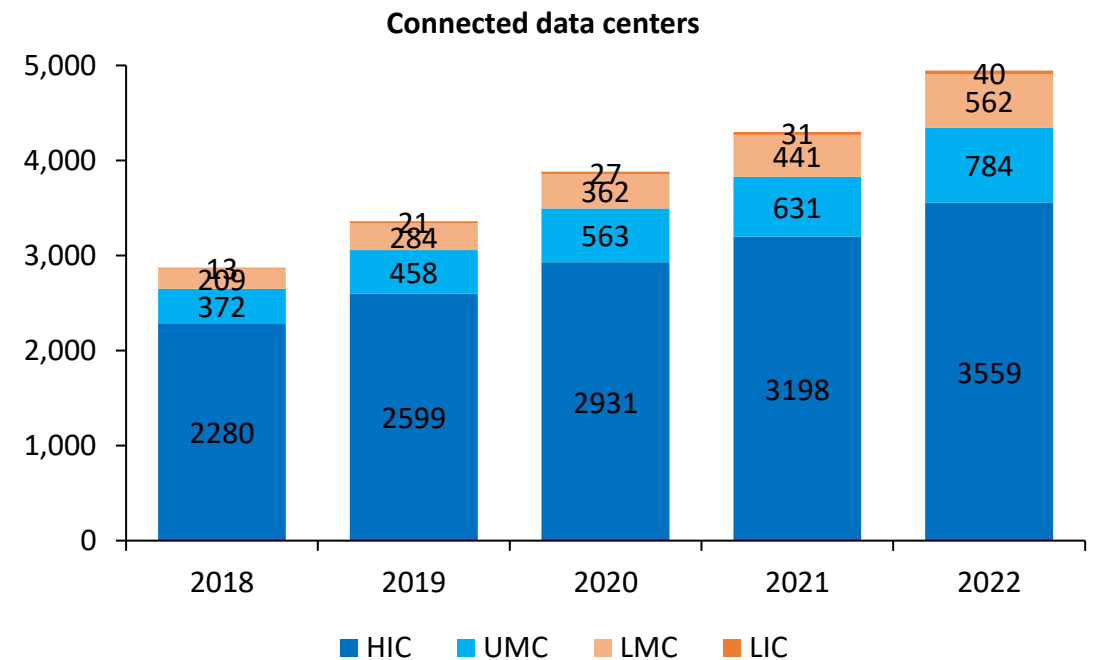
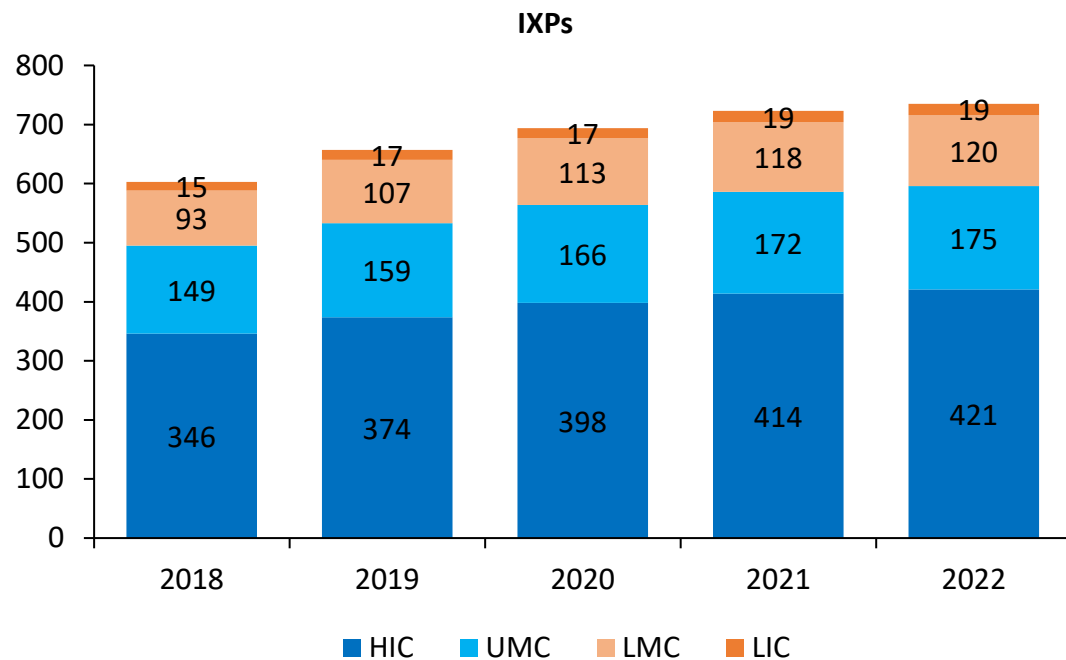
ICT manufacturing employment



