World Investment Report 2025

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Chapter IV

International investment in the digital economy

United Nations

Key findings

- **The digital economy is the fastest-growing sector of the global economy, yet investment remains highly concentrated**
  Between 2020 and 2024, developing countries attracted more than $530 billion in greenfield digital economy projects, nearly 80 per cent of which went to just 10 countries.

- **MNEs are the main international investors in the digital economy**
  The United States remains home to the top investors, but South–South investment is growing.

- **Data centres and fintech have become major foci for investment, yet flows remain uneven across regions and sectors**
  Infrastructure investment needs are still unmet – Sub-Saharan Africa captures only about 5 per cent of the $14 billion it requires annually for bridging the connectivity divide.

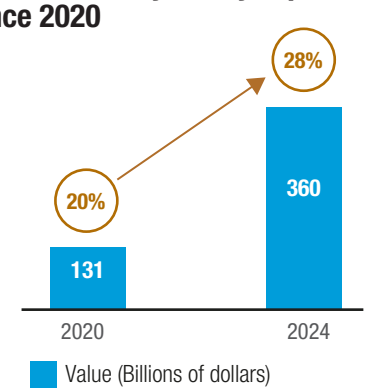
- **FDI can contribute to reducing the digital divide, but there are risks and the benefits are not automatic**
  Infrastructure, digital capacities and resources, market conditions and the regulatory framework all affect both the attraction and the impact of FDI in the digital economy.

- **Most developing countries now have national digital strategies**
  However, these are often not aligned with investment, industrial and environmental policies, and offer limited roles for IPAs.

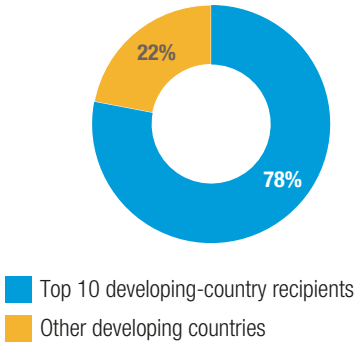
- **Regulatory gaps and FDI restrictions hamper investment in the digital economy**
  Data governance, intellectual property and competition frameworks need to be strengthened. International agreements can play an instrumental role in facilitating, promoting, liberalizing and regulating investment in the digital economy.

- **FDI in the digital economy should be not only transactional but also transformational**
  UNCTAD calls for a multi-stakeholder action agenda including policy toolkits, stronger international cooperation, investment in digital skills and infrastructure, and multilateral rules that reflect developing-country needs.

Greenfield investment in the digital economy nearly tripled since 2020



Most greenfield investment in the digital economy flows to 10 developing countries



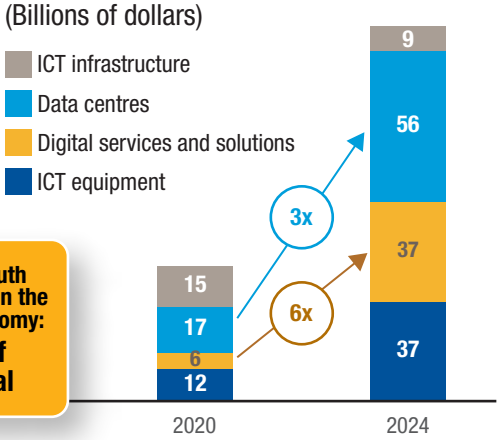
Investment gap persists in ICT infrastructure

$62 billion
annual need

2024 greenfield investment
$15 billion

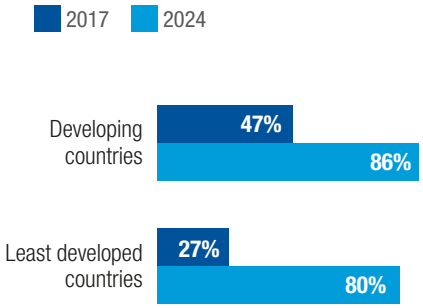
Data centres are now major investment targets in developing countries

(Billions of dollars)



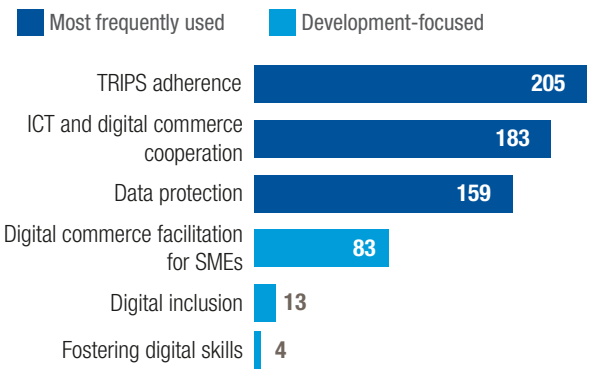
South–South investment in the digital economy:
40% of the total

Closing the gap: More developing countries adopt national digital strategies



Development-focused provisions are scarce in treaties regulating the digital economy

(Number of provisions)



A. Introduction

There is currently no universally agreed definition of the digital economy, complicating efforts to analyse international investment in this space. This section uses a three-tier framework – core, narrow and broad scopes – to better capture the expanding landscape of digital activities, which are growing rapidly in value and investment flows. The digital economy is a large component of the world economy and has become a main force driving global economic growth. It encompasses all activities that rely on digital technologies, from the creation to the consumption of digital and digitally enabled goods and services. With an expected annual growth rate of 10 to 12 per cent – significantly higher than the global rate of growth in gross domestic product (GDP) – the digital economy will represent more than two thirds of new value creation in the next decade.

While developed economies benefit from robust digital infrastructure and market access, many developing countries face critical challenges posed by limited infrastructure, connectivity and digital capabilities. In the new wave of digitalization driven by artificial intelligence (AI), big data and cloud computing, the digital divide has not narrowed but widened.

Bridging this divide requires significantly increasing investment in digital infrastructure and services, including by the private sector. Expanding digital networks, deploying fifth-generation (5G) broadband and investing in satellite technologies, for instance, all require substantial capital. The world faces an estimated $1.6 trillion gap in funding to achieve universal digital connectivity by 2030, with most acute needs in developing countries (ITU, 2025). Equally vital is investment in education and vocational training to build a digitally proficient workforce. International investment in the digital economy can help developing countries build digital infrastructure and access digital services.

Yet, as highlighted in the *World Investment Report 2017* (UNCTAD, 2017), international investment by multinational enterprises (MNEs) in the digital sector is associated with several risks, such as potential market dominance and regulatory challenges.

Since the publication of that report, digital technologies have continued to evolve, most recently with the spread of AI. These developments have heightened the rising demand for digital infrastructure, services and skills. In September 2024, the United Nations adopted the Global Digital Compact, which commits to closing the digital divide, expanding inclusive access to the digital economy, ensuring an open digital space in which rights are respected, advancing equitable data governance and strengthening international AI governance for the benefit of all humanity. A central element of the Compact is the call for increased investment and funding towards the development of digital public goods and infrastructure, particularly in developing countries.

The Compact advocates for investment in sustainable digital practices, including the development of green digital infrastructure and the promotion of digital solutions that support sustainable development.

Given the digital economy's evolving scope and cross-sectoral nature, defining it remains a challenge. Digital economic activities span everything from production of information and communication technology (ICT) goods and services to e-commerce and digital services, to the integration of advanced technologies in traditional industries. Complicating efforts to pin down a universal definition are the pace of innovation, the variety of digital capacities across countries and the interplay with disciplines such as law and economics. Therefore, definitions differ across economies and international organizations (box IV.1).

Box IV.1
Various perspectives on the scope of digital economy

The **Organisation for Economic Co-operation and Development** (OECD) considers the digital economy as encompassing all economic activities that rely on digital technologies. It places particular emphasis on the role of data as an economic asset, thus highlighting the transformative impact of digital platforms, e-commerce and innovation in shaping modern economies.

The **World Bank** takes a more development-focused approach, looking at how the digital economy drives inclusive growth, fosters poverty reduction and supports sustainable development. Its analysis often centres on the role of digital financial services, e-governance and infrastructure development in achieving these goals.

The **International Telecommunication Union** (ITU) regards the digital economy as the part of the economy empowered by telecommunications, digital data and digital technologies. It focuses particularly on connectivity and broadband access, emphasizing their critical roles as enablers of digital inclusion and economic participation.

The **European Union** considers the digital economy as encompassing all economic activities that rely on or are significantly enhanced by digital technologies, digital infrastructure, digital services and data. This includes the use of digital inputs in various sectors to drive innovation, productivity and economic growth.

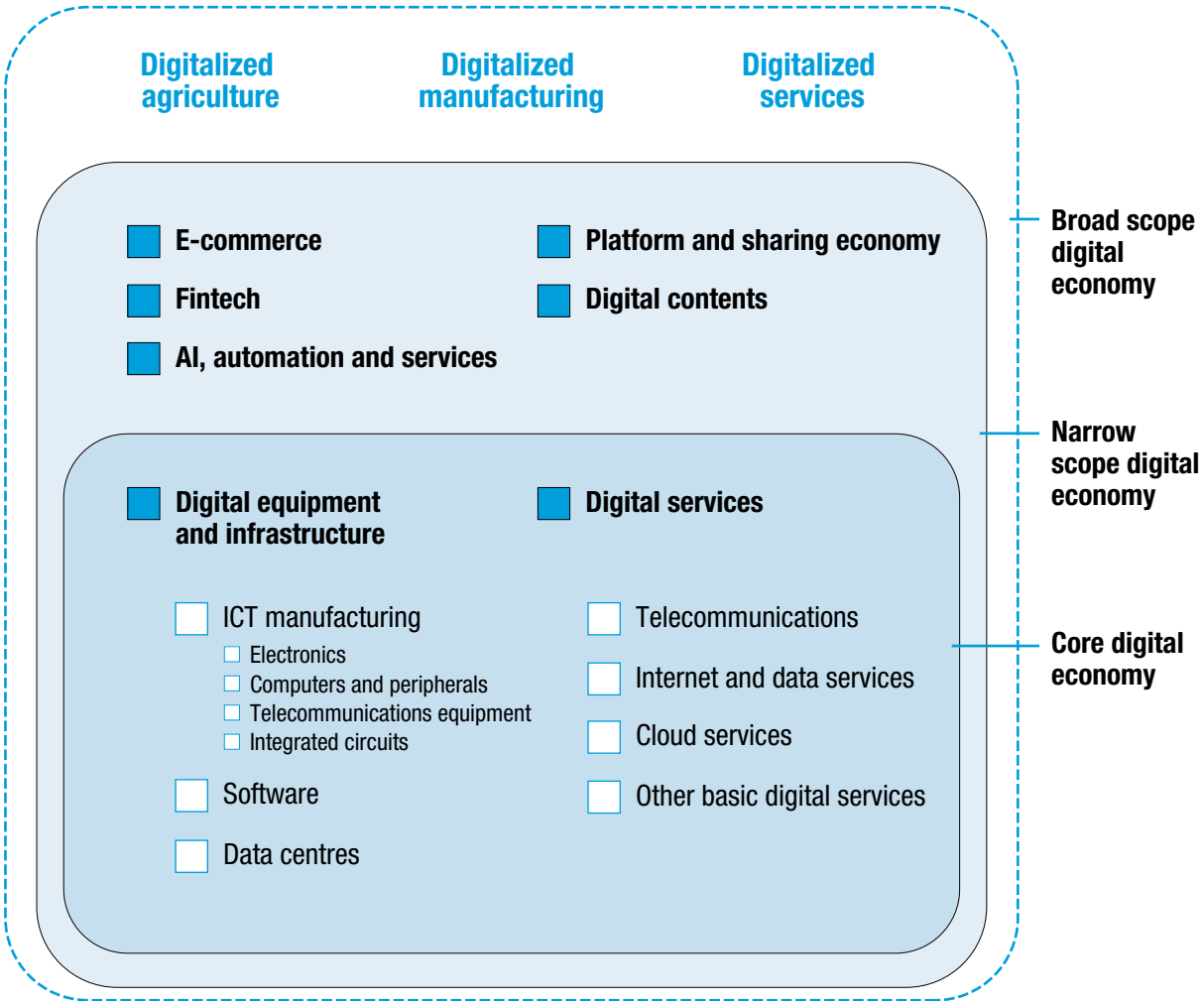
In the **Group of 20**, the approach to defining and measuring the digital economy centres on fostering inclusive and sustainable development. Under the 2025 presidency of South Africa, the Digital Economy Working Group plays a pivotal role in this effort, focusing on key priorities such as connectivity for inclusive digital development, digital public infrastructure and transformation, digital innovation ecosystems, and equitable, inclusive and just AI. The Group's work involves developing frameworks to guide the adoption of new technologies, optimizing their benefits while minimizing potential harm. By leveraging standardized indicators and methodologies, the Group of 20 aims to monitor and assess the digital economy's size, penetration and impact, providing policymakers with precise diagnostics for addressing challenges and opportunities. This comprehensive approach underscores the Group of 20's commitment to harnessing the transformative power of digital technologies for global economic and social reconstruction.

Source: UNCTAD, based on public information from OECD, the World Bank, ITU, the European Union and the Group of 20.

Understanding the structure of the digital economy is crucial for effective investment policymaking. In the *2017 World Investment Report*, UNCTAD defined the digital economy in terms of production, distribution and consumption of goods and services enabled by digital technologies. Following some scholars and other international organizations, in the *2019 Digital Economy Report*, UNCTAD identified three tiers to the economy: (1) the core ICT sector; (2) the narrow scope digital economy, including digital platforms and services and e-commerce; and (3) the broad scope, digitally transformed economy.

As technological advancements rapidly expand in range and complexity, the industrial classification of the digital economy continues to evolve. Recognizing the latest developments in this regard, the conceptual framework utilized in this chapter to analyse international investment in the digital economy also follows the three-tier approach (core, narrow and broad scopes), but with a revised set and structure of components (figure IV.1).

Figure IV.1
Mapping the digital economy for investment analysis



Source: UNCTAD, based on various sources.
Abbreviations: AI, artificial intelligence; ICT, information and communication technology.

The core digital economy consists of digital infrastructure (including ICT manufacturing, software and data centres) and digital services such as telecommunications, Internet and data services, and cloud services. The narrow scope digital economy comprises the core and builds on it by including platform-based activities, the sharing economy, e-commerce, fintech, AI automation and services. The broad scope digital economy encompasses the core and narrow scopes and expands to include digitally enabled sectors such as agriculture, manufacturing and services, where technology drives greater accessibility, better customer experience and improved efficiency. Unless otherwise specified, in this chapter the term "digital economy" refers to the narrow scope – in other words, the first two tiers.

At an average growth rate of 7 per cent, the value of the digital economy in its narrow scope is expected to reach $16.5 trillion by 2028 (ITU, 2025), owing primarily to investment in technology. This includes investment in digital infrastructure – such as data centres –- and cloud services, as well as ICT exports, which are major factors driving the expansion of the digital economy.

Recognizing the evolving and dynamic nature of the digital economy, this chapter presents an in-depth and updated analysis of international investment trends in the digital economy, including key players, challenges and opportunities. It also reviews recent developments in strategies, policies and initiatives for international investment in the digital economy at the national and international levels. This analysis and review lead to key recommendations for better leveraging international investment for inclusive and sustainable digital development.

B. International investment in the digital economy

The main international investors in the global digital economy are large MNEs, private equity and venture capital funds, and sovereign wealth funds. Driven by different motives and factors, these investors' activities continue to expand across borders, playing an increasingly significant role in the provision of digital infrastructure construction and services. Major digital MNEs originate not only from developed countries but also from emerging economies, actively fostering South–South investment in the digital economy. Through greenfield investment in data centres, fintech and other key digital industries, MNEs contribute to deepening digitalization, in both developed and developing countries. However, the benefits remain unevenly distributed, with lower-income developing countries still lagging.

1. Digital multinational enterprises and other key investors

The UNCTAD ranking of the top 100 MNEs has evolved significantly, reflecting shifts from traditional industries to service-oriented and technology-driven ones. Over the past decade or so, among the world's largest MNEs, technology firms have significantly increased their share of total sales and assets, including – in alphabetical order – Alphabet, Amazon, and Microsoft (all United States), Huawei and Tencent (both China) and Samsung (Republic of Korea). This shift highlights the growing importance of digitalization (see chapter I). The top 20 players in the global digital economy are almost exclusively companies from China and the United States (table IV.1).

MNEs operating in the digital economy can be categorized into two groups: digital enterprises and ICT enterprises. Digital MNEs are characterized by the central role of the Internet in their operating model, enabling them to reach overseas markets seamlessly with minimal tangible investment. ICT MNEs provide enabling infrastructure (telecommunications and connectivity) and hardware (devices and components) that makes telecommunications and data services accessible. For this report UNCTAD updated the top 100 digital MNEs list with new criteria to reflect the rise of rapidly emerging digital firms (box IV.2).

Table IV.1
Top 20 players in the digital economy: Digital and ICT enterprises
Rank by total sales

Company name	Home economy	Industry classification	Sales (Billions of dollars)		Assets (Billions of dollars)	
			Total	Foreign	Total	Foreign
Amazon.com	United States	E-commerce	573	155	528	138
Apple	United States	IT devices	383	245	353	84
Alphabet	United States	Platforms	307	161	402	104
Microsoft	United States	Digital solutions	212	105	412	160
Hon Hai Precision Industry	Taiwan Province of China	Semiconductors	201	197	128	119
Samsung Electronics	Republic of Korea	IT devices	200	165	352	79
JD.com	China	E-commerce	153	48	89	0
China Mobile	China	Telecommunications	143	5	281	12
Meta Platforms	United States	Platforms	135	85	230	37
Alibaba Group Holding	China	E-commerce	126	13	255	10
Deutsche Telekom	Germany	Telecommunications	124	95	320	258
AT&T	United States	Telecommunications	122	5	407	13
Comcast	United States	Telecommunications	122	27	265	49
Bytedance	China	Platforms	120	40	NA	NA
China Communications Construction	China	Telecommunications	107	16	237	37
Dell Technologies	United States	IT devices	102	53	90	30
Huawei	China	IT devices	99	33	178	98
Nippon Telegraph and Telephone	Japan	Telecommunications	99	21	191	85
Walt Disney	United States	Digital content	89	19	206	23
Tencent Holdings	China	Digital content	86	8	222	80

Source: UNCTAD, FDI/MNEs database.
Abbreviation: IT, information technology.
Note: Data on sales correspond to fiscal year 2023.

Box IV.2
Methodology for UNCTAD ranking of top MNEs in the digital economy

The data compilation for the 2025 ranking of digital MNEs began with screening large technology companies on the basis of activity codes, business descriptions and financial reporting to determine their core activities. The ranking focuses on primary business activities and foreign operations, assessed through criteria such as foreign sales and foreign assets. The 2025 ranking updates the methodology used in the *World Investment Report 2017* to include criteria such as involvement in foreign projects (greenfield project announcements, international project finance (IPF) deals or mergers and acquisitions (M&As)) and venture capital investment in foreign start-ups. These additional criteria help include relevant digital MNEs, especially private companies in emerging economies that provide limited financial information on their foreign operations.

Another methodological change relates to the relationship between digital and ICT MNEs. Technological advancements, especially in AI, have diversified and broadened the category of digital MNEs. In recent years, technology has shifted the revenue sources of digital MNEs from hardware to digital and cloud services. For example, IBM (United States) now derives more than 40 per cent of its revenues and 80 per cent of its profits from software and digital solutions, leveraging its hybrid cloud platform for data management and system automation. Likewise, through its network of apps Apple (United States) has created a digital ecosystem that drives much of its revenues.

This update also includes a new list of ICT MNEs, ranking all providers of tangible infrastructure, devices and components that form the core digital economy. All other multinational enterprises (MNEs that generate substantial revenue from digital services are included in the list of digital MNEs). In a limited number of cases, particularly among cloud-based service providers, firms appear in both rankings; examples are Apple and IBM. For the digital MNEs ranking, see annex table A.1 at the end of the chapter and for the ICT MNEs ranking, see annex table A.2.

Source: UNCTAD.

a. The 100 largest digital MNEs

Large digital multinational companies are major international investors in the global digital economy. The top 100 digital MNEs operate in four major segments of the digital economy, reflecting diverse business models:

1. **Digital platforms and services.** Includes social media, search engines and cloud services. Companies such as Alphabet and Meta (both United States) and ByteDance (China) dominate, leveraging platform-based models to connect billions of people. Rapid growth in advertising-driven platforms is led by widespread adoption of digital services.
2. **Digital solutions.** Encompasses enterprise software, ICT services and cybersecurity. Key players include IBM, Microsoft and Salesforce (all United States). Fast-growing segments are cloud-based solutions, AI applications and digital finance platforms, which enable seamless transactions and financial inclusion. These MNEs expand globally through innovation centres and alliances.

3. **E-commerce.** Includes giants such as Alibaba and JD.com (both China) and Amazon (United States), which have transformed retail and supply chains. Cross-border e-commerce and last-mile delivery are the fastest-growing segments, driven by global consumer markets. These MNEs invest in logistics, analytics and emerging technologies, providing small and medium-size enterprises (SMEs) in developing economies with access to international markets.
4. **Digital content.** Includes streaming services, gaming and digital publishing. Notable players are Netflix (United States), Spotify (Luxembourg) and Tencent (China), leveraging the growing consumer preference for readily accessible on-demand entertainment. Streaming platforms are the fastest-growing segment, driven by consumer preferences and content delivery advancements.

These categories highlight the multifaceted nature of digital MNEs. As the sector evolves, the distinctions between types of enterprises are becoming less clear, making it more challenging to categorize them (see annex table A.1). For example, Amazon, which initially had a strong presence in e-commerce, now derives a significant share of revenues from digital solutions.

The 2025 update of the top 100 digital MNEs highlights several trends and shifts. The number of digital solutions providers has increased significantly, replacing many MNEs in the digital content category (table IV.2). The transition of several ICT-focused firms to digital and cloud-based services and software platforms – including those for technology, operations, service delivery and data management – has resulted in their reclassification. Technological advancements, especially in AI, have boosted the importance of integrating these technologies for business services providers. Meanwhile, consolidation has occurred in the digital content sector.

Table IV.2
Evolution of the top 100 digital enterprises

		Number of MNEs			Average sales per company[a] (Billions of dollars)		
		2017	2025	Change	2017	2025	CAGR (Percentage)
Internet platforms	Search engines	3	3	0	28	111	19
	Social network	5	7	2	5	39	28
	Other platforms	4	7	3	4	69	44
	Total	**12**	**17**	**5**	**10**	**64**	**26**
Digital solutions	Cloud-based solutions	2	9	7	7	25	18
	Fintech	6	6	0	6	12	9
	Software	4	20	16	5	23	22
	Other digital solutions	13	8	-5	3	10	16
	Total	**25**	**43**	**18**	**4**	**19**	**21**
E-commerce	Delivery		3	3	..	6	..
	Internet retailer	13	18	5	12	55	21
	Other e-commerce	5	2	-3	5	9	9
	Total	**18**	**23**	**5**	**10**	**44**	**21**
Digital content	Digital media	23	5	-18	12	45	18
	Games	6	7	1	3	6	10
	Information and data	16	5	-11	4	6	7
	Total	**45**	**17**	**-28**	**8**	**17**	**11**
Total		**100**	**100**	**0**	**8**	**32**	**20**

Source: UNCTAD, FDI/MNEs database.

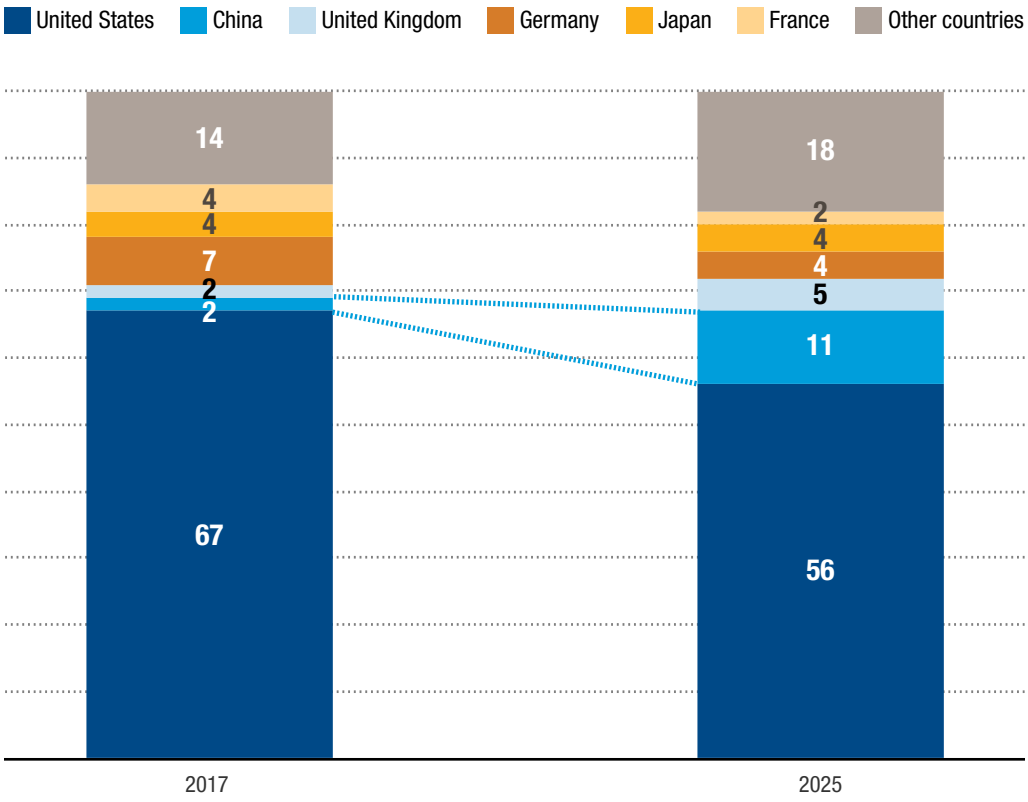
[a] Data on sales correspond to fiscal years 2015 and 2023, respectively.