Digitalization is happening alongside explosive growth in data and computing power. Developing countries need to invest in data infrastructure.

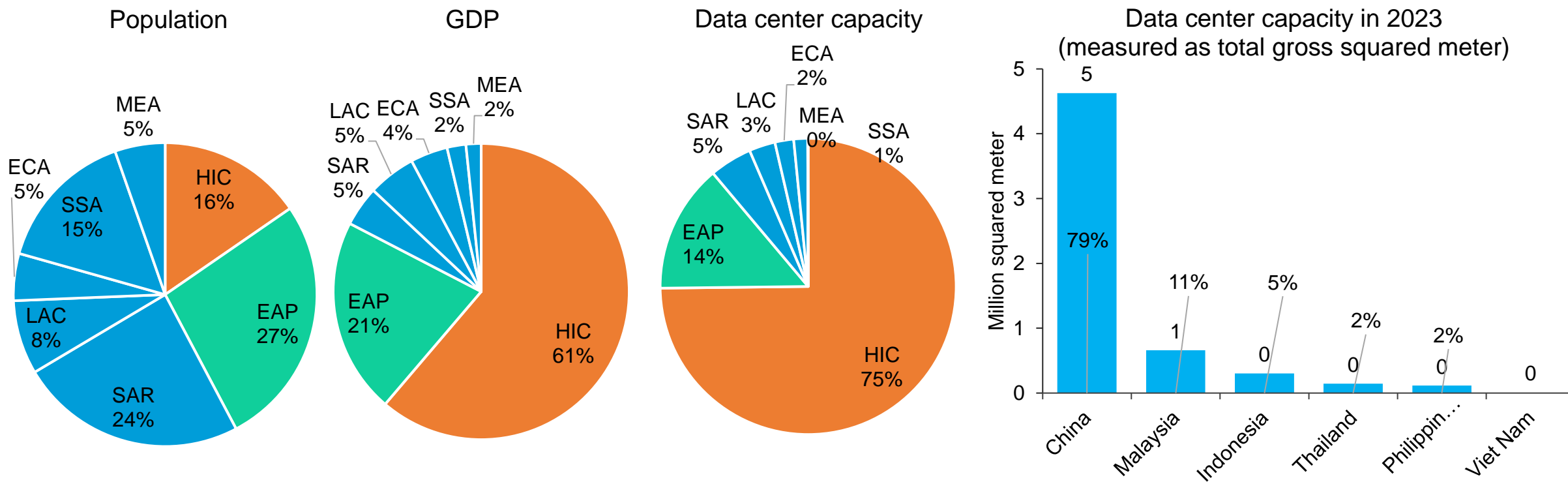
- The volume of data created, stored, transferred, and utilized globally has been growing exponentially from **2 zettabytes** in 2010 to an expected **120 zettabytes** in 2023, and is forecast to exceed **180 zettabytes** by 2025.
- Nearly **60%** of IXPs and **three-quarters** of connected data centers are located in HICs in 2022.

Number of IXPs and connected data centers by income group 2022



EAP region (excluding HICs) accounts for 27% of global population, 21% of GDP, yet only 14% of data center capacity.

- EAP region (excluding HICs) accounted for **27%** of global population, 21% of GDP, and **14%** of data center capacity in 2022.
- In HICs, there were **3.4** connected data centers per million population in 2022. In EAP, the ratio was only **0.39**, lower than ECA's 0.85.
- Excluding China, the rest of EAP economies, including Malaysia, Indonesia, Thailand, Philippines, and Viet Nam, only account for **21%** of data center capacity in developing EAP region

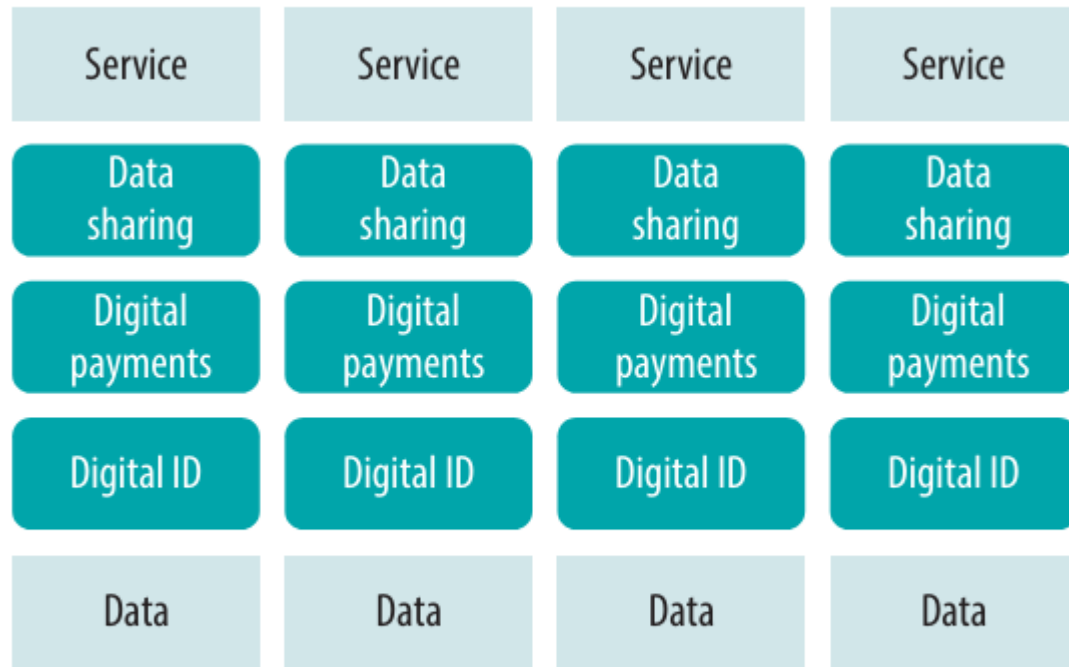


Source: PeeringDB and TeleGeography

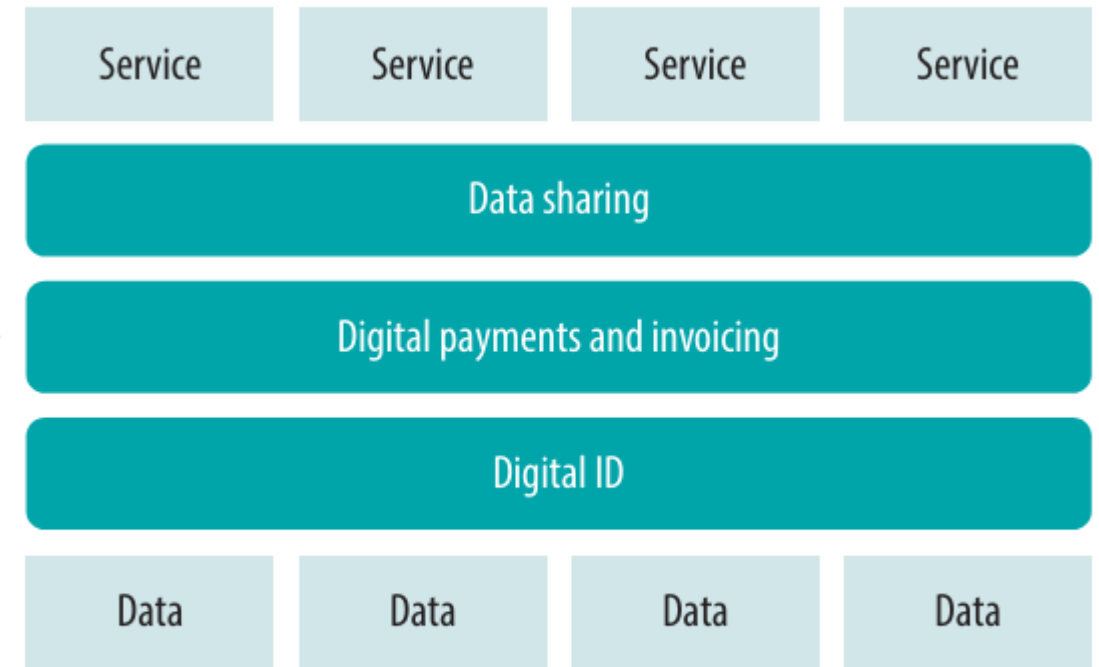
Digital Public Infrastructure represents a paradigm shift from siloed vertical approaches for digitalization to building cross-cutting horizontal enablers.