Abbreviations: CAGR, compound annual growth rate; MNE, multinational enterprise.

Sales growth varies among the four segments of the narrow digital economy. Digital media, for example, has more than doubled its turnover in recent years. Three categories of digital MNEs are distinguished: platforms driving overall growth, e-commerce relying on geographical expansion and commoditized services such as payment solutions growing more slowly. The digital MNEs are concentrated in developed economies, with 57 of the top 100 headquartered in the United States. MNEs from China are gaining ground in digital content, while the presence in the ranking of those in Europe and other developed economies is relatively unchanged (figure IV.2).

Most new entrants to the ranking of top digital MNEs are also headquartered in developed countries. Although the number of firms from China is increasing, many of them maintain a strong domestic focus, limiting their global footprint. Notably, market concentration within the top 100 has grown significantly: from 2017 to 2025, the combined share of sales held by the top five digital MNEs more than doubled – from 21 to 48 per cent. A similar trend is observed in asset concentration, with the top five firms increasing their share

Figure IV.2
Multinational enterprises from the United States and China lead the digital ranking
Top digital firms in the narrow digital economy, by home country
(Number of firms)



Source: UNCTAD, FDI/MNEs database.

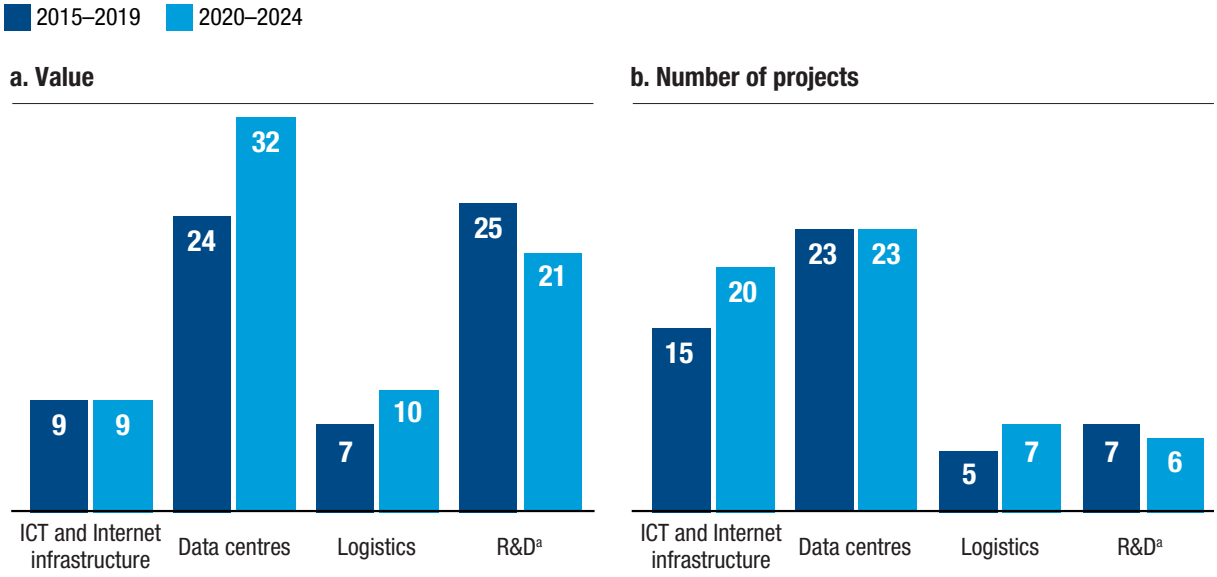
Note: The narrow digital economy builds on the core economy by including platform-based activities, the sharing economy, e-commerce, fintech, artificial intelligence and automation. The core digital economy consists of digital infrastructure and digital services such as telecommunications, Internet and data services, cloud services and cybersecurity protocols.

of total assets from 17 per cent in 2017 to 35 per cent in 2025. This indicates the growing dominance of a few leading firms in the digital MNE landscape. This trend may have implications for market dynamics, potentially affecting competition and the pace of innovation (figure IV.3).

Between 2020 and 2024, digital MNEs accounted for almost one third of announced greenfield projects in data centres, and their share of projects in the logistics sector reached 10 per cent, underscoring the growing role of e-commerce MNEs in global supply chains. Their share of global foreign direct investment (FDI) in research and development (R&D) in IT and software peaked at 26 per cent before 2015, then declined to 21 per cent during 2020–2024.

ICT MNEs provide the enabling hardware infrastructure that makes the Internet accessible to individuals and businesses. They include manufacturers of devices and components and providers of telecommunications and connectivity infrastructure (see annex table A.2). Among manufacturers of information technology (IT) devices and components, producers of semiconductors have increased in number and size since 2017, with most of the revenues concentrated among a few ICT MNEs: Intel and Nvidia (United States)

Figure IV.3
Top 100 digital multinational enterprises account for one third of greenfield investment in data centres
Share of announced greenfield investment, value and number of projects, by selected business activity
(Percentage)



Source: UNCTAD, based on information from The Financial Times Ltd, fDi Markets (www.fDimarkets.com).

[a] R&D in software and IT services.

Abbreviations: ICT, information and communication technology; R&D, research and development.

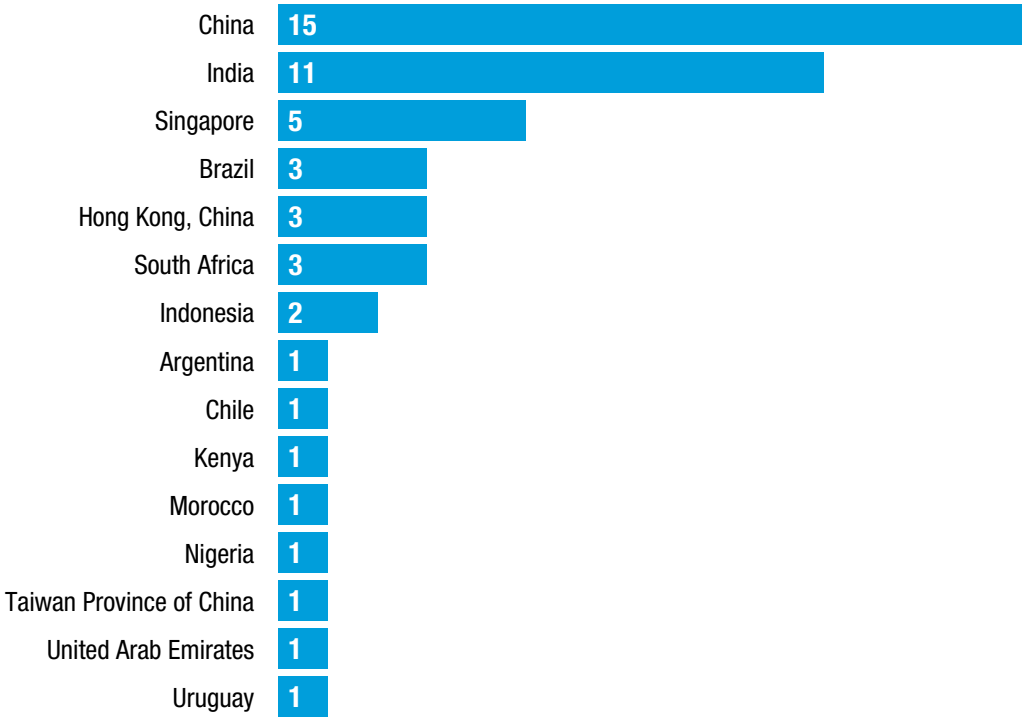
and TSMC (Taiwan Province of China). This concentration is mirrored in the staggering share that these MNEs account for in some industries: more than three quarters of the value of announced greenfield projects in IT devices and semiconductors, and more than a third of those in ICT infrastructure (excluding data centres).

Despite growing rapidly and playing significant regional roles, digital MNEs from developing economies remain underrepresented in the top 100 ranking. An overview of the top 50 digital MNEs from developing economies, categorized in the four main segments of the narrow scope of the digital economy – Internet platforms, digital solutions, e-commerce and digital content – provides valuable insights regarding this evolving sector (figure IV.4).

Digital MNEs from developing countries mainly feature digital solutions and e-commerce companies, with Chinese MNEs such as Alibaba, JD.com and Shein leading the list. In South-East Asia, digital companies often start as smartphone apps and quickly expand to offer services such as delivery, e-commerce, e-payments and video sharing. For example, GoTo (Indonesia), formed from a 2021 merger, is a notable super-app in the region.

Internet platform providers, including search engines, social networks and other platforms, reported average sales per company of $34 billion in 2023. Providers of digital solutions, encompassing cloud-based solutions, fintech, software and others, recorded average sales of $5 billion per company. E-commerce, divided into Internet retailers and other e-commerce

Figure IV.4
Asian multinational enterprises lead in global digital ranking of developing economies, 2025
Top 50 digital enterprises from developing economies, by home country
(Number of firms)



Source: UNCTAD, FDI/MNEs database.

businesses, boasted average sales per company of $31 billion. In comparison, providers of digital content – covering digital media and games – reported average sales per company of $23 billion.

The revenue of top digital MNEs from developing economies is, on average, 28 per cent lower than that of leading global digital MNEs. Their foreign operations are more regionally concentrated, such as those of NuBank (Brazil) and Mercado Libre (Argentina) in Latin America and of Chinese companies in Asia. For example, NuBank, a digital bank founded in 2013, launched operations in Mexico in 2019 and in Colombia in 2020, before its initial public offering (in 2021). One of the motivations is the similarity of the inefficiencies that these markets face, including concentrated banking sectors, poor customer service and a large unbanked share of the population. NuBank, now the largest digital bank by market value, recently invested $150 million in Tyme Group (Singapore), extending its reach outside of Latin America (NuBank, 2024).

b. Other international investors in the digital economy

i. Private equity and venture capital

Private equity and venture capital firms are key investors in early-stage companies and start-ups, particularly in the technology sector. They provide funds in exchange for equity to foster growth. They invest in firms at different stages of development, aiming to accelerate expansion, develop products or restructure operations. Private equity investors fall into three categories: venture capital, growth equity and buyouts.

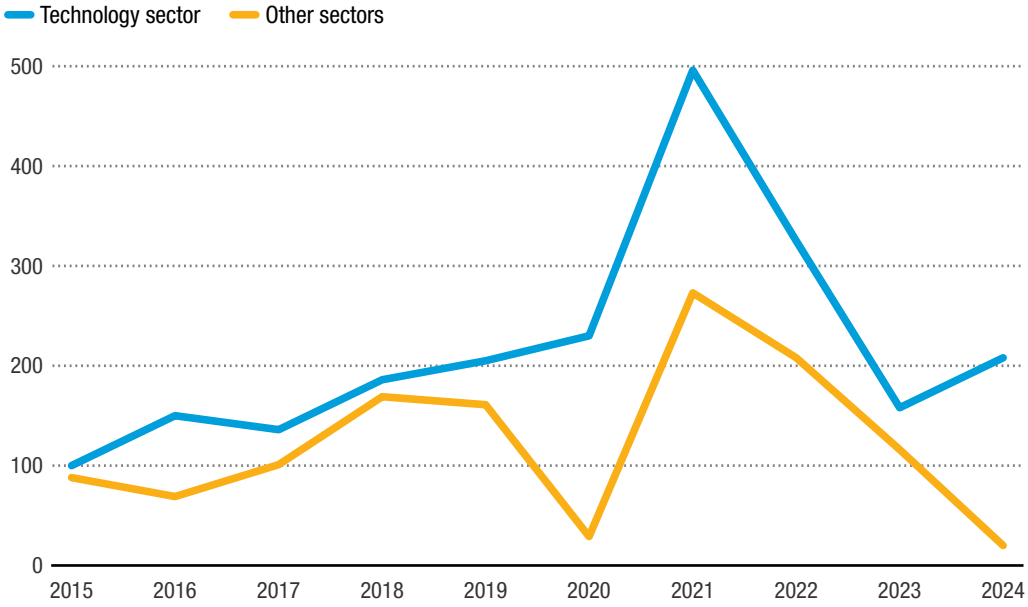
Venture capital fuels both innovative start-ups and established companies. The analysis in this report focuses on venture capital and growth equity, excluding buyout financing. Start-ups can be both recipients and providers of FDI, attracting international venture capital and expanding into new markets.

Almost two thirds of private equity investment goes to the technology sector, which saw robust growth from 2015 to 2021, peaking at $490 billion worldwide. The industry faced a decline from 2021 as a result of rising interest rates, inflation and geopolitical instability, but signs of recovery emerged in 2024, with venture capital investment rebounding to $210 billion (figure IV.5).

In 2024, venture capital and private equity investment in digital technology were concentrated in AI, data processing and business digital solutions, which together attracted more than $80 billion in investment. Fintech and e-commerce attracted $7 billion and $4 billion, respectively. This trend reflects investors' focus on digital infrastructure and operational efficiencies, which drive digital transformation across industries. Blended finance often plays a crucial role in enhancing logistics and distribution centres in developing economies, thereby supporting e-commerce and ICT equipment manufacturing.

Less than half of private equity investment is cross-border, with only one third reaching developing economies. Between 2020 and 2024, technology companies in developing economies received $206 billion in foreign private equity investment, averaging $40 billion per year.

Figure IV.5
Private equity investment in the technology sector experienced significant growth until the pandemic
Private equity and venture capital investment in technology and other sectors (Billions of dollars)



Source: UNCTAD, based on LSEG Data & Analytics.

Foreign private equity accounted for more than 60 per cent of total tech investment in developing economies, with more than 50 per cent from the United States, 7 per cent from the United Kingdom and 6 per cent from other European markets. Asia received the largest shares: 40 per cent in South Asia, 24 per cent in East Asia, 17 per cent in South-East Asia and 5 per cent in West Asia. Latin America and the Caribbean accounted for 12 per cent, and Africa received 3 per cent. Policies that promote venture capital, support credit guarantee schemes and encourage investment in innovation can bridge financing gaps in developing economies. For example, venture funds such as Partech Africa scale up tech start-ups across the continent, demonstrating the potential for private capital to foster innovation. By investing in digital start-ups, developing economies can cultivate a thriving ecosystem of technology-driven businesses that solve local problems while creating new economic opportunities (World Bank, 2024).

Private equity firms investing in developing economies are mostly from North America and some advanced economies in Asia (China, some Gulf States, Singapore). Top investors in tech companies include Softbank (Japan) and various United States firms such as Tiger and Global Sequoia. Digital MNEs from developing economies, such as Naspers (South Africa) and Tencent (China), also provide venture capital to tech start-ups. Sovereign wealth funds (SWFs) and public pension funds, including the Abu Dhabi Investment Authority (United Arab Emirates) and GIC (Singapore), are significant sources of venture capital. Start-ups in developing economies rely heavily on international venture capital funding, making them vulnerable to global investment declines. Private equity and venture capital investment drive innovation growth in emerging markets. Economies in South-East Asia receive more than half of private equity investment in technology sectors, as 40 per cent of the world's start-ups are in developing Asia.

China, India, Malaysia, Singapore and Thailand are prominent hubs for start-ups.

A thriving start-up ecosystem relies on governmental support through comprehensive policies, funding and mentorship programmes to strengthen local venture capital and private equity industries. Regional integration initiatives help start-ups scale up beyond national borders. Attracting foreign start-ups, venture capital and entrepreneurial talent through targeted programmes, such as Start-Up Chile and the Tech Entrepreneur Programme in Malaysia, can enhance local ecosystems. A recent example of FDI contributing to national digital development is Google's planned investment in Malaysia, which includes the establishment of a data centre and a cloud region. According to the Malaysian Investment Development Authority, this initiative aligns with the country's Cloud First Policy and is expected to support digital infrastructure, job creation and innovation (ASEAN, 2023).

Broader research highlights how FDI in South-East Asia can help bridge the digital divide and support sustainable growth. Similarly, the United Nations emphasizes the importance of collaborative digital infrastructure investments involving governments, private sector actors, and academia (ITU and Department of Economic and Social Affairs, 2025).

These advancements are especially crucial for SMEs, which are increasingly leveraging digital tools to compete globally (box IV.3). SMEs play a significant role in domestic economies, and their internationalization through exporting or investing abroad can bring economic benefits to home and host countries (UNCTAD, 2024a). This is particularly important for SMEs in landlocked developing countries and small island developing States, where digitalization can help address the logistical and connectivity challenges associated with their geographical constraints. Internationalization by SMEs improves their productivity and strengthens their resilience to external shocks.

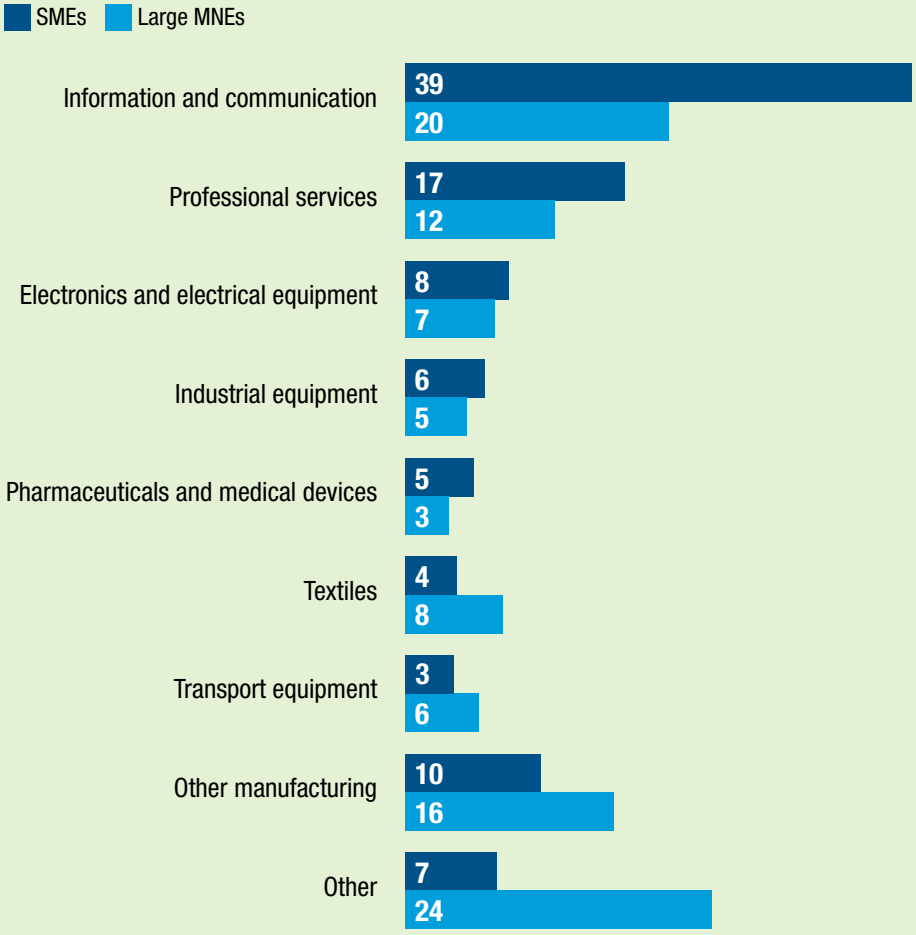
Box IV.3
SMEs in the digital economy

SMEs are enterprises with revenues of less than $15 million and fewer than 300 employees (International Finance Corporation, 2012). Digitalization and technology adoption enable SME growth. ICT reduces costs and improves transparency, lessening SMEs' networking and information disadvantages and facilitating international investment. Digital technologies improve access to global value chains by reducing governance and transaction costs (UNCTAD, 2020b). They help SMEs overcome barriers through the use of payment apps, collaboration platforms, cloud-based services and crowdfunding (UNCTAD, 2024a). Fourth Industrial Revolution technologies have facilitated foreign investment by SMEs, with smaller companies leveraging digitalization to gain market presence, especially in services (UNCTAD, 2024a; Park et al., 2022). The importance of digital technologies for the internationalization and growth of SMEs is confirmed by their investment abroad: 40 per cent of greenfield investment projects by SMEs are in IT and software (box figure IV.3.1).

Digitalization empowers SMEs by lowering barriers to entry, reducing costs and enabling innovative business models, thus enabling them to compete globally. As emerging investors, SMEs drive innovation, create jobs and foster economic growth, particularly in IT and software sectors.

Source: UNCTAD.

Box figure IV.3.1
Almost 40 per cent of greenfield projects by SMEs are in information and communication
Top industries of multinational enterprises investing abroad, 2015–2022, by firm size
(Percentage of number of projects)



Source: UNCTAD (2024b).
Abbreviation: MNEs, multinational enterprises; SMEs, small and medium-size enterprises.

For knowledge-intensive enterprises, FDI can bring significant learning benefits, accelerating the technological catch-up of developing countries. This contributes to developing a dynamic and competitive local private sector, key to economic growth and attractive to foreign investors. However, when engaging in FDI SMEs often face greater risks and challenges than larger firms. This underscores the importance of supportive policies and programmes to mitigate risks and foster sustainable growth for SMEs in the global market.

ii. Sovereign wealth funds

SWFs have become increasingly influential players in global foreign investment. Their investment modes, preferred sectors and geographical focus vary depending on their strategic objectives, mandates and home countries. Common approaches are to

invest indirectly through private equity and venture capital funds, or co-invest directly through established fund managers.

The analysis of international equity investment in this report shows that over the past decade SWFs participated in private equity deals in the digital economy totalling $36 billion, accounting for approximately 5 per cent of total investment in the sector. Virtually all were cross-border deals and evenly distributed between developed and developing countries as host economies. Developed economies received 53 per cent of total international private equity investment, led by the United States as the primary destination. In comparison, developing Asia attracted 46 per cent, with India emerging as the main recipient, followed by China.

Over the past five years, investment in tech start-ups by SWFs has doubled, reaching a total of $21 billion – an average of about $4 billion per year. Three funds account for most of this activity: Temasek Holdings (Singapore) with 27 per cent, Mubadala Capital (United Arab Emirates) with 26 per cent and GIC (Singapore) with 18 per cent. Some SWFs are increasingly investing in greenfield infrastructure projects – particularly data centres – despite their traditionally higher risks and longer time horizons, drawn by the appeal of stable, long-term cash flows.

Between 2020 and 2024, two SWFs announced greenfield investment projects in data centres that represented 30 per cent of total investment by SWFs in the digital economy, almost equally divided between developed and developing economies. The largest number of projects (42 per cent of the total) were announced in 2023, followed by a slight slowdown in 2024. SWFs contribute 5 per cent of total investment in data centres across developing economies, highlighting their role in strengthening the digital infrastructure essential for digital transformation. India is the main destination for such investment in terms of value (24 per cent of the total), and SWFs from Japan lead in the number of projects sponsored, with six between 2020 and 2024 (table IV.3).

Table IV.3
Announced data centre projects by sovereign wealth funds, 2020–2024

Recipient economy	Number of projects	Value (Millions of dollars)	Share of total data centre investment (Percentage)
India	33	3 593	24
Germany	33	3 585	24
Malaysia	44	2 153	14
Japan	6	1 636	11
Philippines	4	763	5
Mexico	1	424	3
United States	1	357	2
Finland	1	332	2
Republic of Korea	1	317	2
Thailand	1	266	2
France	1	249	2
Poland	1	245	2
Italy	1	213	1
Indonesia	1	192	1
Viet Nam	1	191	1
Spain	1	190	1
Ireland	1	179	1
Brazil	1	144	1
Total	**133**	**15 027**	**53**

Source: UNCTAD, based on information from The Financial Times Ltd, fDi markets (www.fdimarkets.com).

2. Foreign direct investment in the digital economy: Latest trends and developments

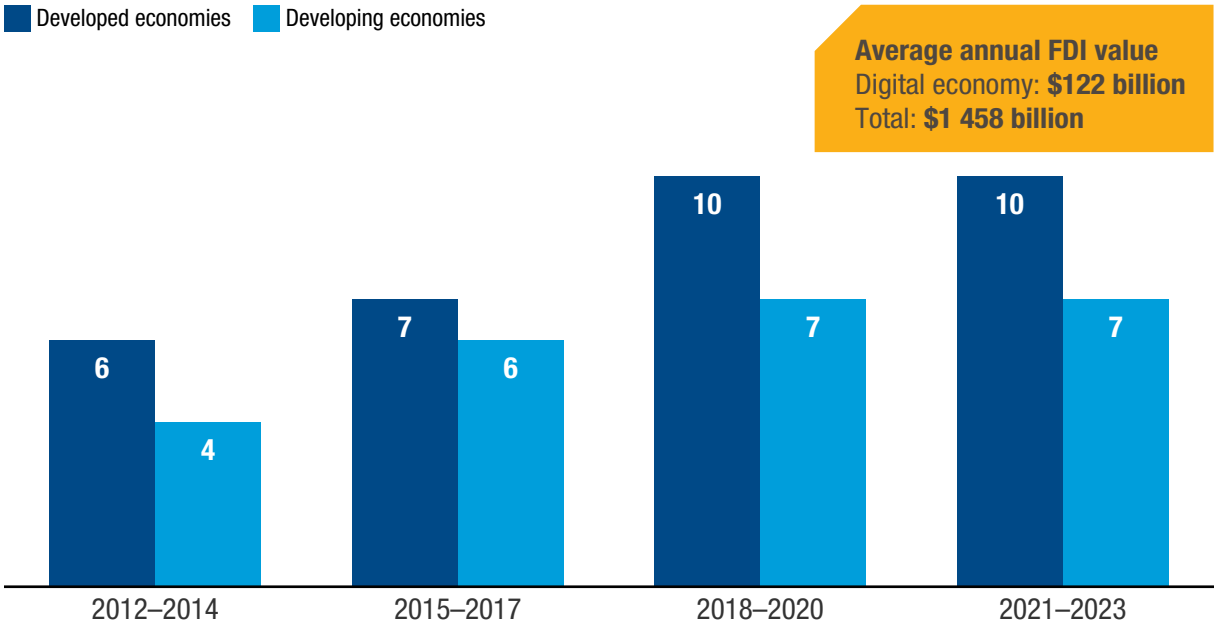
a. Trends and features of FDI in the digital economy

Between 2012 and 2023, 72 per cent of FDI inflows in the digital economy went to the information and communication sector, and 28 per cent to computer, electronic and optical product manufacturing. This distribution aligns with projections that digital information and telecommunications will account for 71 per cent of $6 trillion in future profits across 18 promising sectors (McKinsey & Company, 2024).

However, investment in digital economy manufacturing still represented only 7 per cent of total FDI inflows during this period. Although the data reveal volatility – particularly in developed economies – FDI in the core digital economy continued to gain importance in developing economies after 2012, with modest growth continuing through 2018 (figure IV.6).

Among the 15 largest recipients of FDI inflows in information and communication between 2012 and 2023, only 5 are developing economies.

Figure IV.6
Developed economies attract more foreign direct investment in core sectors of the digital economy
Inflows to core sectors as a share of total investment, by economic grouping
(Percentage of the value)



Source: UNCTAD, FDI/MNE database (www.unctad.org/fdistatistics).

Note: Data available for 93 economies (49 developing economies, 44 developed economies). Core sectors include ICT manufacturing industries and ICT services industries, according to the ISIC4 classification available in UNCTAD (2020).

[a] Average of the yearly sum of values.

Abbreviation: FDI, foreign direct investment; ICT, information and communication technology.

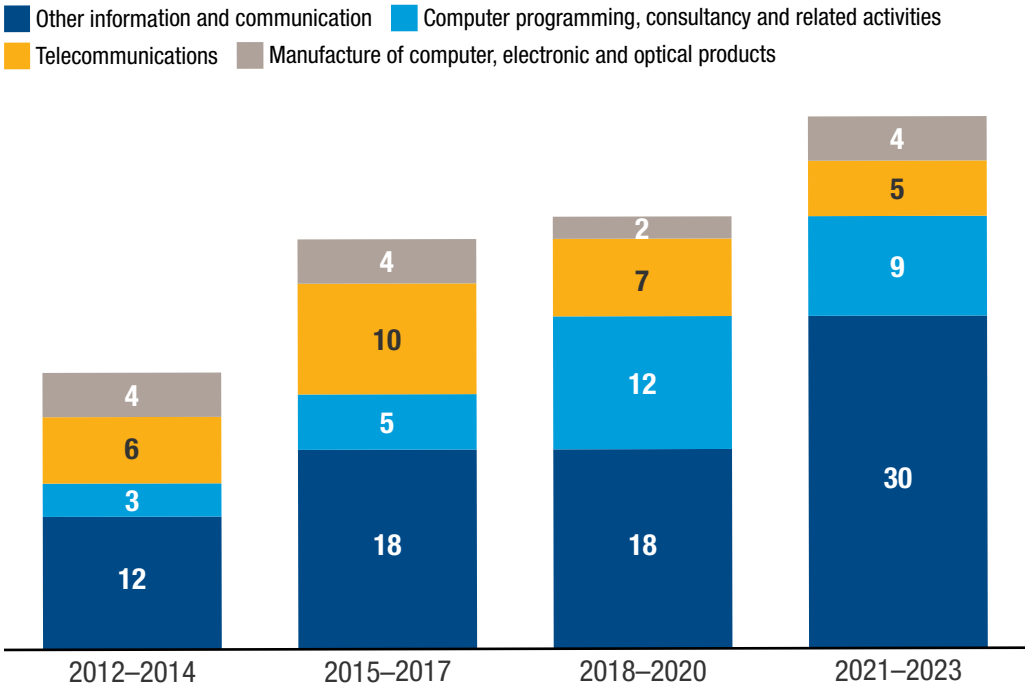
This share is even lower in computer, electronic and optical products manufacturing, with only 4 developing economies among the top 15 recipient countries. The United States is the largest recipient in both sectors; among developing economies, China, Brazil and Mexico attract the most significant investment.

Investment trends in developing economies reveal evolving patterns within key sectors of the digital economy (figure IV.7).

The telecommunications sector saw strong investment in the early 2010s but investment has since stabilized. In contrast, investment in computer programming, consultancy and related activities has grown since 2018. The core digital economy in developing economies has diversified, with peaks in inflows often driven by surges in individual countries. For example, the growth in computer programming inflows after 2020 was largely attributable to India. These shifts have been driven by the diversification of digital services, greater demand for software solutions, and the growth of tech talent and start-up ecosystems in specific countries. Difficult financing conditions, including high interest rates and tighter credit markets, have made it harder for investors to fund large-scale telecommunications projects.

Figure IV.7
International investment in digital economy sectors is increasing, except in telecommunications

Inflows to developing economies in core sectors of the digital economy
(Billions of dollars)



Source: UNCTAD, FDI/MNE database (www.unctad.org/fdistatistics).

Note: Data are available for 52 economies. Other information and communication includes unspecified information and communication; information service activities; motion picture, video and sound recordings; programming and broadcasting activities; and publishing activities.

Many investors prefer sectors that offer higher returns or lower risks, such as renewable energy or healthcare, over telecommunications (UNCTAD, 2024c).

Data on investment in data centres are limited, with only Mexico and the United States reporting inflows in data processing, hosting and related activities. United States inflows are higher and more consistent, peaking at $1.5 billion in 2014 and $1.1 billion in 2023, 39 per cent lower than the $1.8 billion in announced greenfield projects. Data centre-related FDI outflows in the digital economy mirror inflows, averaging 5 per cent of the total. Developed economies drive these outflows, with China accounting for nearly half of FDI outflows from developing economies between 2010 and 2023 and 66 per cent of outflows to the digital economy. Taiwan Province of China is notable for FDI in manufacturing of computer, electronic optical products and electrical equipment.

b. Greenfield projects in the digital economy

Digital MNEs invest internationally through both greenfield investment and cross-border mergers and acquisitions (M&As). Greenfield investment is in construction and expansion projects in digital industries, contributing to the build-up of digital infrastructure and the provision of additional digital services, and cross-border M&As are the acquisition of enterprises in the host country without directly creating digital facilities or employment (box IV.4). Greenfield investment in the digital economy includes projects to develop digital infrastructure, services and innovation ecosystems (table IV.4). These projects are crucial for building and sustaining a digital economy and can have significant developmental impacts.

The relevance and impact of digital greenfield projects vary based on a country's development and digital maturity levels. For lower income economies, broadband infrastructure and e-commerce logistics are crucial for bridging the digital divide. More advanced countries – middle-income and upper-income ones – benefit from R&D centres and manufacturing projects, with AI investment gaining prominence in healthcare, agriculture and education.

In addition to traditional manufacturing centres and R&D facilities, technology-focused special economic zones (SEZs), including science and technology parks and areas of innovation, have emerged as key players (see *World Investment Report 2019* (UNCTAD, 2019)). These zones attract substantial international investment by offering stable, knowledge-intensive environments that foster innovation and collaboration. They serve as critical hubs for developing and attracting talent, with diverse ownership structures and governance models enhancing their effectiveness. Examples include the pilot free trade zones in China, the Multimedia Super Corridor (now MSC Malaysia) in Malaysia and the three high-tech parks in Viet Nam, all of which focus on advancing the digital economy through various incentives and innovative practices.

Greenfield investment in the digital economy has grown rapidly. It surged to $360 billion in 2024, accounting for 28 per cent of all greenfield investment, second only to the 33 per cent peak reached in 2021 during the pandemic (figure IV.8).

Table IV.4
Types of greenfield investment projects in the digital economy

Type of project	Description
ICT infrastructure	Projects that focus on expanding high-speed Internet access and mobile network coverage, both foundational to any digital economy, providing the connectivity required for all other digital activities.
Data centres	Projects that provide essential local data storage and processing capabilities, supporting cloud computing, digital services and local data sovereignty while reducing latency in service delivery.
Digital services and solutions	Projects that include online payment systems and applications such as fintech, healthtech, agritech and edtech, as well as e-commerce, all services that expand functionality and accessibility of digital ecosystems, supporting innovation and digital tool adoption across sectors.
	Projects in AI, automation and R&D that drive technological advancements, development of new digital products and services, enhancement of skills and creation of high-value jobs.
ICT equipment	Projects in production of digital devices, telecommunications equipment and semiconductors, all essential for technological self-sufficiency and global supply chains.

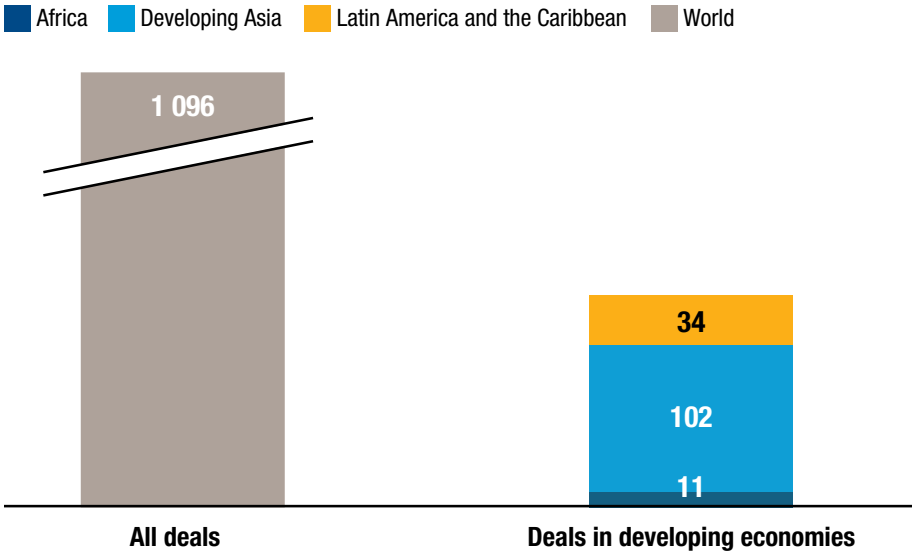
Source: UNCTAD.

Abbreviations: ICT, information and communication technology; R&D, research and development.

Box IV.4
Cross-border M&As in the digital economy in developing economies

Cross-border M&A deals in the technology sector have averaged nearly $1 trillion annually over the past decade. Less than 15 per cent have involved companies from developing economies, with nearly half of the deals targeting firms in China, India and Singapore (box figure IV.4.1). Most deals aim to accelerate revenue growth by acquiring new capabilities and accessing faster-growing markets. Software companies accounted for 40 per cent of deal value, whereas in developing economies ICT companies were more often targeted. The top 100 digital MNEs are key players in international M&As, especially in developed economies, seeking innovative companies to complement their R&D efforts. Most acquisitions by top players are domestic, as in the $70 billion acquisition of Activision by Microsoft (both United States) in 2022.

Box figure IV.4.1
Limited activity in cross-border mergers and acquisitions in developing economies, with developing Asia leading as host
Value of international deals in the digital economy, 2020–2024
(Billions of dollars)



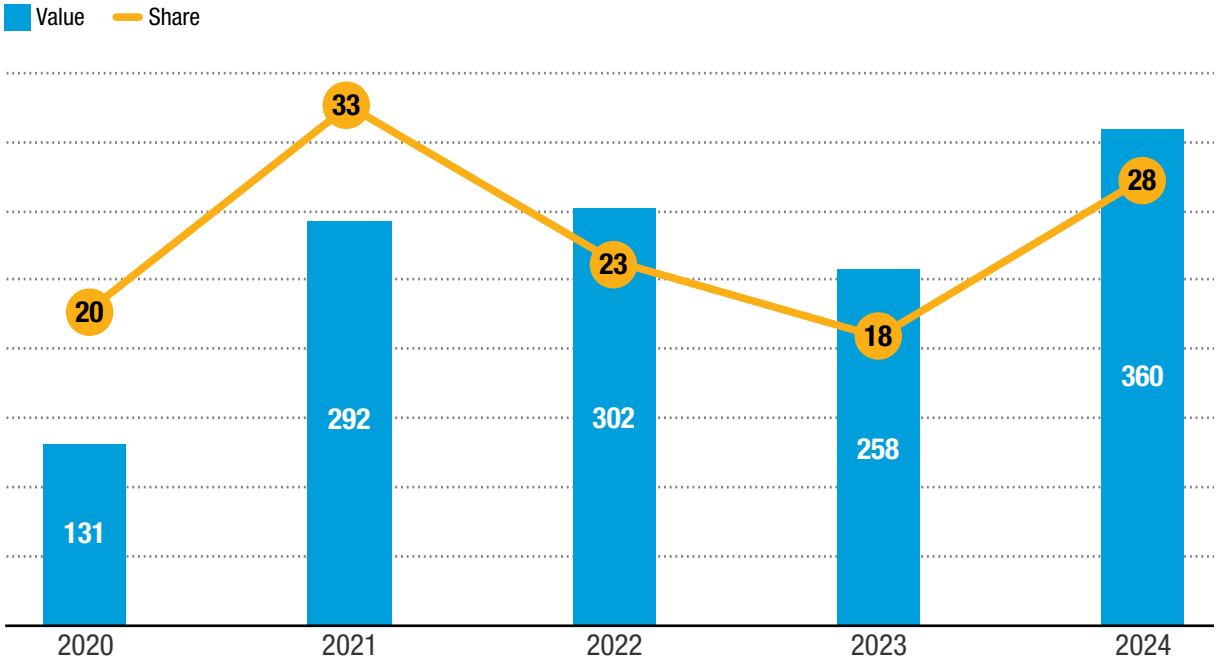
Source: UNCTAD, based on LSEG Data & Analytics.

In developing economies, the impact of digital economy drivers on M&A values is mixed because there are fewer deals. Digital readiness and regulatory clarity are crucial for fostering M&A activity. Developed economies benefit most from digital capacity and incentives, while developing countries gain from clear, consistent and open data governance frameworks.

Source: UNCTAD.

Figure IV.8
The share of greenfield investment in the digital economy rose to 28 per cent in 2024

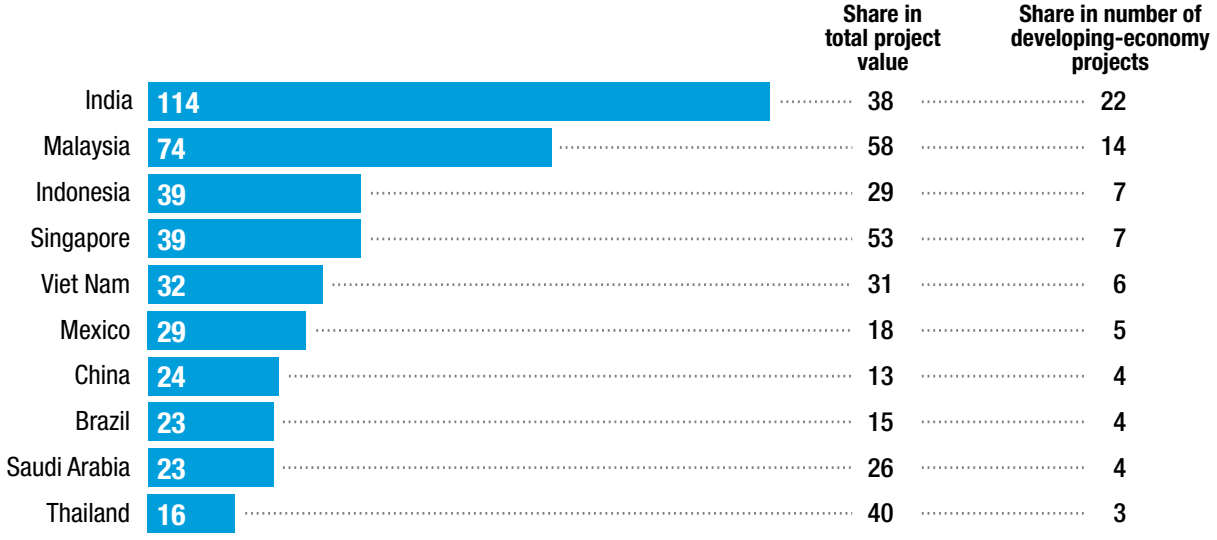
Value of announced greenfield investment in the digital economy and share in total greenfield investment
(Billions of dollars and percentage)



Source: UNCTAD, based on information from The Financial Times Ltd, fDi Markets (www.fdimarkets.com).

Figure IV.9
Greenfield investment highly concentrated in the digital economy, with 78 per cent of flows going to 10 developing economies

Top 10 developing economies by project announcements in digital economy sectors, 2020–2024
(Billions of dollars and percentage)



Source: UNCTAD, based on information from The Financial Times Ltd, fDi markets (www.fdimarkets.com).

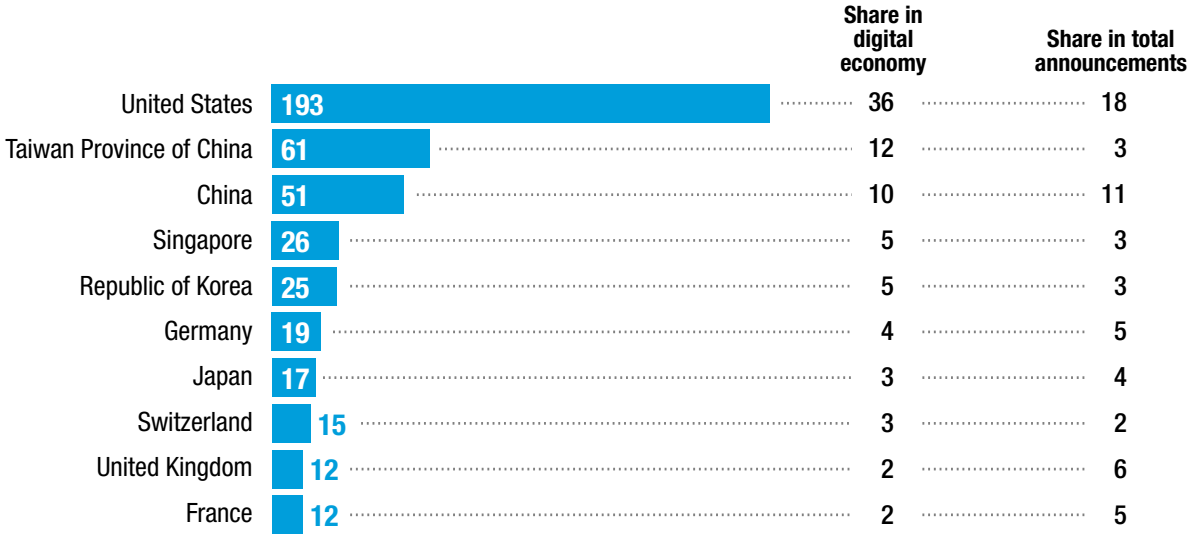
Between 2020 and 2024, developing countries have attracted a total of $531 billion in announced greenfield projects in the digital economy. FDI in digital projects is highly concentrated among developing economies, with nearly 80 per cent directed to 10 countries (figure IV.9). Six Asian economies – India, Malaysia, Indonesia, Singapore, Viet Nam and China by order of announced projects – account for more than 60 per cent of digital greenfield investment. Saudi Arabia and the United Arab Emirates lead in West Asia, and Brazil and Mexico are the primary destinations in Latin America. Egypt and Nigeria rank just outside the top 10, leading in Africa.

Developed economies drive greenfield investment in the digital economy of developing regions, reflecting the concentration of leading digital companies and ecosystems. MNEs from the United States are particularly prominent, accounting for more than a third of these digital-related projects (figure IV.10).

Investment in the digital economy by and between developing economies is increasing, driven by developing Asia. China and Taiwan Province of China are the first and the second leading sources of investment by value, reinforcing Asia's role as both host and origin of capital (figure IV.11). MNEs and SWFs from the Middle East, led by those from the United Arab Emirates and Qatar, lead investment in e-commerce, semiconductors and telecommunications.

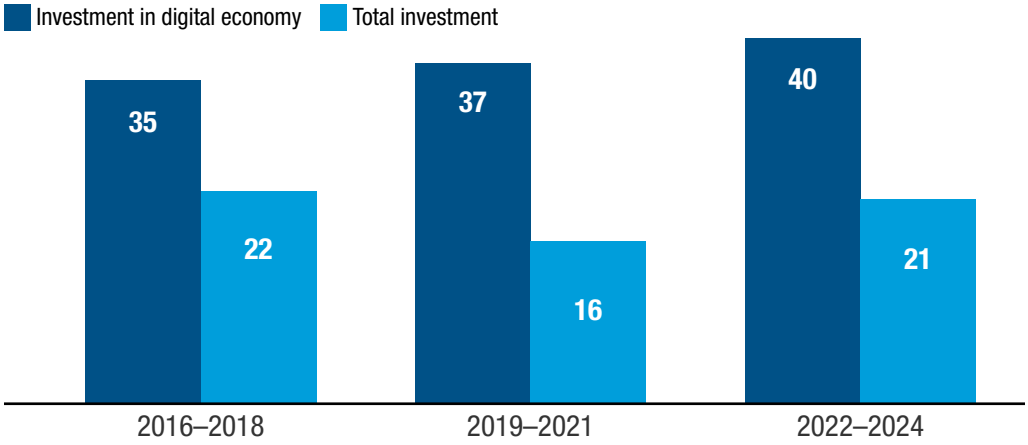
The sectoral distribution of greenfield project announcements in developing economies has transformed significantly. Between 2020 and 2024, ICT manufacturing attracted the highest inflows; recently, digital services and solutions have gained prominence, indicating a shift towards higher-value segments such as AI (figure IV.12). Investment in enabling infrastructure in 2024 remained below 2020 levels but is steadily increasing, emphasizing the importance of connectivity.

Figure IV.10
Developed economies are the main source of greenfield investment in the digital economy
Top 10 home economies of investors in developing economies by project announcements in digital economy sectors, 2020–2024
(Billions of dollars and percentage)



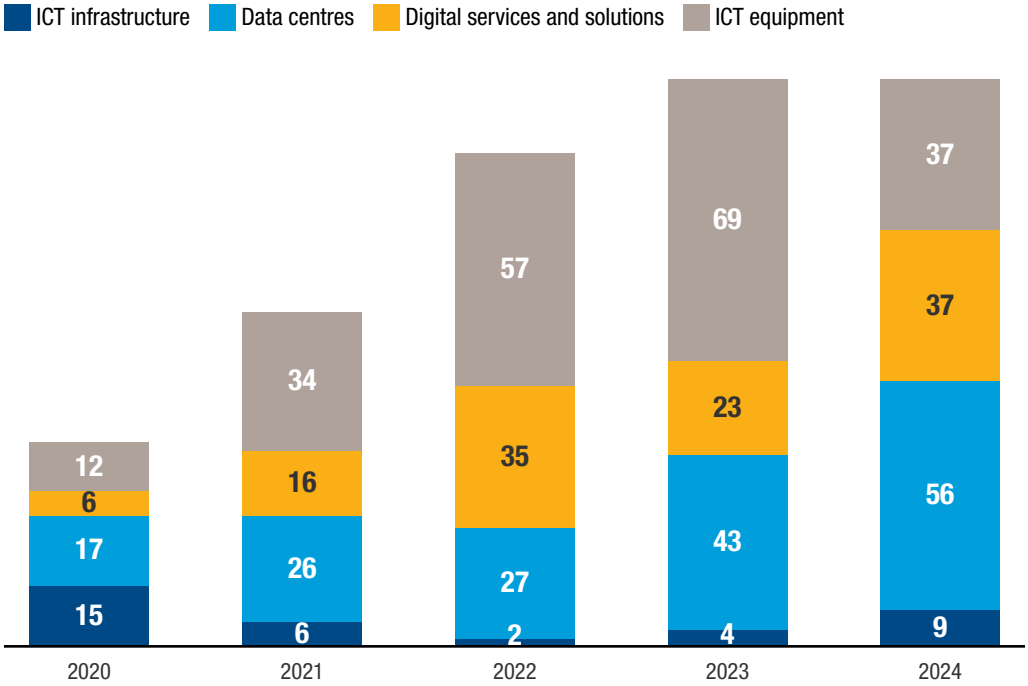
Source: UNCTAD, based on information from The Financial Times Ltd., fDi markets (www.fdimarkets.com).

Figure IV.11
Growing role of South–South greenfield investment in the digital economy
Share of South–South investment in greenfield projects in the digital economy and in all sectors
(Percentage of value)



Source: UNCTAD, based on information from The Financial Times Ltd, fDi markets (www.fdimarkets.com).

Figure IV.12
Greenfield investment grew more than fivefold in digital services and solutions since 2020 and more than threefold in data centres
Announced greenfield projects in selected sectors of the digital economy in developing economies
(Billions of dollars)



Source: UNCTAD, based on information from The Financial Times Ltd, fDi Markets (www.fdimarkets.com).
Abbreviation: ICT, information and communication technology.

Distribution networks and logistics, though not part of the core digital economy, are crucial for e-commerce and in developing economies have attracted rising investment.

c. International investment in key industries of the digital economy

i. ICT infrastructure

In 2019, nearly half of the global adult population remained unconnected to broadband (ITU, 2020). Achieving the goal of bridging the connectivity gap by 2030 requires substantial investment in enabling infrastructure, which remains critically underfunded. In 2024, the value of global greenfield investment announcements in ICT infrastructure reached $14.9 billion, less than 25 per cent of the estimated $62 billion required annually to meet financing needs (table IV.5). According to the International Telecommunication Union (ITU), nearly 70 per cent of the necessary investment should be directed towards low- and lower-middle-income developing countries, with a particular focus on connecting rural and remote populations that remain underserved (ITU, 2020). Despite some progress in 2024, the current pace of investment is insufficient to meet the demand for core ICT infrastructure.