The DPI concept

a. Conventional approaches to digitalization



b. New approach to digitalization

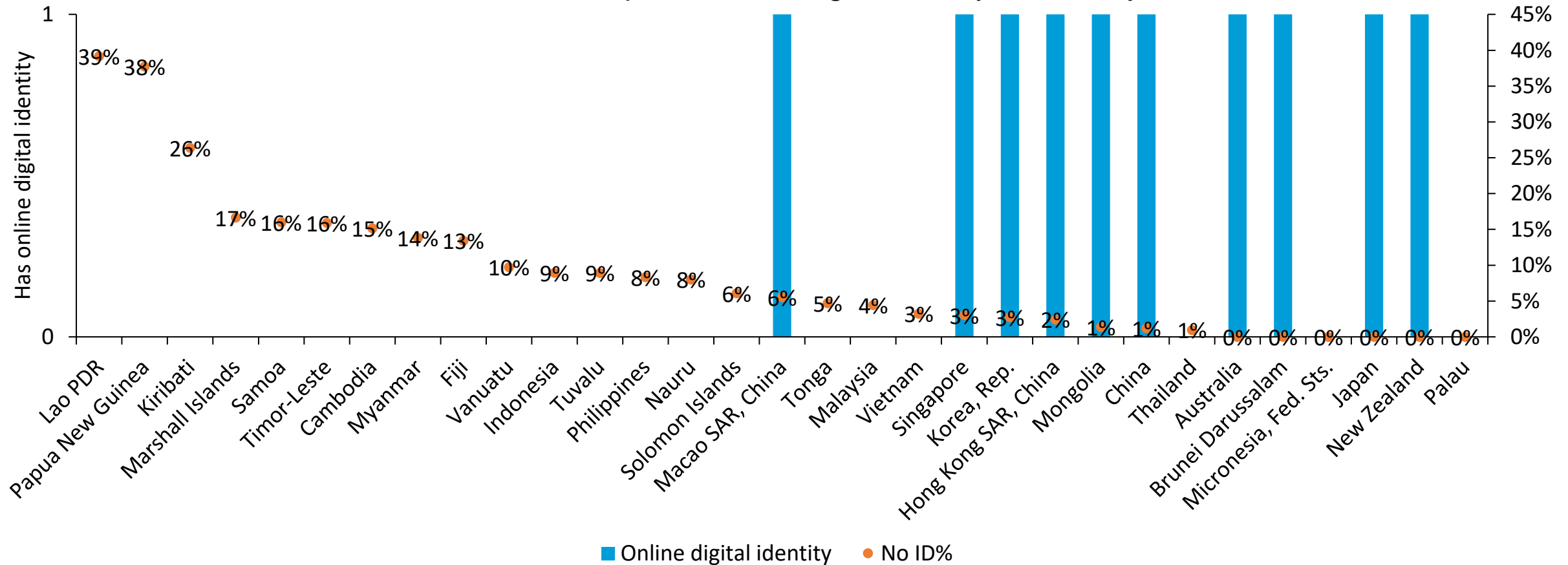


Source: World Bank.
Note: ID = identification.

Nearly 40% of population in Lao PDR and Papua New Guinea lack any formal ID. Most EAP nations, except for HICs, Mongolia and China, have yet to implement an online digital ID.

- Globally, 860 million people lack any form of official ID. Nearly 76 million of them are in EAP, representing 3% of the total population in EAP.
- Nearly 40% of population in Lao PDR and Papua New Guinea lack any formal ID. Many pacific islands, Cambodia, Myanmar also have >10% people without ID.
- Most EAP nations, except for HICs, China, and Mongolia, have yet to implement an online digital identity system.

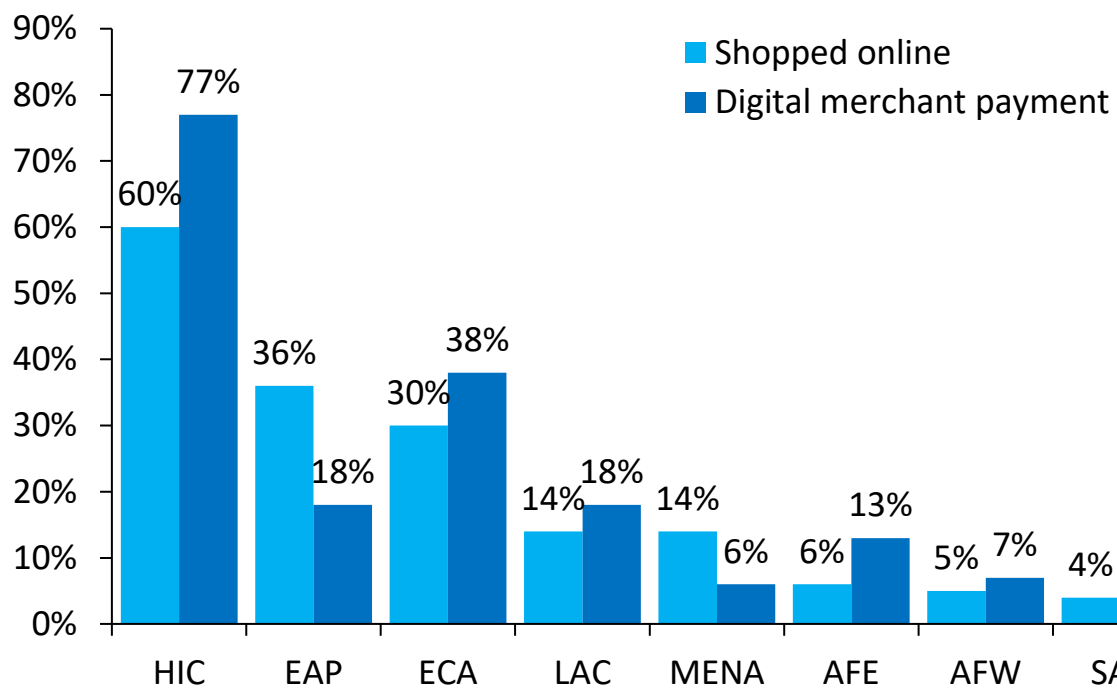
ID ownership and online digital identity availability