Two regions combined – North America and Latin America and the Caribbean – saw a significant rise in the value of announced greenfield projects (from $3.3 billion in 2023 to $8.2 billion in 2024) – a level of investment sufficient to meet their needs for bridging the connectivity divide.

Table IV.5
Annual financing needed to bridge the connectivity divide and greenfield investment in ICT infrastructure, by region, 2023–2024
(Billions of dollars)

		Value of announced greenfield projects in core infrastructure	
Region	**Annual financing needs[a]**	2023	2024
Americas	7.4	3.3	8.2
East Asia and Pacific	12.1	0.4	3.8
Europe and Central Asia	4.8	2.5	1.1
Middle East and North Africa	4.1	0.3	0.0
South Asia	19.6	0.8	1.0
Sub-Saharan Africa	14.1	1.0	0.7
Total	**62.0**	**8.3**	**14.9**

Source: UNCTAD, based on information from The Financial Times Ltd, fDi Markets (www.fdimarkets.com) and ITU (2020, 2025).

[a] The estimation of the investment needed for global broadband access by 2030, according to preliminary data from the ITU, includes analysis of capital expenditures for infrastructure deployment. Estimations include fixed and mobile infrastructure, and backbone infrastructure. The methodology uses a country-level approach, starting with the number of unconnected people, particularly those not connected to 4G or equivalent broadband. These estimations are valid for the lower band of the projected investment gap; the upper band could reach up to $910 billion by 2030 (approximately $182 billion annually). The data are based on preliminary estimations from the Digital Infrastructure Investment Initiative white paper (ITU, 2025), divided by the five years remaining to 2030 and proportionally attributed to regions using the regional split from the 2020 Connecting Humanity study (ITU, 2020). Country classifications are based on ITU categorization owing to data availability.

Abbreviation: ICT, information and communication technology; ITU, International Telecommunication Union.

Yet, that investment remains highly concentrated in just a few countries (Mexico: 53 per cent, the United States: 29 per cent, Colombia: 12 per cent), while other countries in the region remain excluded from those resources.

In contrast, regions that have the highest financing needs, such as South Asia and Sub-Saharan Africa, remain critically underserved. In 2024, Sub-Saharan Africa attracted projects covering only 5 per cent of its $14.1 billion annual need. Greenfield project announcements in South Asia remained mostly stagnant, at only $1 billion in 2024 against a $20 billion annual need, while the Middle East and North Africa saw no new investment announcements, despite an annual gap of $4.1 billion. Europe and Central Asia saw a sharp decline in announced projects, from $2.5 billion in 2023 to just $1.1 billion in 2024, meeting less than 24 per cent of its needs.

The investor landscape is evolving, with new categories of investors influencing ICT infrastructure projects. Top digital MNEs are involved in hyperscale data centres, while telecommunications companies focus on smaller projects. Financial companies, including those focused on investment and on real estate, are increasingly supporting infrastructure projects.

Investment in telecommunications networks, including cables and wireless infrastructure, is typically financed through project finance schemes based on projected cash flows. ICT infrastructure investment is often domestic, aiming to serve social and inclusive purposes. The cost of capital remains a significant barrier. Globally, less than half of telecommunications infrastructure investment involves foreign sponsors or equity investors.

International project finance accounts for almost 60 per cent of investment in connectivity infrastructure, as these projects are typically larger and more costly (e.g. undersea cables, satellite connectivity). Almost a third of this investment involves equity stakes by host-country governments.

Developing countries' share of international project finance in ICT infrastructure is lower than the global share, although in least developed countries (LDCs), foreign sponsors account for half of the projects and more than 70 per cent of the investment value (table IV.6). Public sector involvement is higher in developing countries both for domestic and international projects. Government equity participation can attract foreign private investors by reducing perceived risks.

Developed economies are the main destinations for greenfield investment in ICT and telecommunications infrastructure. Between 2020 and 2024, developed economies secured $39 billion, while developing economies received $36 billion (figure IV.13). Among developing economies, the largest recipients are Mexico, followed by Nigeria and Malaysia, reflecting the scale of their consumer markets and the need to expand digital infrastructure.

Telecommunications MNEs from Europe and developing Asia are key investors in ICT infrastructure in developing economies (figure IV.14). From 2020 to 2024, firms from Europe led global ICT and telecommunications investment, with a 26 per cent share of the total, followed by firms in North America (25 per cent) and developing Asia (24 per cent).

Large investment gaps in digital infrastructure pose significant barriers for developing countries, limiting their ability to bridge the digital divide and achieve the Sustainable Development Goals. Currently, investment flows are highly concentrated, with a few major players dominating regional markets.

China Mobile Communications is the main investor in developing economies, with two thirds of its investment in Africa, 17 per cent of that allocated specifically to Nigeria. Alphabet (United States) leads non-telecommunications investment, focusing on developing Oceania (39 per cent) and Africa (25 per cent). The SWF Temasek (Singapore) is key in developing Asia, especially in Malaysia and in Viet Nam.

Development finance institutions including multilateral development banks can play a pivotal role in accelerating the development of connectivity infrastructure by addressing financing constraints, including the high cost of capital (box IV.5). They provide direct loans and grants, thereby catalysing private investment. This is particularly important since guarantees are in place for only 5 per cent of loans to project finance in developing countries.

Table IV.6
Project finance in ICT infrastructure, by investor type and country grouping, 2015–2024
(Percentage)

Type of project	Unit	Global		Developing countries		Least developed countries	
		Domestic	International	Domestic	International	Domestic	International
Total	**Number**	**53**	**47**	**58**	**42**	**50**	**50**
	Value	**41**	**59**	**43**	**57**	**29**	**71**
Public	Number	21	10	27	12	38	16
	Value	18	19	17	32	21	40
Private	Number	32	37	30	31	12	34
	Value	23	40	26	25	8	31

Source: UNCTAD, based on information from LSEG Data & Analytics.

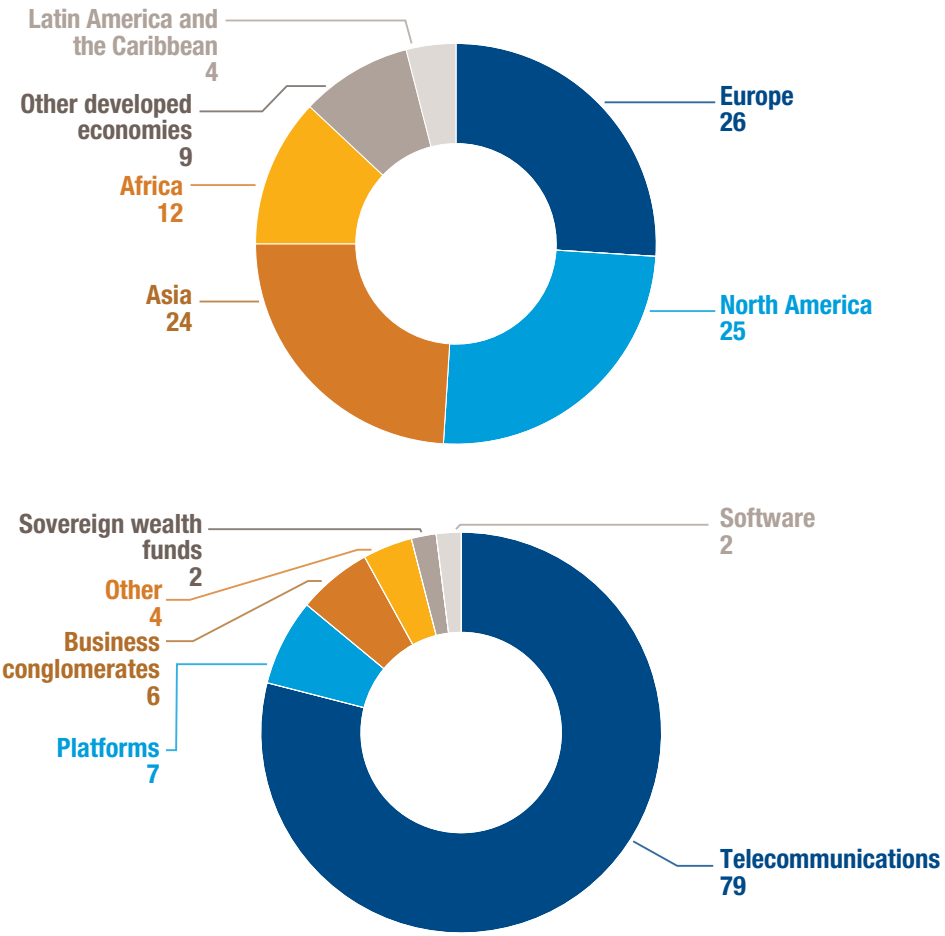
Note: A project is defined as public if the ultimate owner of the project company is a government agency or a State-owned enterprise or has an equity participation from the host State. A project is defined as international if at least one sponsor is foreign.

Figure IV.13
Large developing economies are key destinations for investment in ICT infrastructure
Announced greenfield projects in ICT Infrastructure, share by region and top five host developing economies, 2020–2024
(Billions of dollars)

Source: UNCTAD, based on information from The Financial Times Ltd, fDi Markets (www.fdimarkets.com).

Abbreviation: ICT, information and communication technology.

Figure IV.14
Telecommunications companies are the backbone for ICT infrastructure
Value of greenfield investment in developing economies in ICT infrastructure by investor home region and investor type, 2020–2024
(Percentage)



Source: UNCTAD, based on information from The Financial Times Ltd, fDi Markets (www.fdimarkets.com).
Abbreviation: ICT, information and communication technology.

Since 2018, development finance institutions including multilateral development banks have extended an average of $600 million annually in loans and grants to developing countries for ICT infrastructure, covering approximately 10 per cent of total project costs. Although this amount has increased significantly since the onset of the pandemic, it remains only about half of what development finance institutions alone have invested in transport infrastructure (approximately $1.1 billion annually since 2018) and represents only a modest share of the investment directed towards renewable energy (about $3.7 billion annually).

ii. Data centres

Investment in data centres is crucial for digital infrastructure, and cloud computing MNEs are playing a leading role as primary investors (table IV.7). Statistics on the share of international investors involved in project finance deals aimed at creating data centres are less accurate than the statistics on core ICT infrastructure.

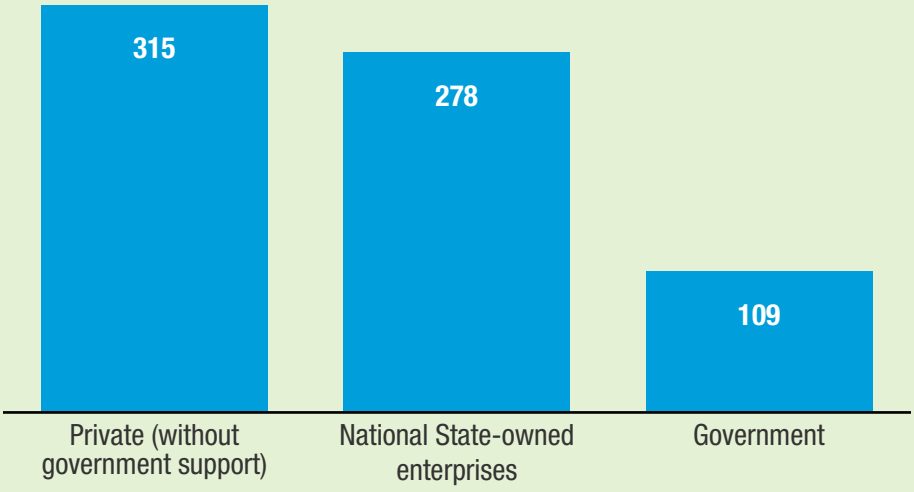
Box IV.5
Financing digital infrastructure

High costs and uncertain returns deter investment in underserved markets in the digital economy, making concessional funding and policy support crucial to bridge the digital divide. Basic digital infrastructure projects are capital-intensive, requiring significant upfront investment, long construction times and coordination across multiple sectors, making them better suited for loans with project finance as use of proceeds than for other types of capital-raising mechanisms. This emphasizes the need for infrastructure finance, public-private partnerships (PPPs) and support by development finance institutions.

As venture capital and international project finance become increasingly global, long-term infrastructure loans in developing economies remain limited and typically bear higher yields because of the high-risk environments. These loans also require greater equity participation than those in developed economies (box figure IV.5.1). One potential approach to mitigate their cost is through the support of national governments, development banks and export-import agencies. Projects executed by State-owned companies are associated with marginally smaller loan spreads, and projects receiving government sponsorship secure loans with spreads that are 200 basis points lower than those of private companies that lack government or development bank.

Box figure IV.5.1
Government participation reduces spread of project finance loans in developing economies

Average spread of cross-border telecommunications project finance loans in developing economies by sponsor type, 2000–2024
(Basis points)



Source: UNCTAD, based on information from LSEG Data & Analytics.

Note: The spread values are the amount charged over the underlying pricing instrument at the drawing of the loan, e.g. EURIBOR.

Source: UNCTAD.

Top investors in data centres, such as Amazon, Alphabet and Microsoft (all United States), finance projects from corporate funds, rather than using a project finance structure. As a consequence, many of their projects, especially domestic ones, are not captured in project finance data. This explains the high share of international project finance investment in data centres globally. In contrast, in developing countries, foreign sponsors account for about half the number of projects and for less than half (45 per cent) of their value. Large developing economies such as India, Malaysia and Saudi Arabia host large domestic projects sponsored by local firms and SWFs. Investments in data centres feature limited government involvement: in developing economies, less than 20 per cent of projects (14 per cent domestic and 4 per cent international) have a national authority or ministry as sponsor.

Greenfield investment in data centres is unevenly distributed across developing economies. Between 2020 and 2024, middle-income developing economies accounted for 80 per cent of investment in data centres in developing economies, with balanced values across mega-, medium- and small-scale projects (figure IV.15). Major emerging markets such as Brazil, China, India and Mexico have attracted nearly 160 companies to invest in data infrastructure. In contrast, LDCs received only 3 per cent of all data centre projects by value, and all were small, mainly because of infrastructure and connectivity constraints, and small markets with low levels of digital readiness (UNCTAD, 2024a).

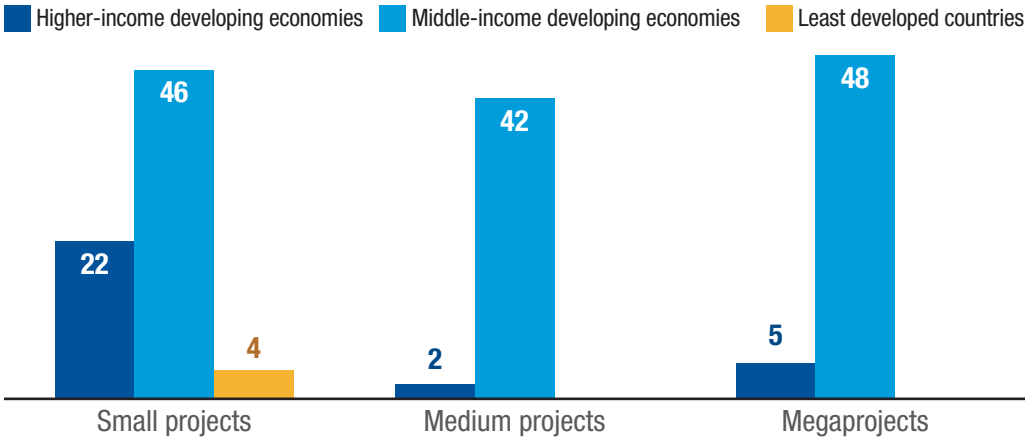
Table IV.7
International project finance in data centres, by investor source and country grouping, 2015–2024
(Percentage)

		Global		Developing countries	
Type of project	**Unit**	Domestic	International	Domestic	International
Total	**Number**	**47**	**53**	**48**	**52**
	Value	**41**	**59**	**55**	**45**
Public	Number	7	5	14	4
	Value	4	11	13	6
Private	Number	40	48	34	48
	Value	37	48	42	39

Source: UNCTAD, based on information from LSEG Data & Analytics.

Note: A project is defined as public if the ultimate owner of the project company is a government agency or a State-owned enterprise or has an equity participation from the host State. A project is defined as international if at least one sponsor is foreign.

Figure IV.15
Middle-income developing economies have attracted the largest share of investment in data centres
Projects by income group and project size, 2020–2024
(Billions of dollars)



Source: UNCTAD, based on information from The Financial Times Ltd, fDi Markets (www.fdimarkets.com).
Note: Low-income countries are least developed countries.

During 2020–2024, 16 companies have announced investment in data centres in LDCs, focusing on small-scale projects (with a total value of $12.6 billion) and medium-scale projects (with a total value of $2.5 billion) in middle-income countries such as Malaysia, Mexico and Nigeria.

Notable investors include Djibouti Data Centre (Djibouti), Econet Global (Mauritius), Hiranandani Developers (India), Paratus Africa Group (Namibia) and ST Digital (Cameroon). Other investors focus on LDCs, where CloudFlare, Digital Realty Trust and Raxio Group (all United States) and Vodafone Group (United Kingdom) have announced greenfield projects totalling $2.07 billion.

North American investors lead digital services projects in developing economies, with major companies such as Amazon, Cloud HQ and Oracle (all United States) focusing on data centres (figure IV.16). Amazon concentrates its investment in four countries: India, Malaysia, Saudi Arabia and Thailand. Companies such as CITIC Group (China) and Temasek Holdings (Singapore) are significant investors in data centres, and GIC (Singapore) leads investment in digital services in India. Asian companies dominate investment in e-commerce, with Alibaba (China), ESR and Morning Express and Logistic (both Hong Kong, China) and Pluugin Ecommerce (United Arab Emirates), and are investing in other Asian economies.

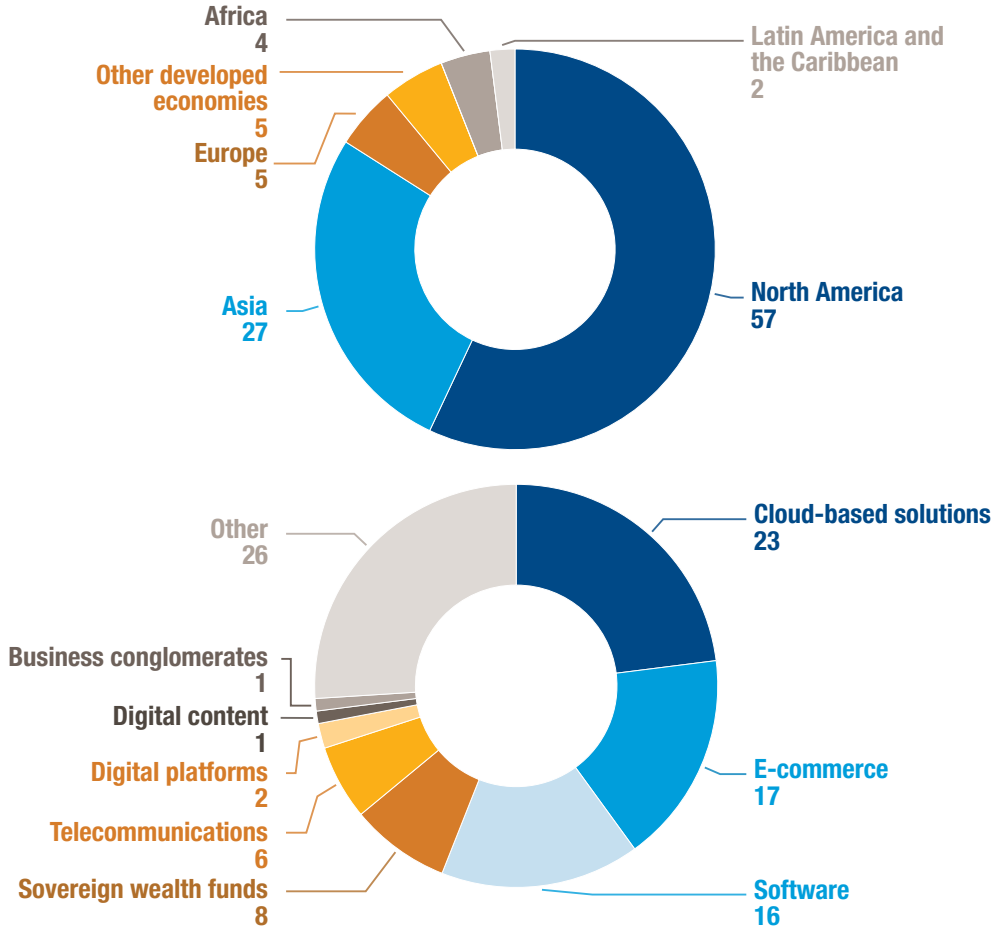
iii. Digital services and solutions

Developed economies attracted 60 per cent of announced greenfield projects in digital services and solutions between 2020 and 2024 (figure IV.17). Regions with connectivity gaps, such as in Africa and parts of Latin America and the Caribbean, lag in greenfield investment. Brazil is a notable recipient in Latin America, ranking third among developing economies. India ($54 billion) and Singapore ($12 billion) are key investment hotspots because of their strong IT service sectors and their strategic positions in global digital supply chains.

Fintech – the application of technology to enhance financial services – holds significant potential to advance development.

Figure IV.16
Cloud-based solutions companies from the United States are the main investors in data centres

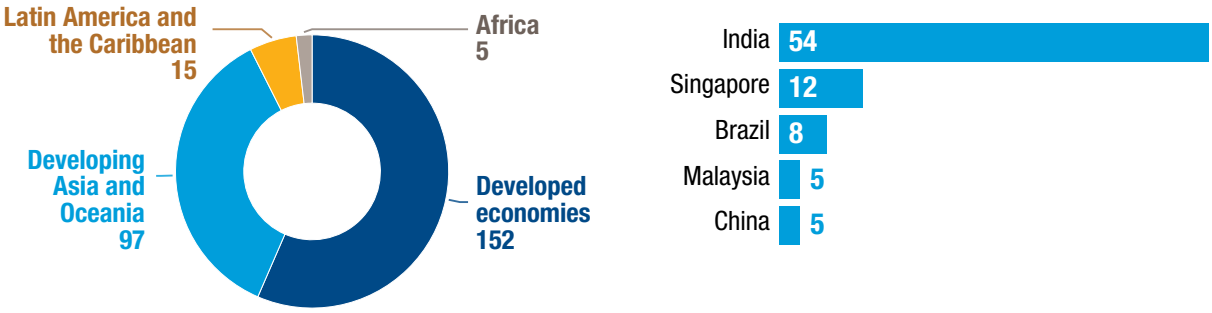
Value of greenfield investment in data centres in developing economies by investor home region and sector, 2020–2024
(Percentage)



Source: UNCTAD, based on information from The Financial Times Ltd, fDi Markets (www.fdimarkets.com).

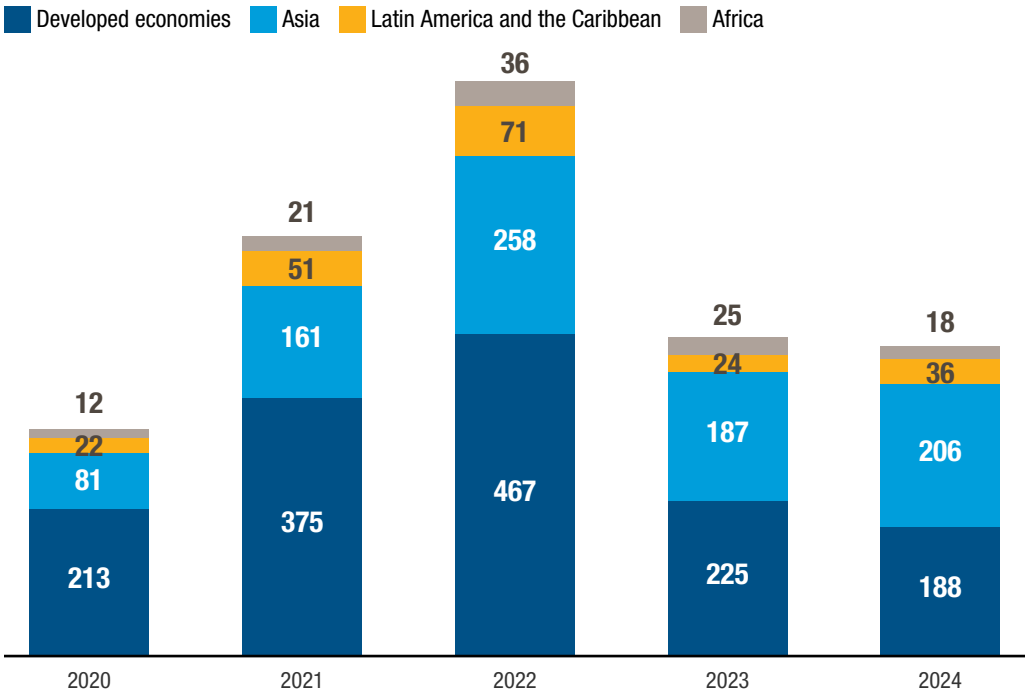
By improving efficiency, accessibility and affordability, fintech can expand financial inclusion, empower underserved populations and foster economic growth. The COVID-19 pandemic accelerated this trend, as lockdowns and store closures spurred the adoption of digital financial solutions. Emerging markets in Asia and in Latin America saw a notable increase in fintech-related greenfield projects, driven by the rise of e-commerce and growing financial inclusion. In 2024, developing Asia saw 206 project announcements, surpassing the 188 in developed economies. Latin America had 36, while Africa faced challenges with only 18 (figure IV.18).

Figure IV.17
Developing Asia attracts more than one third of investment in digital services and solutions
Announced greenfield projects in digital services and solutions by region and top five host developing economies, 2020–2024
(Billions of dollars)



Source: UNCTAD, based on information from The Financial Times Ltd, fDi Markets (www.fdimarkets.com).
Note: Digital services and solutions include e-commerce, foundational technologies (software and the like), digital services and payment solutions (such as fintech, agritech, and healthtech), and AI, automation and R&D.
Abbreviations: AI, artificial intelligence; R&D, research and development.

Figure IV.18
Surge in fintech projects in developing economies: Asia leads the way
Fintech projects by destination region or economic grouping
(Number)



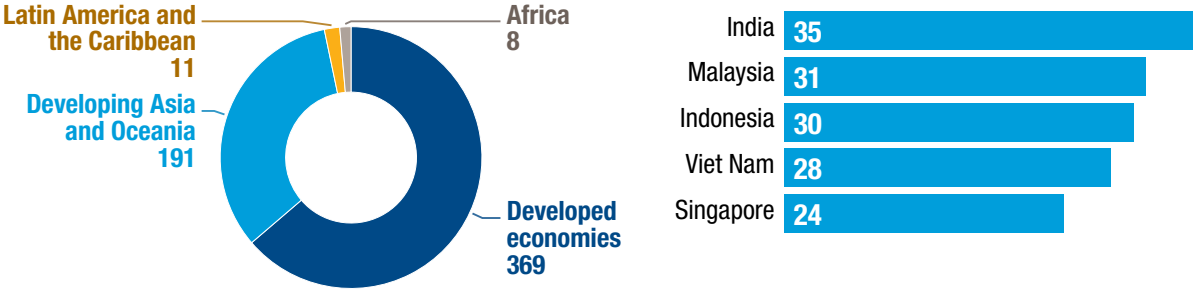
Source: UNCTAD, based on information from The Financial Times Ltd, fDi Markets (www.fdimarkets.com).

In today's global economy, secure and efficient payments infrastructure is critical for enabling cross-border transactions and investment. Fast, reliable fund transfers build trust between investors and host countries, strengthening investor confidence. Recognizing this, public institutions are increasingly investing in digital public infrastructure. Despite progress – such as 90 per cent of cross-border payments reaching beneficiary banks within an hour (SWIFT, 2024) – retail transactions still face delays caused by outdated market practices. Addressing these inefficiencies is key to improving the investment climate. The growing adoption of the International Organization for Standardization's ISO 20022 for financial services has enhanced transparency, allowing financial institutions to identify frictions, improve decision-making and drive innovation. For emerging economies, leveraging this data-driven approach is vital to streamline payments and attract foreign investment.

iv. Digital equipment manufacturing

Developed economies attract the highest levels of greenfield investment in ICT manufacturing – totalling $369 billion – because of their strong high-tech manufacturing base and supportive policies (figure IV.19). Among developing regions, Asia is the primary growth hub, attracting $191 billion in investment between 2020 and 2024. India and South-East Asia have substantial inflows for their integration into global supply chains and robust manufacturing capabilities.

Figure IV.19
Developing Asia attracts the majority of investment in ICT manufacturing
Announced greenfield projects in ICT manufacturing by region and top five host developing economies, 2020–2024
(Billions of dollars)



Source: UNCTAD, based on information from The Financial Times Ltd, fDi Markets (www.fdimarkets.com).

Africa and Latin America attract only $8 billion and $11 billion, respectively, in ICT equipment manufacturing, which is critical for industrial development.

The underlying analysis reveals that MNEs specializing in equipment, devices and components, particularly semiconductor manufacturers such as Nvidia (United States), have grown significantly with the rise of the digital economy and AI. Asian MNEs, especially companies such as Hon Hai, TSMC, UMC and Vanguard (all Taiwan Province of China) along with investors such as Huawei and Lenovo (both China), lead investment in ICT manufacturing in developing economies, accounting for more than 40 per cent of investment from 2020 to 2024. Investment in communication equipment and components is concentrated, with the top 10 investors holding 74 per cent of global project value. North American firms such as Amazon and Apple (both United States) dominate ICT manufacturing services in countries such as India, Singapore and South Africa.

3. Drivers and determinants

The digital economy includes a wide range of industries from equipment manufacturing to service provision (see figure IV.1), and the drivers and determinants of international investment in each industry are different. At the firm level, digital MNEs' motivation and capability for international investment has been enhanced by the rapid advancement of digital technologies, while industry-specific market-, efficiency- and asset-seeking motives continue to drive investment (see also WEF, 2020).

In ICT equipment manufacturing, international investment still follows the basic pattern of efficiency-seeking FDI, with production cost as a main factor in location decisions; however, supply chain security and resilience have become increasingly important factors. In high-end ICT, geopolitical considerations have started to dominate. With digital MNEs placing greater emphasis on building up computing power for AI, international investment in data centres has been rising rapidly, and the power supply of the host country has become an important factor in investment decisions. In the meantime, investment by global e-commerce enterprises focuses more on the construction of international logistics systems, and storage facilities have become a key area of foreign investment.

For various types of digital service enterprises, a major determinant of international investment is the quality and supply of the labour force, especially in terms of digital skills. In their international operation, these enterprises rely increasingly on intangible assets, platform-based delivery modes and data-driven business models (UNCTAD, 2017). While the normal drivers and determinants of FDI apply universally, their importance varies across digital industries and different stages of the digital value chain. Overall, in shaping FDI flows in the digital economy, four main factors stand out: infrastructure (both digital and basic, such as electricity), digital capacities and resources, regulatory framework and market conditions; another factor is the business environment).

ICT equipment manufacturing. FDI in ICT goods manufacturing follows traditional patterns of FDI attraction, with added emphasis on technology integration and supply chain precision. Key factors include cost efficiency, logistics access, policy incentives and access to skilled technical workers. Countries need to provide stable industrial policies, trade facilitation and links to global production networks. These activities often cluster in industrial zones or special economic areas with well-developed infrastructure and services.

ICT infrastructure. Investment in telecommunications networks, cloud services and data centres focuses on expanding connectivity. Key drivers include reliable broadband, electricity and

spectrum access, and transparent licensing procedures. Investors consider policy consistency, digital infrastructure taxation, opportunities for project financing, risk-sharing and PPPs. Top priorities are the ease of obtaining licenses, skilled engineers and regional coordination. Given the high upfront costs of this type of investment, countries should offer a stable operating environment and streamlined regulatory processes.

Digital services and solutions. Applications such as e-commerce, digital solutions and fintech depend on consumer demand, financial inclusion and digital technology adoption. Investor interest grows with widespread mobile usage, trust in digital transactions and supportive regulatory frameworks. Key factors include start-up support, digital payment systems and responsive financial regulators. In emerging markets, FDI in digital services and solutions has a prominent role, driven by dynamic entrepreneurial ecosystems and access to early-stage funding.

AI, automation and R&D. FDI in the most advanced segment of digital services and solutions – software development, AI and automation – is concentrated in countries that have strong digital capabilities and supportive innovation systems. This type of investment relies on high-skilled labour, quality data sets, legal frameworks for intellectual property (IP) protection, data governance regulation and platform competition. Investors seek connections to research institutions, venture capital and public R&D support. Data security, copyright protection and privacy regulations are key factors in location decisions.

In addition, openness to trade and regional economic integration – particularly for some types of FDI, such as ICT goods manufacturing, e-commerce logistics and digital services – are important enablers, alongside investment-specific factors. Digital MNEs rely on importing intermediate inputs and exporting goods or services across borders. Trade policies that reduce barriers, facilitate customs procedures and enhance market access can significantly influence investment decisions and strengthen linkages to global value chains (WTO et al., 2023).

As shown in figure IV.20, different types of FDI in the digital value chain are driven by distinct sets of enablers. Countries are not equally positioned across all stages: their ability to attract specific types of FDI depends on the enabling conditions they can offer across infrastructure, regulation, market readiness and digital capabilities, all of which are closely linked to their level of development. These differentiated investment profiles form part of a broader digital development chain, one that reflects where countries stand in attracting investment in the digital economy, as well as how they can harness such investment to drive broader digital transformation.

LDCs primarily attract FDI in ICT infrastructure, focused on basic connectivity and often supported by donors or public operators. Middle-income developing economies present more diverse profiles, engaging in ICT manufacturing and attracting growing investment in digital services, driven by expanding Internet access and emerging innovation ecosystems. In some cases, improvements in regulation and digital skills are facilitating a shift towards innovation-driven segments. Higher-income economies, by contrast, are most specialized in digital services and innovation activities such as software, platforms and AI, supported by advanced skills, strong data ecosystems and robust governance frameworks.

For developing countries, capturing opportunities along the digital development chain requires deliberate and targeted policy action. Priorities include investing in digital infrastructure, advancing digital skills, strengthening regulatory frameworks and fostering innovation ecosystems. By aligning FDI attraction with their comparative advantages and development objectives, countries can progressively integrate into more complex and value adding segments of the digital economy.

Figure IV.20
Drivers and determinants of FDI in the digital economy – summary view

Types of FDI	Drivers and determinants: Enabling infrastructure	Digital capabilities and resources (skills, data access)	Digital regulation	Market conditions and business environment
ICT manufacturing	Industrial zones, energy and logistics infrastructure, connectivity	Skilled technical workforce, ability to integrate into production networks	Trade and investment policies, product safety and standards	Cost competitiveness; local supplier base, policy stability, export platforms
ICT infrastructure	High-speed broadband, power reliability, data centres, spectrum access	Telecommunications engineers, cloud professionals, basic data operations personnel	Transparent licensing, spectrum policy, infrastructure-sharing rules	Demand for connectivity, public-private partnerships, stable investment climate
Digital services and solutions	Mobile coverage, Internet access, payment systems	Digital entrepreneurs, UX/UI skills, early-stage innovation hubs	Consumer protection, fintech rules, interoperability standards	Growing user base, SME digitalization, startup ecosystems, access to finance
AI, automation and R&D	Advanced computing infrastructure, cloud platforms	AI engineers, data scientists, cybersecurity professionals; access to quality data set	IP rights, data governance, cross-border data rules, competition policy	R&D incentives, venture capital, innovation clusters, university–industry linkages

Source: UNCTAD.

4. Development implications

International investment in the digital economy has considerable developmental effects, such as providing investment and finance, enhancing productivity and creating jobs. In host developing countries, it can play an essential role in the development of digital infrastructure, such as telecommunications networks, broadband access ports and data centres, and the provision of critical services to underserved populations. In addition, international investment in digital industries can help enhance human resources, foreign market access and digital transformation in the host economy. Nevertheless, there are various potential risks, including market dominance, environmental impacts and regulatory challenges. The final outcome depends on a country's digital maturity, its institutional setting and its regulatory frameworks.

a. Direct contributions of FDI in the digital economy

Digital investment is crucial for economic growth and development (UNCTAD, 2017). AI, data analytics, the Internet of Things (IoT) and blockchain drive change in economies, enhancing productivity and addressing challenges such as food security, healthcare access and climate resilience. As highlighted in the *2024 Digital Economy Report* (UNCTAD, 2024a), business-to-business e-commerce sales grew nearly 60 per cent from 2016 to 2022, reaching $27 trillion.

Infrastructure is critical for digital development, especially in emerging economies with connectivity gaps. Investing in ICT infrastructure and 5G is critical to bridging the digital divide. Digital exclusion limits access to education, healthcare and financial services, exacerbating disparities and limiting economic opportunities. Investment in digital infrastructure and services improves the digital inclusion of marginalized communities.

Policymakers can prioritize investments and policies to maximize benefits while addressing inequality, data privacy and cybersecurity. Different kinds of platforms promote digital inclusion by providing markets, information and services. E-commerce platforms empower small businesses and entrepreneurs, social media facilitates knowledge-sharing, and cloud services offer scalable solutions for start-ups and SMEs. These platforms foster innovation and diversification, reducing transaction costs and increasing market efficiency, contributing to broader economic development.

While not the focus of this report, the broad scope digital economy uses digital applications to address sector-specific development goals. Healthtech and edtech expand access to healthcare and education, reducing inequalities. Smart cities and grids optimize resource management and energy efficiency, supporting sustainable urban development. Agritech enhances agricultural yields and rural incomes, helping reduce poverty and improve food security. These applications can accelerate progress towards the Sustainable Development Goals, more than 70 per cent of which have been identified as possible to achieve through digital solutions (ITU and UNDP, 2023).

b. Impact of FDI in the digital economy on sustainable development

The growing digital divide and low Internet usage in developing countries, in particular LDCs, risk hindering progress towards the Sustainable Development Goals. Investment is needed in affordable Internet access, online safety, digital literacy and language-accessible content. Recent research highlights disparities in the digital divide (UNDP, 2024; ITU, 2025). Lack of Internet access limits opportunities, educational resources and services, entrenching poverty. Women are affected disproportionately, having lower usage rates than men. High costs and inadequate infrastructure are barriers.

In low-income countries, FDI acts as a critical enabler for developing digital infrastructure and services. These countries face constraints such as insufficient domestic capital, limited access to advanced technologies and lack of skilled human resources. Foreign investment thus is essential for building broadband networks, data centres and e-commerce logistics facilities.

FDI facilitates access to advanced technologies such as AI, cloud computing and fintech solutions. Digital MNEs raise technological standards and create opportunities for knowledge transfer to local firms and workers, leading to improved productivity and innovation capacity.

Developing the digital economy through FDI opens doors to global markets. E-commerce platforms enable local SMEs to integrate into international production networks, amplifying their reach and enhancing competitiveness.

However, FDI in the digital economy has potential downsides. The market power of global platforms can lead to negative effects on market competition, affecting small local players and traditional sectors such as retail. The business models of digital MNEs often enable aggressive tax minimization strategies, undermining efforts to mobilize local resources.

The United Nations Framework Convention on International Tax Cooperation, currently in negotiation, aims to strengthen inclusiveness and equity in global tax governance.

In the Base Erosion and Profit Shifting project led by the OECD and the Group of 20, Pillars One and Two focus on addressing tax challenges posed by digitalization, including taxation of intangible assets, profit allocation to market jurisdictions and introduction of a 15 per cent global minimum corporate tax. In contrast, the United Nations process is intended to offer a broad and inclusive intergovernmental platform. In many developing countries, it is seen as a way to ensure more fair outcomes in the taxation of MNEs, in particular those operating in the digital space, and to align international tax cooperation with development priorities.

Technological advances in artificial intelligence and digital platforms are contributing to innovation in public service delivery, particularly in developing economies. For example, in Malaysia the Digital Economy Framework Agreement of the Association of Southeast Asian Nations (ASEAN) aims to promote open-source and shared digital infrastructure for rural digital connectivity and encouraging responsible, climate-aligned digital investment in line with ASEAN sustainability goals. Open-source models, such as Meta's Llama (United States), have been deployed in the Asia-Pacific region to support governments in strengthening administrative efficiency, improving healthcare diagnostics, and preserving cultural assets. Secure on-premise implementation has facilitated compliance with data protection standards, as illustrated by its use in Pakistan's health sector (Meta and Deloitte, 2025).

Other initiatives by multinational enterprises also contribute to inclusive digital development in social areas. Google.org has supported efforts to expand digital literacy and Internet access in underserved areas (Google.org, 2021). Microsoft's AI for Good programme applies machine learning solutions to domains such as healthcare, environmental sustainability, and accessibility, while its Global Skills Initiative promotes digital upskilling (Kshirsagar et al., 2021; Microsoft, 2025). Similarly, Amazon Web Services' Imagine Grant supports non-profit and educational institutions in using cloud technologies to enhance service delivery. According to company reports, Chinese technology firms also play a growing role: Tencent has invested in rural digital inclusion through WeChat and its philanthropic foundation, and Alibaba's Rural Taobao connects agricultural producers and small enterprises to e-commerce platforms, fostering local economic development (Tencent, 2024; Alibaba, 2025).

Gender inclusion in the digital economy has seen gradual progress. From 2020 to 2023, the share of women employed in the ICT sector increased by 7.7 per cent annually. Initiatives such as Women Who Code (which operated in 145 countries until it announced its closure in April 2024) and PrograMaria (Brazil) have expanded opportunities for women. The gender gap in mobile Internet access in low- and middle-income countries narrowed to 15 per cent in 2023. Ongoing efforts to mitigate algorithmic bias and support diversity in AI development are contributing to more inclusive digital ecosystems (ITU, 2023).

The Global Digital Compact (part of the Pact for the Future adopted at the 79th United Nations General Assembly) aims to ensure that women and girls can access the benefits of the digital economy. It focuses on bridging the digital divide and promoting gender equality with commitments to sustainable development and human rights. The Pact emphasizes international cooperation, including for an inclusive digital landscape. The 2025 Political Declaration of the Commission on the Status of Women stresses closing the digital gender divide, investing in gender data and ensuring that women have access to science, technology, engineering and math education, while eliminating digital violence and harassment.

c. Impact of the digital economy on environment

The digital economy has significant environmental impacts. Recent studies have identified several critical areas where the digital economy intersects with environmental sustainability, including through increased consumption of energy and increased production of electronic waste.

The rapid expansion of digital infrastructure has significantly boosted global energy demand. In 2024, demand grew by 2.2 per cent, with the power sector experiencing a 4.3 per cent surge in the context of record temperatures and growing demand for electrification and digitalization. The consumption by data centres alone of approximately 200 billion litres of water a year for cooling purposes poses a rising risk to environmental sustainability and water security. In 2020 the ICT sector emitted an estimated 0.69 to 1.6 gigatons of carbon dioxide equivalent, corresponding to 1.5 per cent to 3.2 per cent of global greenhouse gas emissions that year. Between 2010 and 2022, electronic waste from screens and small IT equipment rose 30 per cent, reaching 10.5 million tons, according to the comprehensive study of the environmental impact of the digital economy contained in the UNCTAD *2024 Digital Economy Report* (UNCTAD, 2024a).

Digital technologies such as AI and IoT can enhance energy efficiency by optimizing consumption in buildings, transportation and industrial processes. Advanced technologies such as liquid cooling and AI can optimize water resources. Smart grids and energy management systems can reduce waste and improve the integration of renewable energy sources. As lithium, cobalt and rare earth elements are essential for digital devices and renewable energy technologies, efforts to recover critical minerals from nontraditional sources and increase recycling are being explored. Cloud computing and virtualization can reduce the need for physical hardware.

Digital platforms can facilitate the sharing economy, reducing resource-intensive production (e.g. ride-sharing apps, online marketplaces for second-hand goods). Data-driven technologies such as AI and IoT can improve climate change monitoring by providing real-time data on environmental conditions.

Blockchain technology can create transparent systems for tracking carbon credits, encouraging investment in green projects. Digital finance platforms can facilitate investment in renewable energy and sustainable infrastructure.

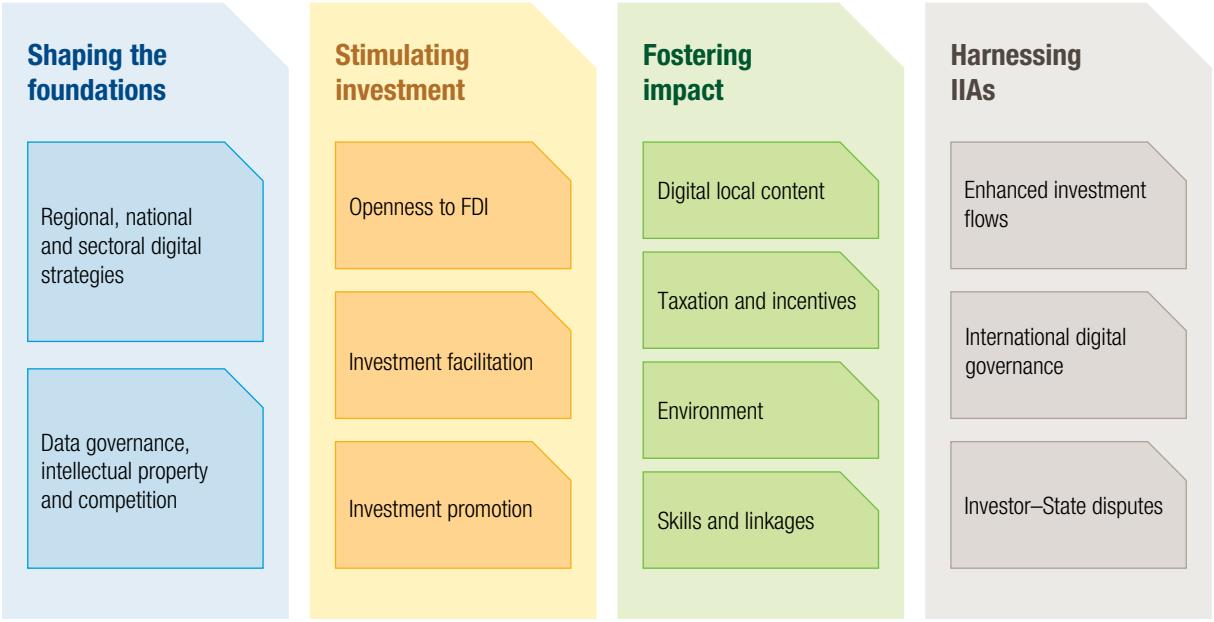
C. Policies to leverage international investment in the digital economy

In developing countries, national digital strategies have become more widespread and comprehensive; however, integration with broader development, industrial and environmental goals remains limited. Many strategies overlook the role of FDI, and investment promotion agencies (IPAs) are seldom involved in strategy design – highlighting the need for more coherent, investment-oriented digital policy frameworks. Restrictions on FDI in core digital infrastructure and regulatory gaps in key areas such as data governance and IP protection are key bottlenecks to attracting FDI in the digital economy. Moreover, in many developing countries the level of digital skills calls for initiatives to enhance local capabilities through talent attraction, knowledge transfer and business linkages, including with the use of FDI.
At the international level, new-generation international investment agreements (IIAs) increasingly facilitate, promote and liberalize investment in the digital economy. They include cooperation provisions aimed at promoting investment in skills development, digital literacy and ICT infrastructure. In addition, new-generation IIAs can support technology transfer on mutually agreed terms to developing economies in areas relevant to the digital economy. The inclusion of specific commitments on AI, e-payments, data flows and cybersecurity is also on the rise. However, more can be done to include binding development-focused provisions to enhance digital skills training, SME support and digital infrastructure development.

This section analyses key elements of the national and international policy framework for international investment in the digital economy. The analytical approach is articulated through four pillars – shaping the foundations, stimulating investment, fostering impact and harnessing IIAs (figure IV.21). It also reflects policy lessons from 15 developing countries, referred to in this chapter as the "top 15 countries". These countries were selected on the basis of the maturity of their policy framework for the digital economy (in data from ITU, they are classified as "generation 4" in its ICT Regulatory Tracker and "advanced" or "leading" in its digital development score or G5 Benchmark). They are also characterized by a significant presence of FDI in digital economy sectors, with cumulative announced FDI in these sectors representing more than 15 per cent of the total cumulative FDI announced over the period from 2015 to 2024.[1]

[1] The 15 countries are Armenia, Brazil, Colombia, Costa Rica, Kenya, Mexico, Nigeria, Pakistan, Peru, Rwanda, Saudi Arabia, Singapore, South Africa, Thailand and Türkiye. Information provided for these countries is based on analysis of policies, laws, regulations and information available on official government websites.

Figure IV.21
National and international policies for investment in the digital economy



Source: UNCTAD.

Abbreviations: FDI, foreign direct investment; IIA, international investment agreement.

1. Shaping the foundations

a. Digital strategies

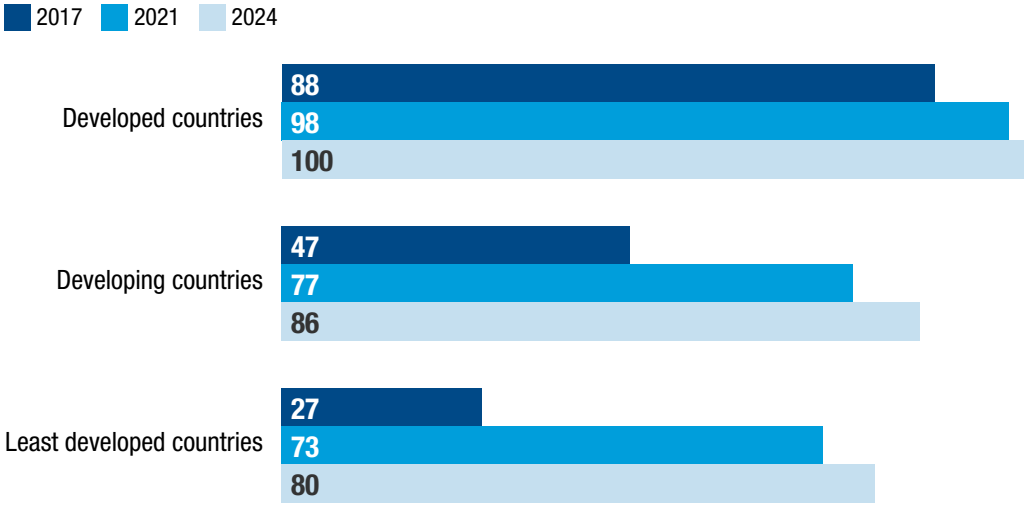
A clear digital strategy enhances transparency, regulatory stability and predictability, all crucial for investors in the digital economy (Stephenson, 2020). It provides a road map for expanding digital infrastructure, enhancing innovation ecosystems and creating an enabling regulatory environment for both domestic and foreign investors.

Significant progress has been made in adopting digital strategies over the past decade. In 2017, almost 90 per cent of developed countries had a national digital strategy, compared with fewer than half of developing countries and about a quarter of LDCs. By 2024, 86 per cent of developing countries and 80 per cent of LDCs had a national digital strategy, while 100 per cent of developed countries had one (figure IV.22).

Several developing countries that have been successful in attracting international investment in the digital economy adopted digital strategies early. Examples include Kenya (2005), Peru (2006), Singapore (2006), Armenia (2008) and Colombia (2010). This suggests that long-term strategic vision and planning are essential for developing the digital economy through FDI.