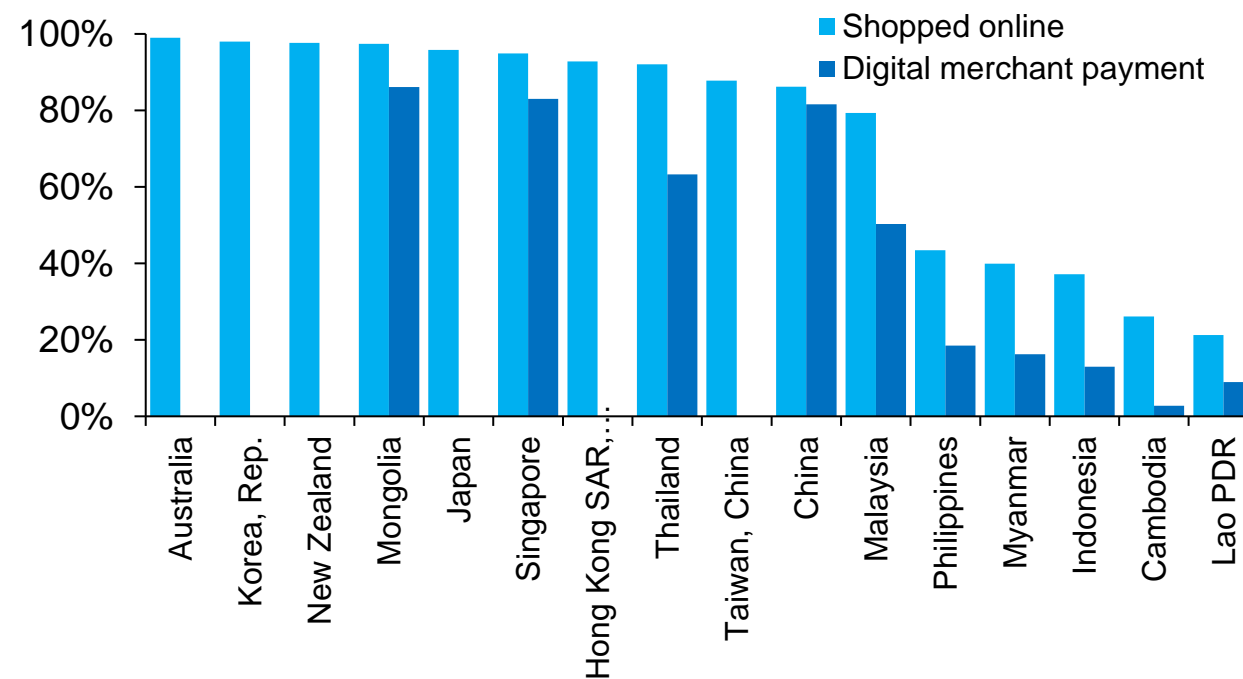
Digital payments and ecommerce are widely adopted in Mongolia, Thailand, China and Malaysia, but remain rare in Philippines, Myanmar, Indonesia, Cambodia and Lao PDR.

- **Mongolia, Thailand, and Malaysia** exceed **80%** in online shopping among non-high-income EAP economies.
- Opportunity for growth in digital payment systems in the **Philippines, Myanmar, Indonesia, Cambodia, and Lao PDR**, where online shopping was used by less than **50%** adults and digital merchant payments in less than **20%** adults.

Digital payments across regions, 2021



Digital payments in EAP, 2021



Note: Region names in the left figure refer to low- and middle-income economies in the region. All high-income economies are included in group "HIC".

Artificial Intelligence (AI) has huge potential to boost productivity growth, but they also present new risks and challenges, especially for developing countries.

Tackle Development Challenges

Boost productivity



New and better jobs



Increase consumer welfare



Accessible healthcare



Financial inclusion



Enhance resilience



Exacerbate Digital Divide and Inequality

Job automation



Widen inequality



Privacy and cybersecurity



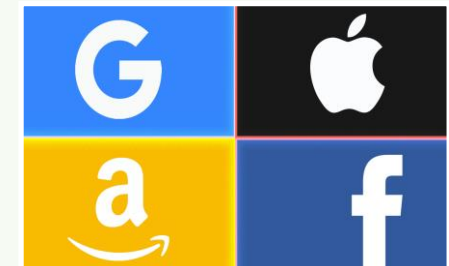
Algorithmic bias



Misinformation



Market concentration



Key Takeaways

While COVID-19 accelerated the adoption of digital technologies, digital divide continues to widen, exacerbating the poverty and productivity divide. Middle income countries are catching up with High-income countries, but Low-income countries are falling further behind.

The digital sector, especially IT-services sector, is driving innovation, growth, and job creation, generating positive spillovers on the broader economy. Soaring ICT-BPO services exports have allowed many developing countries to expand and diversify their economies. Homegrown digital firms are also springing up to cater to the domestic markets.

Unprecedented growth in data and analytical capabilities – including cloud and AI – is propelling digitalization to a new era. It highlights the urgency for developing countries to invest in high-quality broadband and data infrastructure, digital skills, inclusive data platforms/DPI, and carve out new development path to prepare for the disruption.