Analysis of more than 100 national digital strategies and earlier findings from the *World Investment Report 2017* (UNCTAD, 2017) suggest that national digital strategies have improved significantly in quality and sophistication. Earlier strategies were often broad and vague, with considerable variation across countries. Today, they are generally more detailed and aligned with clear objectives. By 2024, most countries – 86 per cent of developed countries and 92 per cent of developing countries – had recognized the need for a robust regulatory framework that keeps pace with digital advancements. Cybersecurity and data privacy now feature prominently.

Figure IV.22
Developing countries closing the gap in national digital strategy adoption
Share of countries that have adopted a digital strategy
(Percentage)



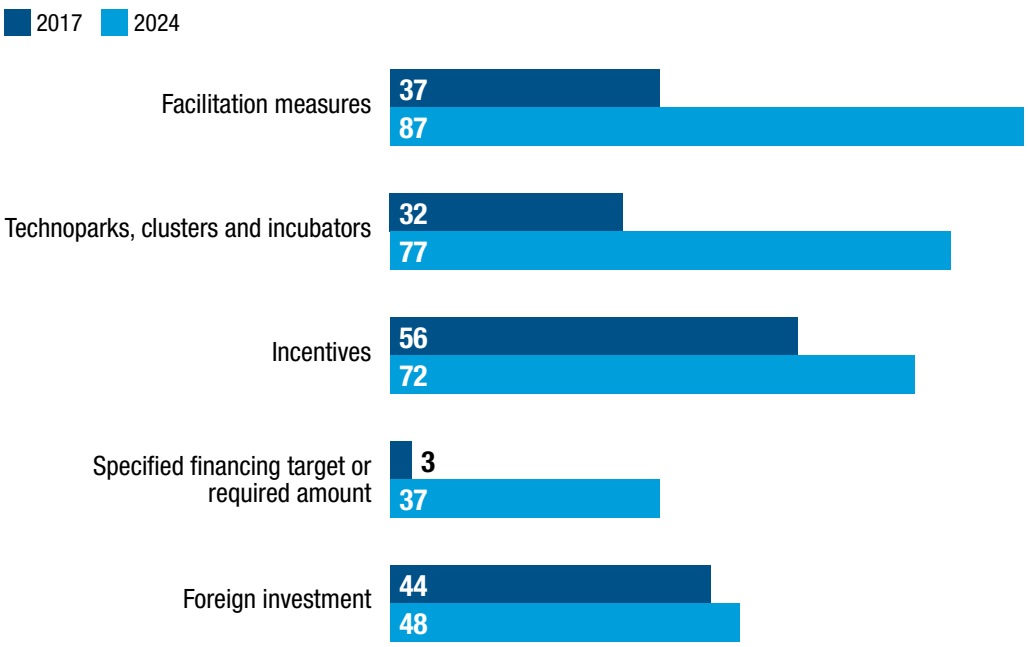
Source: UNCTAD, based on UNCTAD (2017) and ITU G5 Benchmark database.
Abbreviations: G5, fifth generation; ITU, International Telecommunication Union.

Recent digital strategies also provide more detailed plans for promoting the digital economy through investment. In 2017, fewer than 40 per cent of the strategies included investment facilitation measures; by 2024, this figure had risen to almost 90 per cent. These measures include e-government solutions for business registration and licensing, visa facilitation for qualified professionals and implementation of start-up support programmes.

The establishment of technoparks, incubators, SEZs and targeted clusters to foster technological development and enhance innovation ecosystems has become widespread (featured in 77 per cent of strategies). Similarly, incentives for investment in the digital economy now feature in 72 per cent of national strategies, a rise from 56 per cent in 2017 (figure IV.23). While the prevalence of incentives in developing countries has remained relatively stable (62 per cent in 2017 versus 60 per cent in 2024), developed countries have significantly expanded their use, with their inclusion in strategies increasing from 48 per cent to 83 per cent over the same period. This shift reflects the growing emphasis on industrial policies as a strategic tool for fostering digital transformation.

Despite the focus on private investment in strategies, references to FDI have not become more prevalent. IPAs are mentioned in just 20 per cent of digital strategies in developing countries and 11 per cent in developed countries, highlighting an opportunity for a more structured approach to investment promotion. In addition, references to FDI are often general and few strategies include measures to attract investment in sectors such as ICT infrastructure or AI, or types of investment such as venture capital, reflecting low coordination with industrial policies. Notable exceptions exist; for instance, several strategies from countries in Latin American and the Caribbean stress attracting international investment in ICT infrastructure. In Asia, the digital economy blueprint of Malaysia focuses on attracting FDI in catalytic sectors such as cybersecurity, AI and data analytics (box IV.6). Pakistan aims to attract FDI in e-commerce.

Figure IV.23
Greater emphasis on investment promotion in digital strategies, but limited role for foreign direct investment
Investment-related aspects of national digital strategies
(Percentage of strategies)



Source: UNCTAD.

Qatar has an FDI attraction programme for the digital economy, and Singapore promotes FDI in its AI centres of excellence. In Africa, Morocco targets AI actors and venture capital investors.

Sectoral strategies can serve as effective promotion tools by highlighting a country's commitment to development, clarifying regulatory aspects and laying out investment promotion measures. However, only a few strategies include a specific FDI dimension. In Costa Rica, the national digital strategy is complemented by sectoral plans, including a national plan for science, technology and innovation. A dedicated road map for the semiconductor sector aims to position the country as a key player in the United States semiconductor supply chain. The India Semiconductor Mission aims to develop the semiconductor ecosystem in that country and integrate it into the global supply chain through incentives and facilitation measures. Chile has also introduced a National Data Centres Plan to attract foreign investment.

AI strategies have surged in recent years. In 2017, only 2 per cent of countries had adopted an AI strategy. By 2023, the share of countries with an AI strategy had risen to 38 per cent. However, significant regional variations exist: only 17 per cent of countries in Africa, 24 per cent in Latin America and the Caribbean, and 34 per cent in developing Asia and the Pacific had adopted an AI strategy by 2023, compared with 75 per cent of developed countries.

Regional digital strategies have also emerged as important frameworks for guiding national digital policy development, ensuring policy coherence across borders and fostering regional cooperation on digital infrastructure, thereby enhancing the attractiveness of a region to FDI. They facilitate economies of scale, reduce transaction costs and enable the cross-border flow of digital services. By aligning standards, facilitating interoperability and encouraging joint policy action, regional strategies help build a competitive environment for investment in the digital economy.

Box IV.6
Malaysia: Approach to attracting investment in the digital economy

The first digitalization initiative in Malaysia was the Multimedia Super Corridor in 1996, following the establishment of the Malaysia Digital Economy Corporation, a government agency dedicated to digital growth and investment promotion in the digital economy. The country's digital development experience has built on five core pillars that underpin its digital transformation strategy:

A clear national vision, backed by top-level political commitment, guides digital development. The Malaysia Digital Economy Blueprint (MyDIGITAL) and the New Industrial Master Plan 2030 provide strategic and coordinated direction and a clear blueprint for policy action.

Transparent and adaptive regulations support data privacy, cybersecurity, consumer protection, cross-border e-commerce and online dispute resolution mechanisms.

Targeted investment promotion and facilitation through initiatives such as DE Rantau and the Digital Catalytic Programmes helped attract more than RM161.9 billion (approximately $38 billion) in investment in the digital economy between 2021 and 2024, including from Amazon, Microsoft and Nvidia (all United States).

Infrastructure development and digital inclusion are pursued in tandem. The JENDELA (Jalinan Digital Negara, or Digital Country Network) programme has expanded broadband to more than 97 per cent of populated areas. More than 1,000 digital economy centres support access to digital tools, training and e-commerce, particularly for youth and women.

Ecosystem-building focuses on connecting enterprises to platforms, finance, skills and global markets, going beyond fiscal incentives to attract investment and develop local firms.

The national digital strategy also aligns with the regional goals of the ASEAN Digital Economy Framework Agreement, which aims to develop a $2 trillion digital economy by 2030. As ASEAN chair in 2025, Malaysia is leading efforts to conclude the Agreement and advance high-quality investment in the digital economy linked to inclusive and innovation-driven growth.

Source: UNCTAD, based on Malaysia Digital Economy Corporation website (https://mdec.my/) and official intervention at the 15th Session of the Investment, Enterprise and Development Commission, on 5 May 2025.

While these strategies differ across regions in design, institutional mechanisms and legal status, all provide shared objectives and policy guidelines to influence national policymaking (box IV.7).

However, only 38 per cent of developing countries refer to regional strategies in their national digital strategies, suggesting potential for further policy alignment.

Box IV.7
Regional digital strategies in Africa, Asia, Europe and Latin America and the Caribbean

In **Africa** the regional digital agenda is anchored in the African Union Digital Transformation Strategy (2020–2030), which aims to build an inclusive and integrated digital economy. This is complemented by the Smart Africa Alliance, promoting PPPs in digital innovation. The African Continental Free Trade Area (AfCFTA) Protocol on Digital Trade aims to establish a regulatory framework for cross-border e-commerce and digital services. Regional strategies from the East African Community, Economic Community of West African States and the Southern Africa Development Community support policy harmonization and investment in digital infrastructure.

In **ASEAN** the digital strategy began with ICT-focused master plans aimed at expanding infrastructure and digital access and has since evolved into a plan to build a regional digital economy. The ASEAN Digital Masterplan 2025 and the Bandar Seri Begawan Roadmap promote cross-border digital trade, e-commerce, digital payments and cybersecurity. The ASEAN Digital Economy Framework Agreement aims to establish a legally binding framework for a unified digital market. Malaysia and Singapore have aligned their digital economy policies with ASEAN's broader push for cross-border digital trade, digital payments and e-commerce. Indonesia and Viet Nam have incorporated ASEAN's cybersecurity and digital talent development goals into their national digital agendas.

In **Europe**, the Digital Decade Policy Programme 2030 aims to create an environment favourable to investment and innovation by setting measurable digital development targets for member States in key areas such as skills, infrastructure, business digitalization and public services. The programme mandates national digital road maps, joint monitoring and a framework for multi-country projects.

The Digital Agenda for **Latin America and the Caribbean** provides a non-binding regional framework that helps coordinate national digital strategies. It is structured around three main axes: connectivity and infrastructure, digital governance and innovation. Countries such as Brazil, Chile and Colombia have aligned their policies with its goals, particularly in broadband expansion, AI implementation and digital inclusion.

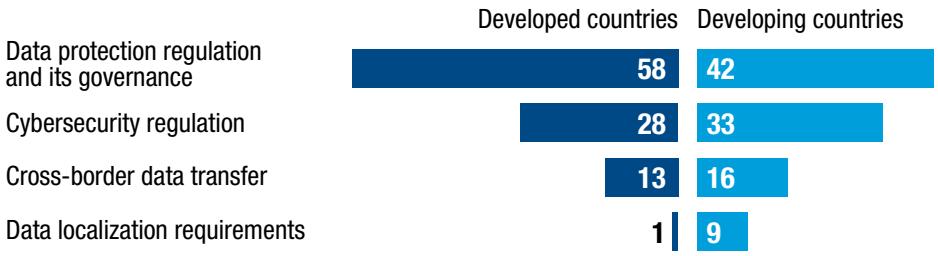
Source: UNCTAD, based on review of the strategies

b. Data governance, intellectual property and competition

Data security and privacy and IP protection are the top regulatory elements that investors in the digital economy care about (Stephenson, 2020). Along with the competition framework, these elements build trust, foster innovation and ensure fair market dynamics. Over the past five years, data governance initiatives represented the largest share of digital policy measures by developed and developing countries (35 per cent and 41 per cent, respectively). These efforts focus on data protection and governance (figure IV.24) at national, regional and international levels (box IV.8). Despite these efforts, many developing countries, particularly LDCs, still lack dedicated data protection and cybersecurity frameworks, unlike developed countries and the top 15 countries (figure IV.25).

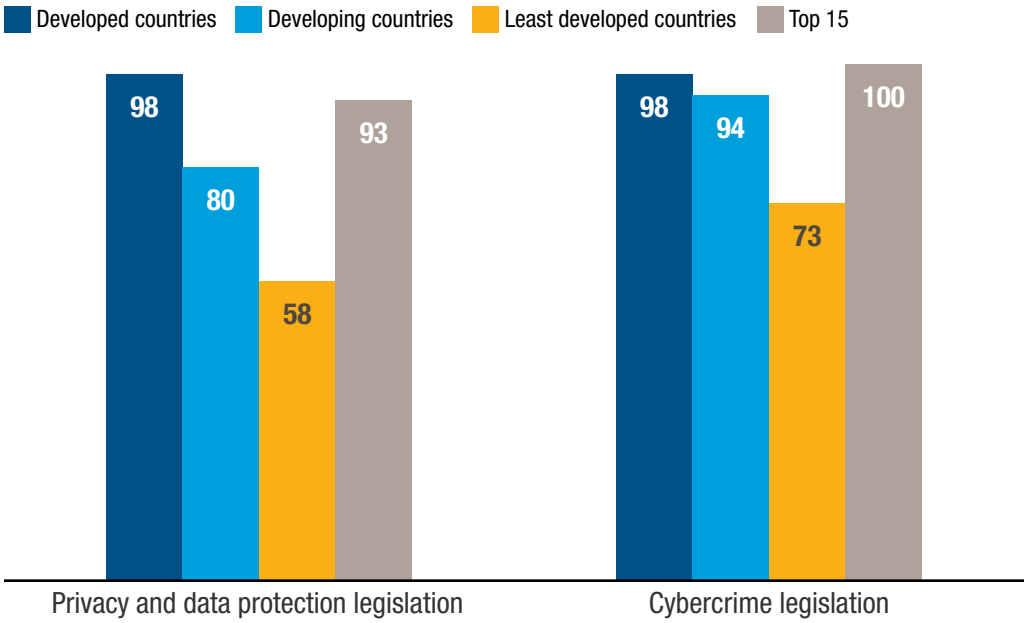
Countries that have a framework focus on the rights of individuals over personal data and the responsibilities of data processors and controllers.

Figure IV.24
Data protection is a key policy concern across all countries
Data governance measures by type and level of development, 2020–2024
(Percentage)



Sources: UNCTAD, Investment Policy Monitor database and Digital Policy Alert initiative of the St. Gallen Endowment for Prosperity through Trade.

Figure IV.25
Many developing countries lack data protection and cybercrime frameworks
Share of countries with legislation on privacy and data protection and cybercrime, by economic grouping, 2024
(Percentage)



Source: UNCTAD, based on the UNCTAD Global Cyberlaw Tracker (https://unctad.org/topic/ecommerce-and-digital-economy/ecommerce-law-reform/summary-adoption-e-commerce-legislation-worldwide).

Box IV.8
Regional and international initiatives for data governance and cybersecurity in the digital economy

The United Nations Global Digital Compact, adopted at the Summit of the Future in September 2024, aims to advance responsible, equitable and interoperable data governance, with commitments on data privacy, security and cross-border data flows. To translate these commitments into practice, the General Assembly mandated that the Commission on Science and Technology for Development establish a Multi-Stakeholder Working Group on Data Governance at All Levels as relevant for development. The Working Group was asked to conduct an inclusive global dialogue and to report back to the General Assembly, no later than its 81st session, with recommendations on foundational principles for equitable data governance; ways to ensure interoperability between national, regional and international data systems; approaches for fair benefit-sharing from data; and options to facilitate safe, secure and trusted cross-border data flows. Comprising 27 State members and 27 non-State members drawn from business, civil society, academia and the technical community, the Working Group serves as the principal multi-stakeholder platform within the United Nations system for advancing data governance.

In cybersecurity, multilateral treaties focus on cybercrime. The Budapest Convention on Cybercrime (2001) was the first multilateral treaty to address cybersecurity issues, criminalizing various forms of cybercrime and outlining measures for data handling and international cooperation in investigations. The United Nations Convention against Cybercrime (2024) prohibits unauthorized access to information systems, establishes frameworks for cross-border cooperation in handling electronic evidence and addresses technology-facilitated sexual violence against children.

Regional instruments include the African Union Convention on Cyber Security and Personal Data Protection (2014), the Arab Convention on Combating Information Technology Offences (2010), the Shanghai Cooperation Organization Agreement on Cooperation in Ensuring International Information Security between the Member States of the SCO (2009) and the Commonwealth of Independent States Agreement on Cooperation in the Fight against Crimes in the Field of Information Technologies (2001).

Source: UNCTAD.

Developing countries focus on establishing or regulating authorities for enforcing data protection laws and reinforcing capacity. On cybersecurity matters, all countries emphasize risk management, consumer data protection, infrastructure resilience and national security. Developed countries address emerging threats such as AI security and post-quantum cryptography, while developing countries prioritize strengthening the legal framework and addressing cybercrime prevention.

Cross-border data flows are crucial for the digital economy, enabling international business operations, innovation and investment. Restrictive or unclear data transfer policies can deter investment and innovation. An effective policy framework must balance personal data protection, national interests and accountability.

Both developed and developing countries have adopted cross-border data transfer regulations, ranging from strict data localization requirements to policies for the free flow of data (box IV.9). National policies depend on technological, economic, social, political, institutional and cultural conditions (UNCTAD, 2021).

Recent years have seen the adoption of data localization requirements, particularly among developing countries. These requirements often focus on specific categories of data, such as government data (e.g. Nigeria and Saudi Arabia), e-payment institutions (e.g. Mexico and Türkiye) and social media (e.g. Pakistan).

Investors in the digital economy seek countries with robust and transparent IP laws aligned with international agreements, such as the Trade-Related Aspects of Intellectual Property Rights (TRIPS) Agreement (under the World Trade

Box IV.9
Cross-border data transfer and localization requirements

Both developed and developing countries use various regulatory models to protect personal data, safeguard national interests and promote accountability in the global data economy. Among the most common mechanisms:

Data localization requirement. Some countries require data to be stored or processed within national borders, particularly for national security. For example, Egypt mandates local hosting for classified government data, and Thailand and Viet Nam impose similar requirements for high-risk data.

Approval or prior notification. Countries may require approval or notification before data can be transferred abroad, especially if the recipient country lacks an adequate legal framework. Algeria and the Russian Federation require notification or approval based on the adequacy of the recipient country's data protection laws.

Adequacy decisions. Countries or regional organizations may determine that a foreign country's data protection regime is adequate, allowing for free data flow. The European Union General Data Protection Regulation, for instance, facilitates the transfer of data to countries that have equivalent protection standards.

Standard contractual clauses or model contractual clauses. These legally binding clauses ensure data protection during international transfers. The European Commission's draft standard contractual clauses are used for transfers to countries where privacy protection is inadequate.

Binding corporate rules. These internal policies are adopted by multinational corporations to enable the lawful transfer of personal data across borders within the same corporate group. These rules are legally enforceable and must be approved by the relevant data protection authority in at least one jurisdiction. For example, in Türkiye the Personal Data Protection Law of 2016 approved binding corporate rules for international transfers.

Other mechanisms include certification or sectoral codes of conduct, which enable organizations to demonstrate compliance with data protection standards as safeguards for transfers to countries without an adequacy decision.

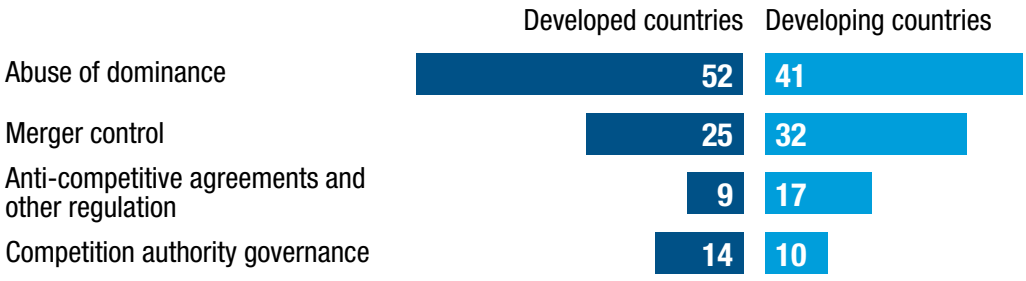
Source: UNCTAD, based on the Digital Policy Alert initiative of the St. Gallen Endowment for Prosperity through Trade.

Organization (WTO)), the World Intellectual Property Organization (WIPO) Internet Treaties, i.e. the WIPO Copyright Treaty and the WIPO Performances and Phonogram Treaty, or with regional regulations. The TRIPS Agreement, adopted in 1994, contains limited references to digital innovations, such as the protection of computer programmes through copyright and layout designs of integrated circuits. Hardware and other components for digital technologies can generally be protected through patents. The WIPO Internet Treaties further define copyrights, protections and exceptions for authors and rights holders regarding computer programmes, digital content and data compilations. As of early 2025, close to 120 countries had ratified these treaties and adapted their national legislation accordingly, including nearly all developed countries, most of the top 15 countries, about 50 per cent of developing countries and 30 per cent of LDCs.[2]

For developing countries, adjusting IP frameworks for the digital economy requires promoting technological innovation, protecting domestic industries, ensuring access to knowledge and complying with international norms. Many countries are adopting a flexible approach to their IP regime to leverage digital transformation while protecting cultural, social and economic interests. Among the top 15 countries, for example, Brazil and Nigeria enhanced copyright laws to address online piracy and digital distribution, Kenya protects traditional knowledge, and Singapore allows copyrighted material for computational data analysis under specific conditions, including lawful access. In view of the widening disparity in IP ownership between developed countries and developing countries – with the former dominating high-value patents in core digital industries – international support for strengthening IP and innovation frameworks in developing countries has become increasingly important.

Foreign investment in the digital economy often raises competition-related concerns beyond traditional market dynamics. Price signals alone are insufficient in defining digital markets because of the markets' multifaceted nature (e.g. data-driven business models, platforms, network effects). Competition is a key concern for both developed and developing countries, with more than a third of digital policy measures adopted in 2020–2024 targeting digital services, e-commerce and platform economies (figure IV.26).

Figure IV.26
Competition measures focus on abuse of dominance in all countries
Digital policy measures on competition, by type and level of development, 2020–2024 (Percentage)



Sources: UNCTAD, Investment Policy Monitor and the Digital Policy Alert initiative of the St. Gallen Endowment for Prosperity through Trade.

[2] Based on WIPO data accessed on 31 March 2025, available at https://www.wipo.int/wipolex/en/treaties/ShowResults?search_what=C&treaty_id=20 and https://www.wipo.int/wipolex/en/treaties/ShowResults?search_what=C&treaty_id=16.

Regulatory efforts by both developed and developing countries focus on preventing data-related abuses by dominant digital platforms (gatekeepers), including self-preferencing and other anti-competitive behaviour. Approaches include adapting traditional competition frameworks, using other legislative frameworks (e.g. privacy and consumer protection laws) or adopting targeted regimes for digital platforms. These include ex ante regulations to capture practices harmful to competition but difficult to establish as infringements under existing frameworks (UNCTAD, 2023a). The most common model for these ex ante regimes is the Digital Markets Act of the European Union.

Merger oversight is a priority, with a focus on revising notification thresholds, preventing "killer" acquisitions by domestic or foreign companies, enhancing enforcement and improving transparency. Several countries have expanded the powers of national regulators and competition authorities through new investigative tools, higher fines and improved assessment of anti-competitive agreements. These developments have important implications for cross-border M&As, as stricter merger controls can increase scrutiny of foreign investors seeking to acquire domestic firms.

While some countries introduce specific regulations for digital platforms, others opt to amend competition laws or use "soft law" approaches. The best option depends on the country's legal tradition, resources, experience, and regulatory culture and objectives.

Data governance, IP and competition are critical for a dynamic digital economy policy framework. Unclear or restrictive frameworks can stifle innovation and favour dominant actors. Countries should adopt data governance and cybersecurity frameworks for secure, lawful and purpose-specific data handling, including in AI systems, and adapt localization approaches to national development goals. A holistic approach is needed for cross-border data transfer regulations, considering domestic and international factors (UNCTAD, 2021).

IP frameworks need strengthening to enhance legal certainty and attract technology-driven investment. LDCs, in particular, need to build capacity not only to design and administer effective IP systems suited to their local needs and circumstances but also to enforce IP protections as part of a credible IP regime (Commonwealth Secretariat and UNCTAD, 2024b). The competition framework could be enhanced by embedding antitrust rules specific to the digital economy, increasing investigative capacity, mandating interoperability standards and instituting mechanisms for continuous market review.

2. Stimulating investment

a. Openness to FDI in the digital economy

The approach to regulating FDI entry in the digital economy varies significantly between developed and developing countries. Developed countries impose fewer foreign equity restrictions but increasingly rely on investment screening mechanisms to address national security concerns, including economic security, technological sovereignty and data protection (UNCTAD, 2023b). As a result, digital economy actors are increasingly subject to investment screening regulations.

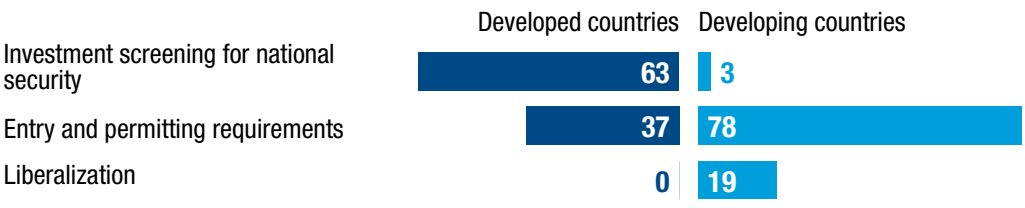
Between 2020 and 2024, investment screening-related measures accounted for more than 60 per cent of digital policy measures governing entry in developed countries (figure IV.27). During the same period, digital sector investments represented 30 to 60 per cent of all investment projects subject to national security screening in countries for which data are available.[3] This trend towards stricter oversight of technology-driven investments is also reflected in the introduction of screening measures targeted to AI and other emerging technologies (see chapter II).

Developing countries tend to regulate FDI entry through foreign equity restrictions, such as bans, joint venture requirements or capital thresholds. Few rely on investment screening for national security purposes; most apply general licensing and permitting requirements that affect all investors.

The OECD FDI Regulatory Restrictiveness Index, which reflects foreign equity limitations, discriminatory screening or approval mechanisms, and operational restrictions, shows that developing countries, including LDCs, maintain a more restrictive approach to FDI across digital sectors, including telecommunications (figure IV.28). The top 15 countries are more open than other developing countries across these digital sectors.

Countries wishing to develop their digital economy through FDI should review foreign equity restrictions, particularly in core sectors, against their strategic objectives and, where appropriate, ease them, while safeguarding national security and public interest. When restrictions to manage the security risks associated with FDI are introduced, it is essential that they are implemented in a clear and transparent manner.

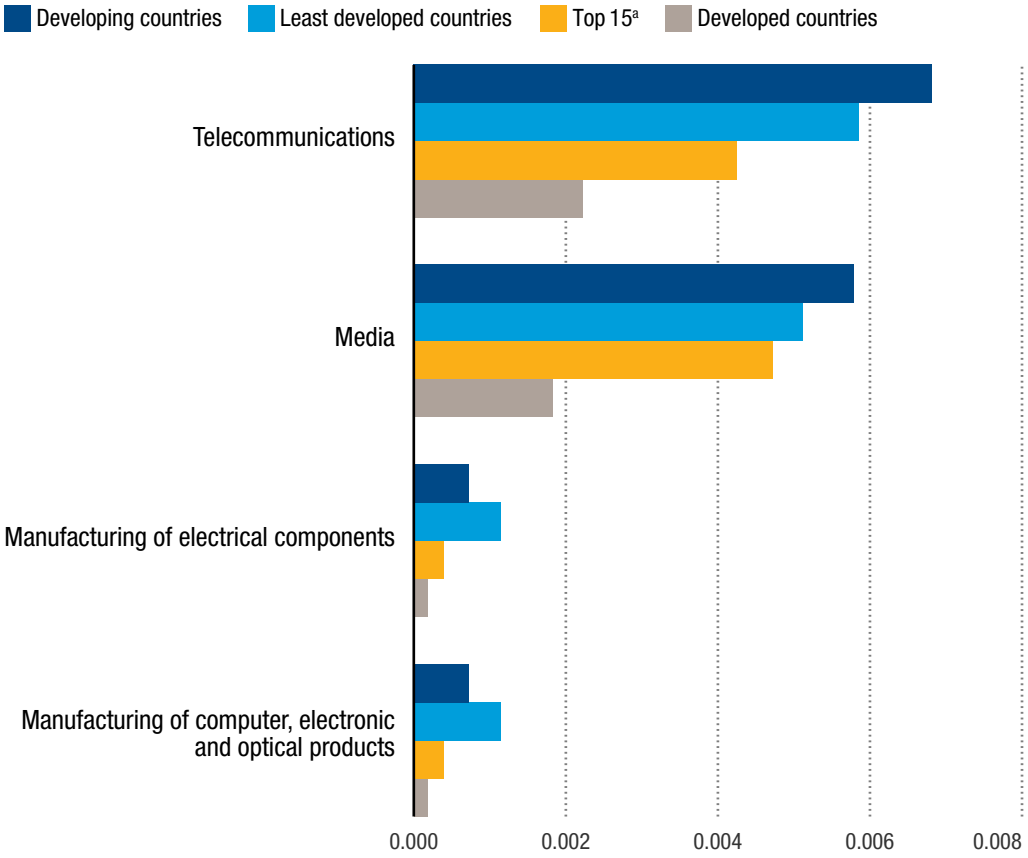
Figure IV.27
Approaches to the entry of foreign investors differ
Entry-related digital policy measures by type and level of development, 2020–2024
(Percentage)



Sources: UNCTAD, Investment Policy Monitor database and the Digital Policy Alert initiative of the St. Gallen Endowment for Prosperity through Trade.

[3] Annual reports on FDI screening by relevant agencies indicate that investment projects in the digital economy represented 60 per cent of all screened projects in Japan in 2020–2023, 45 per cent in Germany in 2020–2024, 44 per cent in the United Kingdom in 2022–2024, 34 per cent in Italy in 2022–2023 and 30 per cent in the United States in 2020–2023.

Figure IV.28
The most restricted digital economy sectors are telecommunications and media
FDI Regulatory Restrictiveness Index in digital sectors, 2023
(Score)



Source: UNCTAD, based on the OECD FDI Regulatory Restrictiveness Index.

Note: Data are available for 104 countries.

[a] Data do not cover Nigeria and Pakistan.

b. Investment facilitation

Facilitation initiatives foster FDI attraction in priority sectors, including the digital economy, by making it easier to establish and operate businesses (UNCTAD, 2024c). For example, the ease of obtaining a license for digital infrastructure is a key factor influencing investor decisions (Stephenson, 2020). Since 2020, several countries have implemented facilitation initiatives targeting the digital economy. These include transparency measures such as guidance documents on screening mechanisms (e.g. India and the Netherlands) and streamlining procedures for start-ups (e.g. Albania and Saudi Arabia) as well as specific sectors such as data centres (e.g. Chile and Malaysia) or semiconductors (e.g. Costa Rica and India). Facilitation services provided by IPAs include customized support for investors, such as visa assistance.

Investment facilitation initiatives also support FDI attraction in the digital economy by leveraging e-government tools to streamline procedures and increase transparency (UNCTAD, 2024c).

Direct facilitation services, such as licensing support and matchmaking with local talent, help investors navigate regulatory and cultural contexts.

Complementary initiatives, including technoparks and regulatory sandboxes, further enhance investment attractiveness. Technoparks foster innovation and attract investment by providing ecosystems for collaboration. Regulatory sandboxes enable enterprises to test new products in a controlled environment, reducing risks and enhancing confidence. Nearly all the top 15 countries have introduced regulatory sandboxes, particularly for fintech and increasingly in sectors such as telecommunications and digital technologies. For instance, Brazil, Colombia, Kenya and Singapore have implemented regulatory sandboxes to promote innovation in AI and other frontier technologies while ensuring responsible development.

c. Investment promotion

By bridging information gaps, promoting comparative advantages, facilitating processes and supporting reinvestment, IPAs are instrumental in attracting FDI in the digital economy. IPAs also promote regulatory improvements and channel investor concerns to line ministries. They should be core players in the government approach to digital transformation, ensuring coherence between national and sectoral strategies and investment promotion efforts. Strengthening their capacity and expertise, especially in emerging technologies, can improve the effectiveness of promotion strategies.

However, as mentioned in section 1, few national digital strategies reflect a role for IPAs. This is confirmed by respondents to the UNCTAD global survey of IPAs conducted for this report, which highlights that only about 20 per cent of developing-country IPAs are involved in the design of digital development strategies. Their role is often limited to advocacy and implementation (more than half of surveyed IPAs). While three quarters of developing-country IPAs in the survey promote investment in core digital infrastructure, half or less promote other digital economy activities. Conversely, a majority in developed countries promote investment in semiconductors and electronic equipment (71 per cent), fintech (64 per cent) or robotics and AI (100 per cent).

In nearly all the top 15 countries, IPAs promote investment in a broad portfolio of digital economy activities, either under general headings such as “ICT and creative industries” or through specific subsectoral approaches, e.g. creative industries in Brazil and Colombia, semiconductors in Costa Rica, electronics in Mexico and Singapore, and data centres and cloud services in Thailand. Their activities include targeting and/or business development (e.g. Armenia, Rwanda, Thailand), image building (e.g. Nigeria, Peru, Türkiye), aftercare (e.g. Armenia, Colombia, Costa Rica), and public-private dialogue and advocacy (e.g. Kenya, Pakistan, South Africa). Other functions include event organization (e.g. Brazil) and presentation of PPP and procurement opportunities (e.g. Nigeria, Peru).

3. Fostering impact

a. Local digital content

Digital content regulations aim to create a safer and more accountable online environment by establishing content moderation frameworks and regulatory authorities and by promoting investment in the localization of content produced by digital economy companies. Since 2020, most measures that regulate digital content have focused on moderating content, including establishing liability for digital platforms, preventing terrorism and cybercrime, regulating digital advertising and enhancing AI transparency.

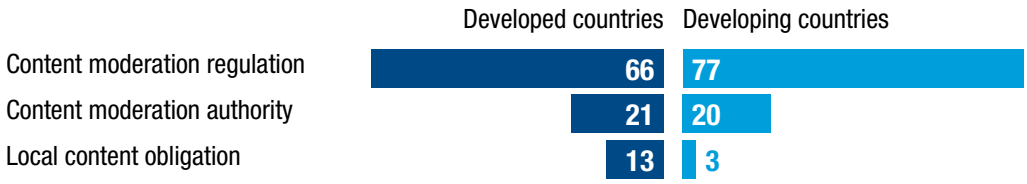
Strengthening oversight through content moderation authorities has also been a policy focus (figure IV.29).

Several developed and some developing countries have introduced local digital content requirements to develop domestic creative industries or ensure that they remain competitive. These include requiring streaming platforms to invest a share of local revenue in national or regional productions (e.g. Italy, the Netherlands and Switzerland), introducing local content quotas (e.g. Ireland, Nigeria and Pakistan) or tying the licensing of broadcasting firms to their local content performance (e.g. Nigeria).

While these measures aim to support local industries by encouraging foreign firms to invest in domestic productions, they can pose challenges if they are too restrictive. Stricter requirements may reduce content availability, increase costs and hinder foreign platforms, affecting competition and innovation. Depending on their formulation, they also risk contradicting international commitments under the WTO agreements.

Developing countries considering such measures should adopt scalable local content requirements tailored to their context, considering their market size, production capacity and international commitments. Larger markets might use quotas and reinvestment obligations (box IV.10), whereas smaller ones could offer incentives such as tax benefits and support for co-production in order to foster linkages. Aligning these requirements with broader digital strategies can enhance their impact. A phased approach with regular stakeholder consultation and impact assessment ensures effectiveness and adaptability.

Figure IV.29
Content moderation is the primary focus of digital content regulations
Digital content regulations by type of moderation, 2020–2024
(Percentage)



Sources: UNCTAD, Investment Policy Monitor and the Digital Policy Alert initiative of the St. Gallen Endowment for Prosperity through Trade.

Box IV.10
Local content requirements and FDI in Nigeria

In Nigeria the media and entertainment sector, known as Nollywood, is the world's second most prolific film industry, producing about 2,500 movies annually and expected to grow by nearly 10 per cent annually through 2028. The National Broadcasting Commission Act and the Nigeria Broadcasting Code mandate that 60 per cent of content for the Nigerian market must be locally produced. The evaluation of licensing extension applications of broadcasters also entails assessment of their local content performance.

MultiChoice, a South African broadcasting company, opened its Nigerian subsidiary in 1993. It has since grown from 30 employees to more than 2,000 and indirectly supports more than 20,000 additional jobs. From 2016 to 2019, the company invested more than $30 million in content and local production facilities alone. In 2022, its streaming service also established local offices in the country, with the objective to further bolster the creation of local content.

Source: UNCTAD, based on World Bank Group (2022), PWC (2024) and company information (https://www.multichoice.com/nigeria.php).

b. Taxation and incentives

The digital economy affects both direct and indirect taxation, requiring a balance between tax collection and a simple, non-discriminatory regime (UNCTAD, 2025). The intangible nature of digital services and the absence of physical presence in a jurisdiction makes the attribution of value creation and oversight of transactions difficult. Without specific rules to govern this type of income, it may also lead to market distortions between digital and non-digital companies and to profit shifting by MNEs.[4] The adoption of taxes specific to the digital economy and the implementation of capacity-building for tax administrations are crucial.

More than 80 per cent of developed countries have taxes specific to the digital economy, compared with 40 per cent of developing countries and less than 25 per cent of LDCs.[5] In addition, the UNCTAD review for this chapter shows that since 2020, nearly two thirds of tax measures for the digital economy in developed countries targeted specific digital activities within the narrow scope definition. In contrast, half of the measures in developing countries targeted core digital economy activities.

Among the top 15 countries, 60 per cent have adopted taxes specific to the digital economy. Examples include provisions to determine whether e-commerce or digital income is sourced locally for corporate income tax purposes (e.g. Rwanda and Singapore) and value added tax registration for non-resident digital providers (e.g. Nigeria). In addition, some have adopted a digital services tax (e.g. Türkiye), while others have introduced a significant economic presence rule (e.g. Colombia, Kenya, Nigeria and Pakistan).[6]

As highlighted in chapter II, incentives to promote investment in the green and digital transformation have proliferated in recent years.

[4] See OECD (n.d.), Cross-border and international tax, https://www.oecd.org/en/topics/cross-border-and-international-tax.html.
[5] Based on data from the ITU ITC Regulatory Tracker 2022, available at ITU | G5 Benchmark.
[6] See International Bureau of Fiscal Documentation, Tax Research Platform. Available at https://research.ibfd.org/#/.

An analysis of global digital policy measures over five years shows that incentives are the main tool to attract investment in the digital economy: 60 per cent of promotional measures in developed countries and 51 per cent in developing countries. This is consistent with the results of the annual UNCTAD global survey of IPAs, which shows that tax incentives are considered the main instrument for attracting investment in the digital economy in developing countries, whereas financial incentives are favoured by developed countries, second only to technoparks and innovation hubs.

Several of the top 15 countries have introduced tax incentives for digital economy investments. They support R&D with deductions and depreciation (e.g. Brazil), tax credits (e.g. Colombia, Mexico, Nigeria) and tax exemptions (e.g. Rwanda, Thailand, Türkiye). Incentives for start-ups are offered by Armenia, Nigeria, Pakistan and Singapore; Thailand supports advanced technology training. Colombia, Mexico and Rwanda also support financing companies, with Rwanda offering targeted incentives for angel investors.

Several developed and developing countries have also adopted financial incentive schemes to promote the development of telecommunications infrastructure in remote areas through universal service funds. However, challenges such as underutilization, inefficiencies and oversight of such funds hinder their potential impact. In this regard, some countries have adopted partnership approaches (see box IV.6) or combined incentives with regulatory measures and development initiatives. In Chile, for instance, direct subsidies are used together with connectivity obligations that are integrated into spectrum allocation processes. They are complemented by a dedicated initiative with the Joint SDG Fund of the United Nations, which focuses on providing rural communities with access to high-quality Internet and digital technologies.

Despite the growing use of investment incentives, the UNCTAD global survey shows that IPAs in developing countries consider the availability of fiscal and financial incentives as the main challenge in attracting FDI in the digital economy, followed by electricity availability and cost. Although incentives remain important for promoting investment, their effectiveness depends on careful design. Incentives that are not well targeted, time-bound or subject to regular impact assessments may result in suboptimal outcomes. Moreover, their relative influence on investor decisions is uncertain, particularly when compared with more fundamental enablers such as the quality of infrastructure, the availability of digital skills, and the maturity and predictability of the regulatory environment.

c. Environment

The digital economy presents multiple environmental challenges. These include resource depletion linked to the material footprint of digital devices and infrastructure; high energy consumption, particularly in computer-intensive processes; and significant water use, including for cooling data centres and electronic manufacturing. Digital devices ultimately become electronic waste, which is a growing global concern (UNCTAD, 2024a).

The environmental impact of international investment in the digital economy depends on host countries' policies and standards. However, many digital strategies, especially in developing countries, overlook this impact. Only about 50 per cent of strategies in developing countries address environmental concerns, compared with 86 per cent in developed countries. These concerns are often broadly framed, without specific metrics.

Even when considering national environmental policy frameworks, regulations specific to digital activities in developing countries remain the exception.

In the case of electronic waste regulations, for instance, while 98 per cent of developed countries have adopted targeted regulations, only 41 per cent of developing countries have done so (33 per cent in the case of LDCs).[7] Among the top 15 countries, few have environmental policies targeting digital sectors and most of these policies operate on a voluntary basis.

Exceptions exist, and several countries that aim to attract investment in data centres are increasingly highlighting energy consumption concerns and setting efficiency targets. For instance, Chile markets its renewable energy as a comparative advantage to attract FDI in data centres but requires the adoption of sustainable practices focusing on water conservation, alternative cooling systems and energy efficiency. In China and Singapore, data centre development plans promote energy-efficient technologies, liquid cooling and renewable energy integration, setting mandatory targets for power usage effectiveness. Denmark and Finland encourage the integration of data centres into district heating systems.

When aligned, investment in the digital and green transitions can reinforce each other, creating synergies for sustainable development. Countries should assess the environmental risks of FDI in digital economy projects, especially in high-impact sectors such as semiconductors and data centres. This assessment includes evaluating energy use, water consumption, emissions and overall environmental footprint. Investment criteria should incorporate sector-specific benchmarks (e.g. power usage effectiveness targets, water limits, emissions thresholds). Countries could also link incentives to the adoption of sustainable practices such as renewable energy use, efficient cooling technologies and circular economy integration.

d. Digital skills and linkages

Digital skills are a key enabler for attracting FDI in the digital economy (Stephenson, 2020). In response, most national digital strategies prioritize the development of digital skills. At the same time, FDI can contribute to local digital capacity through knowledge transfer and linkages with domestic firms. When effectively aligned, digital skills development and FDI attraction can reinforce each other in a virtuous cycle; however, the potential for creating this synergy is often underexploited.

Many countries, including most of the top 15 countries, have adopted schemes to attract foreign digital skills. Digital nomad visas aim to attract remote workers in digital sectors (e.g. in Australia, Bulgaria, China, Costa Rica, Malaysia and Saudi Arabia), while tech visas target skilled professionals and start-up founders (e.g. in Peru, Rwanda, Singapore, Thailand and Türkiye). Some countries offer one-stop shop services (Thailand) or assign visa authority to IPAs (Singapore).

Other initiatives include partnerships with foreign education institutions to establish local branches (e.g. Rwanda), promoting traineeship programmes with private companies (e.g. Armenia, Nigeria) and developing AI training with FDI support (e.g. Costa Rica). Many countries have established diaspora programmes aimed at attracting or leveraging the tech skills of citizens living abroad. For instance, the Start-Up Armenia Foundation connects diaspora Armenians with local entrepreneurs for investment, mentorship and networking opportunities. Rwanda and the International Organization for Migration have partnered to address technical and vocational education and training needs through the engagement of highly skilled diaspora professionals residing in Europe. Nigeria organizes annual Diaspora Investment Summits to promote “brain gain” by connecting diaspora tech professionals with local start-ups, universities and investors.

[7] Based on data from the ITU ITC Regulatory Tracker 2022, available at ITU | G5 Benchmark.

Developing countries take various approaches to linkages support. Some facilitate direct engagement among enterprises through one-stop, online, business-to-business marketplaces and databases (e.g. Kenya, Nigeria, Singapore) (box IV.11). Others adopt case-by-case matchmaking through IPAs (e.g. Costa Rica, South Africa, Türkiye) or leverage technology development zones and SEZs (e.g. China, India, Malaysia, the United Arab Emirates). Several bilateral partnerships promote business linkages in digital sectors (e.g. Nigeria–Japan, Singapore–France and the United States, China–Pakistan). The UNCTAD Business Linkages Programme assists countries in these efforts.

Box IV.11
Driving international cooperation and investment in the digital economy through business linkages – the example of Singapore

Launched in 2017, the Global Innovation Alliance (GIA) is a joint initiative between the Ministry of Education of Singapore, the Singapore Economic Development Board (the country's IPA) and Enterprise Singapore, the government agency for enterprise development. Its goal is to connect Singapore-based start-ups and SMEs with global innovation ecosystems. Under the GIA, Enterprise Singapore supports three initiatives aimed at fostering business linkages with foreign partners, all focused on technology and innovation:

1) Acceleration programmes. Spanning more than 20 cities worldwide, they are designed to accelerate market entry of companies through workshops, mentorships and networking with potential clients and partners. They help Singapore-based companies to expand overseas and international start-ups to establish a presence in the country.

2) Co-innovation programmes. These programmes encourage collaboration between Singapore-based companies and overseas partners across 40 countries, including Australia, China, France, Germany, India, Israel, Japan and the Republic of Korea. The collaborations focus on R&D projects resulting in new products or solutions with strong market potential. Companies can register on a business-to-business platform to find project partners and participate in joint innovation calls. Funding support can be provided by Enterprise Singapore and the counterpart institution in the partner country.

3) GIA+ Initiative. The initiative supports Singapore-based start-ups in joining global accelerator programmes. Start-ups gain access to in-market experts, mentorship, resources and extensive networks to scale internationally. Enterprise Singapore provides financial support to eligible start-ups to help cover the costs of participation in these programmes.

Source: UNCTAD, based on Government of Singapore sources (https://www.openinnovationnetwork.gov.sg/ and https://www.enterprisesg.gov.sg/grow-your-business/innovate-with-us/market-access-and-networks/global-innovation-alliance/overview).

4. Harnessing international agreements

The international legal regime regulating cross-border investment in the digital economy is increasingly complex, presenting both opportunities and challenges. The analysis of existing IIAs shows that treaties can (i) seek to increase flows of investment related to the digital economy, (ii) directly regulate digital economic activity and (iii) be used in Investor–State dispute settlement (ISDS) relating to the digital economy, including digital services and infrastructure investment.

a. The role of IIAs in enhancing investment flows for the digital economy

Old-generation IIAs generally lack provisions directly related to digital investment but also contain an open-ended definition of investment, covering physical assets, such as information and communication technology infrastructure, and non-physical assets, including IP rights. Digital economy investment that relies on some form of physical presence in the territory of the host State, such as a local company or branch, tends to be covered whereas stand-alone digital goods and services, such as apps and websites, may not fall under the treaty definition of investment.

New-generation IIAs more comprehensively address the digital economy with provisions on investment facilitation, promotion, cooperation and liberalization. These treaties could enhance investment in the digital economy to bridge the digital divide, including investment in fundamental infrastructure.

i. Facilitating investment in the digital economy

Modern IIAs aim to enhance investment flows, including in the digital economy, by embracing investment facilitation features. These features tackle ground-level obstacles to investment, for example, by ensuring transparency, streamlining processes and creating stakeholder engagement mechanisms (UNCTAD, 2023c). Increasingly, IIAs incorporate digital investment facilitation tools aligning with the needs of the digital economy, for example, by allowing remote inquiries and permit requests. Between 2021 and 2023, 60 per cent of IIAs included digital facilitation, up from 36 per cent in 2015–2016 (UNCTAD, 2024c). At the multilateral level, the WTO Investment Facilitation for Development Agreement requires parties to make available, by electronic means, information of importance to investors and encourages the acceptance of electronic submissions for investment authorization, where required. Generally, these measures apply to all investors and investments.

Some IIAs specifically include facilitation measures relating to the digital economy. By the end of 2024, more than 100 treaties encouraged the publication of laws relating to e-commerce and digital trade. Similarly, some treaties encourage engagement between government and digital economy stakeholders. Other treaty provisions are specific to particular sectors or economic activities. The African Continental Free Trade Agreement (AfCFTA) Protocol on Digital Trade, for example, obliges its parties to facilitate investment in ICT sectors. In regard to specific digital services, treaty provisions on e-payment services frequently require the timely processing of licenses and the publication of relevant laws and regulations.

ii. Promoting investment in the digital economy

Investment promotion is often tailored to specific sectors or projects. New-generation IIAs frequently include provisions for priority sectors, which may include ICT. There is no standard approach for promoting investment in the digital economy, thus leading to diverse practices. For instance, the AfCFTA Protocol on Digital Trade broadly refers to promoting investment in digital infrastructure and specifically calls for promoting investment in ICT.

Similarly, the Trade and Economic Partnership between the European Free Trade Association and India contains references to increased investment flows and technology collaboration, including cooperation between centres of excellence, dialogue and exchange of information between the parties as well as sharing of best practices.

Technological cooperation chapters in new-generation IIAs often mention digital technology and joint promotion activities (box IV.12). Such general clauses on cooperation and promotion for digital economy investment reflect the parties' intentions and can be detailed in memorandums of understanding. For example, the Australia–United Arab Emirates Comprehensive Economic Partnership Agreement includes a memorandum on "investment cooperation in data centres and AI projects", outlining areas of cooperation to explore digital economy investment opportunities.

Box IV.12
Transfer of digital technology and international investment treaties

Technology transfer involves the cross-border movement of systematic knowledge and technology for producing goods, applying processes or delivering services. Bridging the digital divide inherently involves such transfer to developing countries, particularly LDCs.

Investment approval can be accompanied by the imposition of performance requirements – conditions imposed on investors, such as using domestic goods or transferring technology. A number of IIAs explicitly ban such requirements. In total, at least 333 treaties limit host States in imposing performance requirements.

Some IIAs also restrict digital-specific performance requirements. For instance, 27 agreements ban forced transfer of source code and algorithms, and 37 restrict data localization (TAPED data set, 2024). However, they typically include exceptions, recognizing such measures may serve public goals such as protecting digital infrastructure, data, consumer rights or competition.

New-generation IIAs increasingly promote technology transfer on mutually agreed terms,[a] through clauses on investment cooperation, promotion and obligations to, for example, train local staff or enable knowledge transfer through the temporary movement of personnel.

IIAs can better facilitate digital know-how and technology diffusion by explicitly encouraging transfers on mutually agreed terms – through training, licensing or joint ventures – especially for developing countries. Moreover, prohibitions on performance requirements could be balanced with safeguards to preserve domestic policy space and support long-term development and digital inclusion. Technology transfer is also closely linked to the protection of intellectual property (IP) rights. The TRIPS Agreement and many IIAs set international rules in this area. IP protections that go beyond internationally accepted standards may run counter to the objective of improving technology transfer in developing economies (UNCTAD, 2014). Instead, the use of explicit and implicit flexibilities within existing international IP rules can allow economies to adapt international IP protection rules to their level of development (UNCTAD, 2014; Commonwealth Secretariat and UNCTAD, 2024), allowing for gradual upgrading as economic development and local innovative capacity progress.

Source: UNCTAD.

[a] See, for example, the European Union–Kenya Economic Partnership Agreement (2023) and the India–United Arab Emirates Comprehensive Economic Partnership Agreement (2022).

iii. Development cooperation for the digital economy

Some IIAs include cooperation provisions that may support the integration of developing countries into global digital value chains. They provide, for example, for information exchange, technology transfer, technical assistance and capacity-building – covering skills development, digital literacy and ICT infrastructure. Some IIAs identify ICT as a priority, committing parties to cooperate. The European Union–Kenya Economic Partnership Agreement, for example, aims to enhance connectivity, frameworks, development, capacity-building and ICT-enabled services such as e-commerce, e-government and transactions. The AfCFTA Digital Trade Protocol and the Regional Comprehensive Economic Partnership similarly address the concerns of developing economies, including technical assistance, digital skills development and investment in the digital economy.

Cooperation provisions can bridge the digital divide, enabling adaptation to the digital economy for SMEs and local workers. Knowledge-sharing and training translate digital economy FDI into development. Facilitation and promotion clauses in IIAs can help attract digital economy investment, including in e-commerce, ICT infrastructure and digital services. In this way, investment facilitation, promotion and cooperation in IIAs can reduce barriers and create a predictable ecosystem for digital investment.

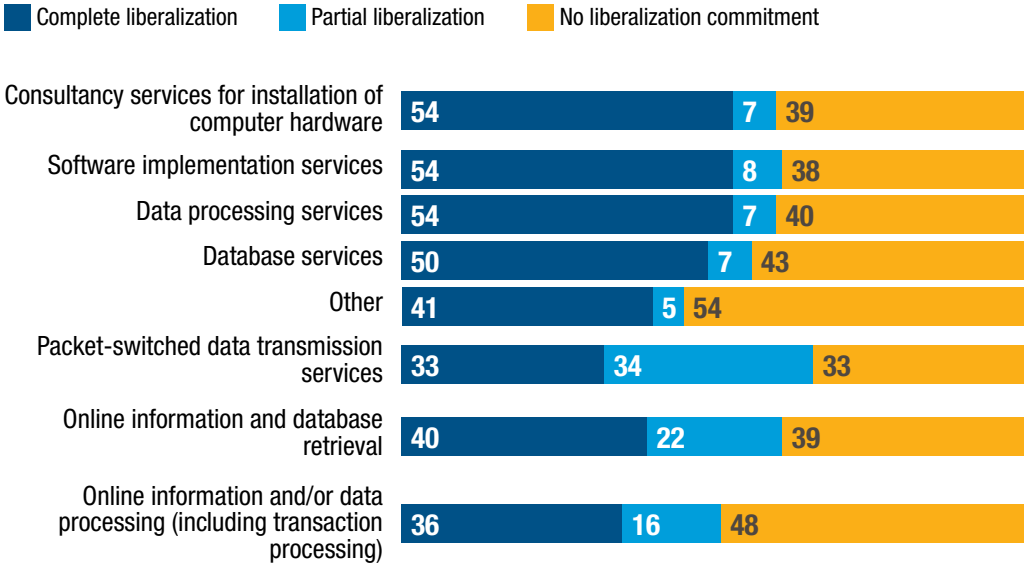
iv. Liberalization commitments relating to the digital economy

IIAs include commitments to open specific economic sectors, beyond post-establishment protections. The WTO's General Agreement on Trade in Services (GATS), particularly Mode 3 (commercial presence), governs services-related FDI, covering a significant share of digital economy investment. Some IIAs have binding liberalization commitments in key digital sectors such as telecommunications, data processing, software services and cloud computing. As services digitalize, previously analogue services such as advertising and payments are also covered. Key sectors already liberalized under WTO rules include computer services and telecommunications. Figure IV.30 shows high liberalization levels for investment in select digital services. Typical restrictions such as local incorporation requirements, licensing obligations and foreign equity limits remain.

Many countries pursue additional liberalization of digital economy sectors through bilateral and regional agreements, often using a negative list approach – sectors are opened up unless specifically excluded – which differs from the WTO GATS. Under the Comprehensive and Progressive Agreement for Trans-Pacific Partnership, digital sectors such as telecommunications and computer services are largely liberalized, with few reservations listed, resulting in substantial market openness beyond GATS commitments. The Regional Comprehensive Economic Partnership allows members to choose between positive and negative listing. It generally mirrors the WTO trend of high liberalization for computer-related services and relatively more restrictions in telecommunications, including foreign equity limits, joint venture requirements and local incorporation obligations. In the Comprehensive Economic and Trade Agreement between Canada and the European Union, there are no major restrictions on investment in computer services, though Canada maintains limits on foreign ownership and control of facilities-based telecommunications services. Other regional agreements show similar trends, with broad liberalization for digital services sectors such as telecommunications infrastructure, cloud computing and data processing. While liberalization offers opportunities, a cautious and phased approach helps countries align commitments with their regulatory capacity and development goals, ensuring policy space to manage emerging technologies and digital sector risks.

Figure IV.30
A significant share of WTO Members liberalize market access for investment in select digital services

Liberalization commitments of WTO Members for market access under mode 3, services supply in the digital economy
(Percentage)



Source: UNCTAD.

Note: Mode 3 refers to commercial presence.

Abbreviation: WTO, World Trade Organization.

b. IIAs regulating new and emerging digital economy issues

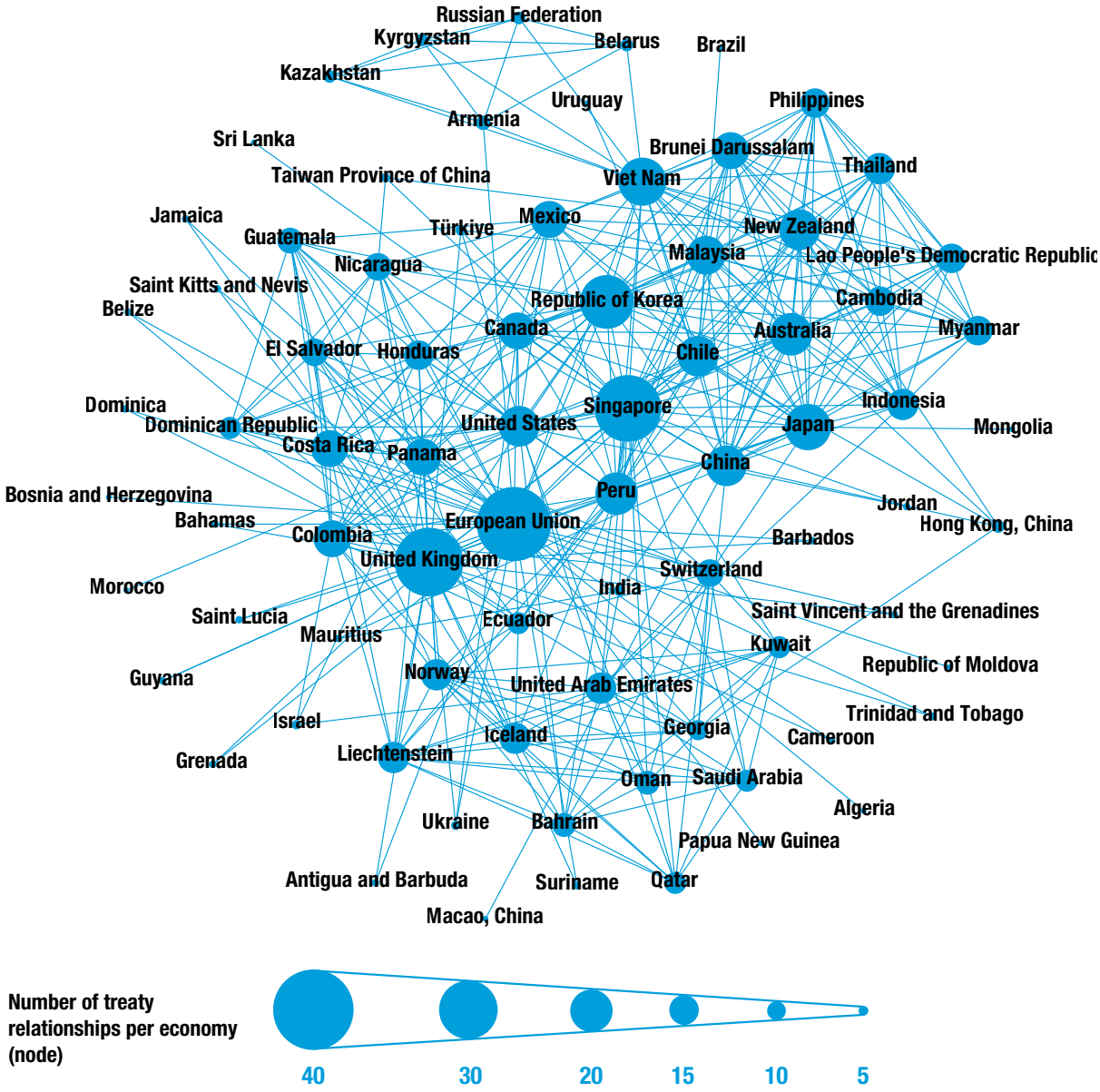
IIA rules relating to the digital economy emerged around the millennium and increased significantly in the last decade. Currently, only 231 international agreements (191 in force) contain provisions on the digital economy. Most of these agreements are broader treaties with investment provisions. However, the rules are rarely found in dedicated investment chapters but instead form part of chapters on electronic commerce, digital trade, services and IP. A small number of bilateral investment treaties explicitly touch on digital economy investment. Since 2019, a few stand-alone digital economy agreements have existed, which often do not directly address investment but are included in the analysis for completeness.

i. International commitments regulating new issues relevant to the digital economy on the rise

Treaty rules on the digital economy govern how goods and services are produced, marketed and distributed electronically. They address issues such as non-discrimination, paperless commerce (e-invoices, e-signatures, e-payments), data flows, data protection, cybersecurity, source code, digital skills, inclusion (especially for SMEs) and consumer protection. These treaties provide a stable framework, overcoming coordination challenges (e.g. prohibiting customs duties on electronic transmissions) and facilitating cooperation, particularly in cybersecurity and data protection. A well-connected cluster of countries at the centre of figure IV.31 lead the adoption of digital economy treaties.

Figure IV.31
Advanced economies dominate the growing network of international treaties with provisions relating to the digital economy

In-force agreements with substantive provisions regulating the digital economy signed 2000–2024 (*n* = 138)



Sources: UNCTAD, based on the TAPED (Trade Agreement Provisions on Electronic Commerce and Data) data set of the University of Lucerne; data visualization through Gephi (https://gephi.org).

Note: The network excludes treaties that contain limited prescriptions such as reiterating rules on intellectual property protection found elsewhere, recognizing the importance to facilitate and promote digital trade, or establishing a commitment to cooperate on information and communication technology.

The network in figure IV.31 focuses on a subset of the 231 treaties, covering only 138 in-force agreements that contain substantive provisions regulating the digital economy and excluding treaties that are not in force or merely contain limited prescriptions on IP or commitments to cooperate. The network covers 106 economies, many of which are advanced economies. Few LDCs are part of the in-force legal framework. For many African countries, the AfCFTA Protocol on Digital Trade – yet to enter into force – represents their first engagement in global digital rulemaking.[8] Treaty-making is still dominated by developed economies. This imbalance may mean that critical issues for LDCs are underrepresented. Inclusive negotiations, capacity-building and technical support are key to ensuring more equitable and inclusive digital rule making.

ii. Zooming in on new areas of investment governance: data, fintech, e-payments and AI

The free flow of data can be important for digital economy investment. Treaties increasingly include binding provisions on data flows and prohibit data localization. Early non-binding approaches have given way to stronger commitments over the past decade (figure IV.32). In addition, free flow of data provisions also appear in financial and telecommunications services chapters.

For financial services, treaties typically require States to allow data transfer and processing abroad. In regard to telecommunications services, provisions often reflect the WTO GATS Annex on Telecommunications, mandating access to public networks for moving information across borders.

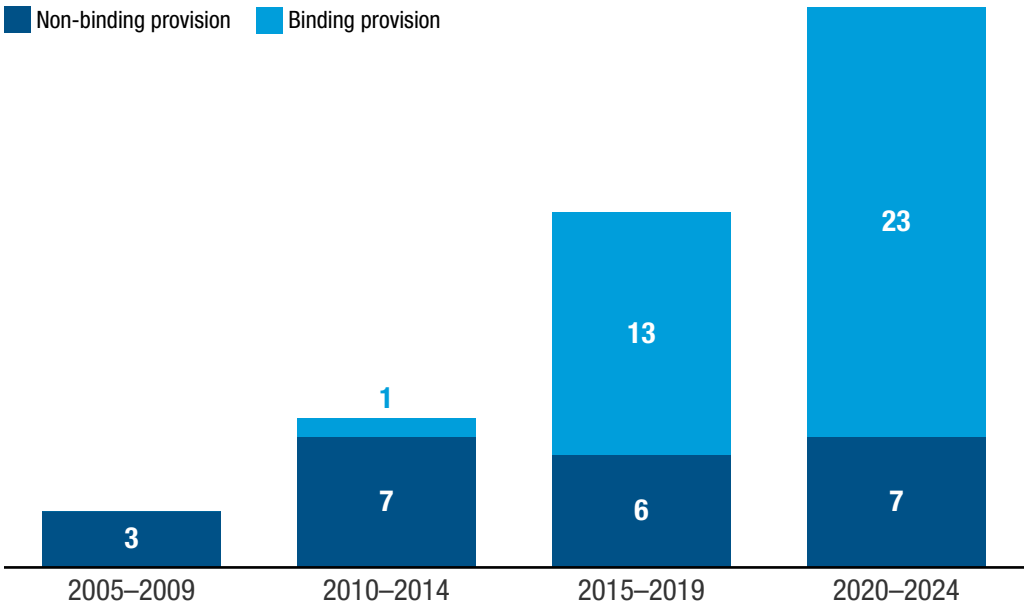
Treaties simultaneously increasingly recognize governments' right to restrict data flows or require local storage for reasons such as privacy, data protection or national security. Although no uniform model exists, treaties at times extend coverage of General Agreement on Tariffs and Trade Article XX and GATS Article XIV-style exceptions to provisions on the free flow of data or refer to "legitimate policy objectives", with safeguards against arbitrary measures.[9]

Other new areas of regulation include fintech, e-payments, AI and competition policy for the digital economy (box IV.13). Many of these clauses are currently non-binding, focusing on cooperation for the development of standards and knowledge-sharing. On e-payments in particular, the few treaties that address the topic aim to promote secure and efficient cross-border transactions and highlight interoperability. Agreements involving developing parties, such as the WTO Joint Statement initiative on E-Commerce and the AfCFTA Digital Trade Protocol, additionally emphasize the affordability and inclusiveness of services.

[8] See for example, IISD Policy Analysis available at https://www.iisd.org/articles/policy-analysis/afcfta-digital-protocol. In addition, negotiations for the WTO Joint Statement Initiative on E-commerce include 41 developing countries and 5 LDCs. Agreement on a stabilized text was reached in July 2024.

[9] For the former approach see, for example, Indonesia–United Arab Emirates Comprehensive Economic Partnership Agreement (2022), Article 17.4(2). For the latter approach see, for example, the 2024 Protocol Amending the European Union–Japan EPA (2018), Article 3(3) and (4).

Figure IV.32
Provisions on the free flow of data are gaining importance
Frequency of provisions mandating the free flow of data
(Number)



Source: UNCTAD, based on the TAPED data set.

Note: Based on the analysis of treaties concluded between 2000 and 2024.

Box IV.13
Competition provisions in IIAs relevant to the digital economy

Competition rules are crucial to the digital economy, as they prevent dominant players from blocking new entrants or stifling innovation. A growing number of IIAs contain dedicated chapters on competition, which require effective competition laws, procedural requirements and cooperation for enforcement action. Some treaties also provide for technical assistance and capacity-building in this area. Telecommunications chapters add dedicated disciplines on network access use, interconnectivity, universal services obligations and the prevention of anticompetitive practices. A small number of agreements explicitly encourage the parties to cooperate in the development and application of competition laws relating to the digital economy.

Source: UNCTAD.

iii. Responsible digital investment

Treaties addressing the digital economy often include provisions that promote responsible digital investment. These provisions cover consumer and data protection, measures against fraud, deceptive practices and curbing spam (figure IV.33). Such provisions can go a long way towards complementing national policies in building trust in the activities of digital investors. Typically, these provisions encourage or require States to adopt regulatory measures, rather than imposing direct obligations on private entities.

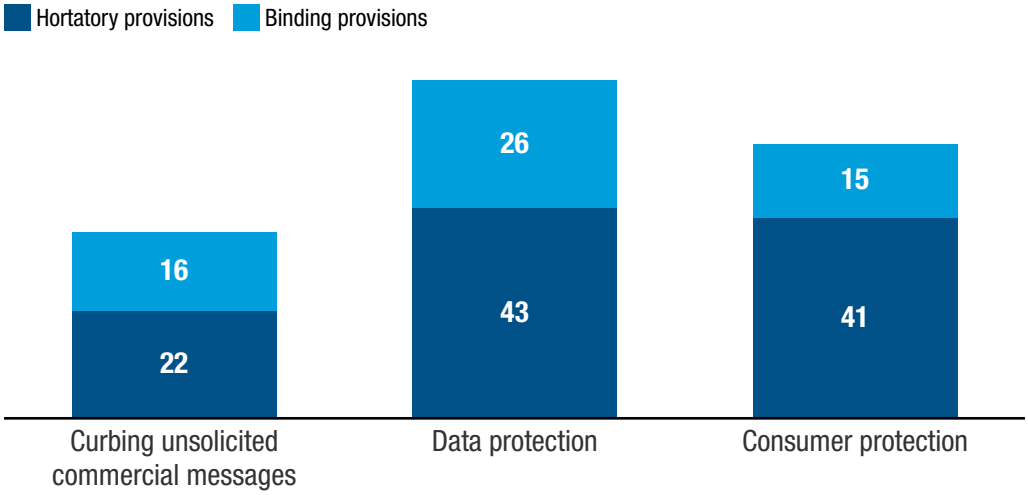
Bolstering responsible investment practices in IIAs, such as discouraging deceptive practices and safeguarding consumer data, ensures responsible business conduct in the digital economy. This builds trust and reduces reputational and regulatory risks for both investors and host States, aiding in further attracting investment.

iv. Development-oriented provisions relating to the digital economy remain underused

Development-focused provisions remain mostly non-binding and scarce. Figure IV.34 contrasts the most frequently used trade and investment-related provisions in treaties that regulate the digital economy with the scarce inclusion of development-focused issues. The limited participation of developing countries, particularly LDCs, in treaty-making appears to drive this trend.

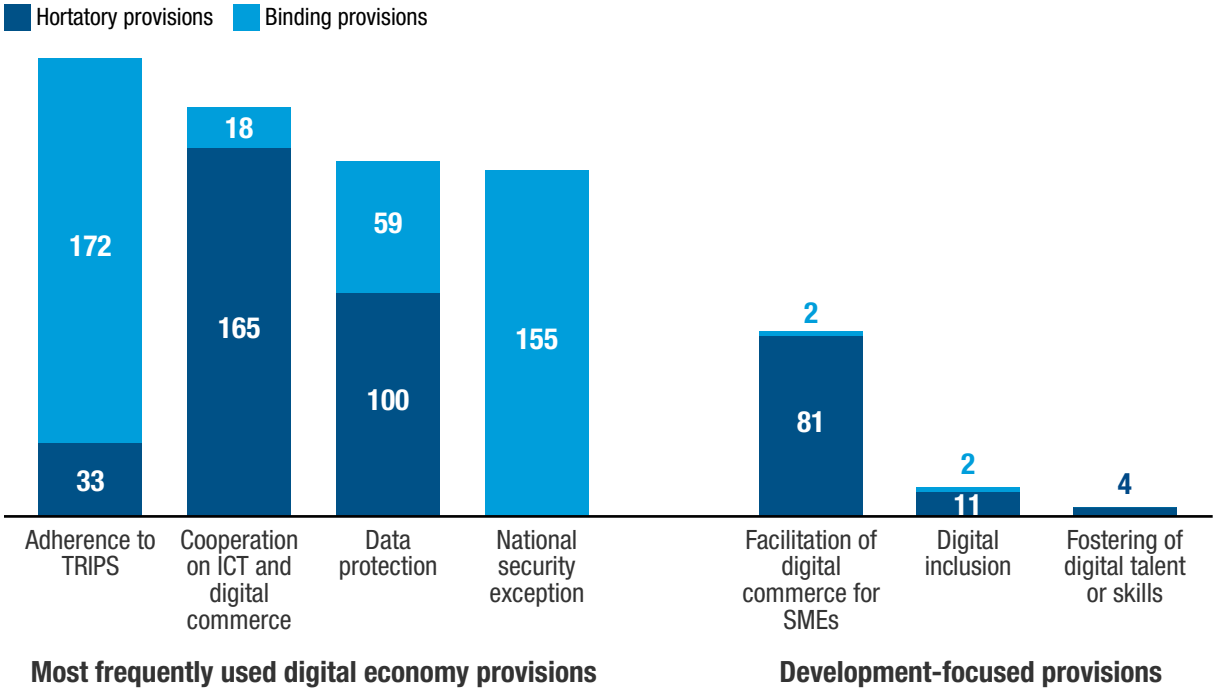
The AfCFTA Digital Trade Protocol, which aims to promote and facilitate investment in the ICT sector in accordance with the Protocol on Investment, is exemplary in its adoption of development-oriented provisions for the digital economy. It includes actions to promote digital inclusion, such as improving digital literacy and supporting marginalized groups.

Figure IV.33
Treaty provisions creating trust in the digital economy
Share of treaties with provisions regulating the digital economy (*n* = 231)
(Percentage)



Sources: UNCTAD, based on the TAPED data set.

Figure IV.34
Development-focused provisions are scarce in treaties regulating the digital economy
Frequency distribution of treaty coverage of select policy areas related to the digital economy
(Number of treaties; *n* = 231)



Source: UNCTAD, based on the TAPED data set.

Abbreviations: ICT, information and communication technology; SMEs, small and medium-size enterprises; TRIPS, Agreement on Trade-Related Aspects of Intellectual Property Rights.

The Protocol also addresses SME support, encourages digital innovation and entrepreneurship, and requires digital skills development. In addition, it acknowledges the need for technical assistance to drive implementation.

Development-oriented commitments on issues such as digital skills training, capacity-building and digital infrastructure expansion remain underused in IIAs but are crucial for inclusive growth. Targeted clauses can guide investment in local capacities, infrastructure, technology spillovers and digital inclusion.

c. Investment dispute settlement and the digital economy

ISDS provisions in IIAs highlight the need to preserve policy space to regulate in the public interest and ensure responsible investment conduct, especially relating to, for example, digital infrastructure, telecommunications services and data. At least 71 ISDS cases have involved telecommunications, with disputes increasingly linked to intangible assets, data and IP rights.

Telecommunications-related cases, mostly involving the provision of internet and mobile network services, often revolve around issues relating to concessions or regulatory changes. For example, in *Neustar v. Colombia*, the dispute concerned a government decision not to renew a domain name concession. Other cases, such as *Telenor v. Hungary* and *Telefonica v. Mexico*, challenged regulatory actions affecting mobile services.[10]

Newer ISDS cases in the digital economy reflect the rising prominence of intangible assets and digital services, relating, for example, to mobile payment systems for transportation, online financial services and digital advertising. *Nexo v. Bulgaria*, for example, concerns lost business opportunities due to crypto-related investigations. These cases expose tensions between, on the one hand, a State's right to regulate emerging tech and, on the other hand, investor protections. Clearer IIA provisions – such as refined standards, well-defined exceptions and carveouts – can help maintain regulatory flexibility, reduce ISDS risks and support sustainable digital investment.

[10] UNCTAD, Investment Dispute Settlement Navigator, available at https://investmentpolicy.unctad.org/investment-dispute-settlement.

D. Policy recommendations and the way forward

The digital economy is transforming global investment, creating opportunities for innovation and growth, but widening the digital divide. Despite increased investment in digital infrastructure, significant disparities persist in access, usage, capacity and regulation, particularly between developed and developing economies, including LDCs. International investors are key to this transformation. While regional players are rising in Africa, Asia and Latin America, a few MNEs dominate global FDI, concentrating investment in select areas and limiting broader developmental impact. Investment in the digital economy is shifting from platforms to services and physical infrastructure such as data centres, fostering long-term development, local content and technology transfer.

Closing gaps in digital infrastructure is vital, especially for LDCs, which face challenges that hinder their participation in the global digital economy. Targeted investment, particularly through PPPs and innovative financing, is essential. IIAs increasingly promote, facilitate and regulate investment in the digital economy. However, they often overlook sustainable development and digital divide challenges and can expose countries to ISDS, requiring careful management for predictable outcomes.

Several challenges hinder international investment in the digital economy, limiting digital development and technology-enabled growth in developing countries while preserving investment concentration in developed countries. These challenges can be grouped into five main categories:

- Lack of a unified, country-specific strategic approach that integrates digital strategies with national development and investment promotion, leading to low investment performance and effectiveness.
- Weak governance and regulatory frameworks that create uncertainty, deterring long-term investment in digital infrastructure and services; insufficient legal protections and a poor investment environment that hinder digital development.
- Limited digital infrastructure, such as broadband networks and data centres, that restricts connectivity and transformation.
- Insufficient energy production, unreliable electricity, water scarcity and lack of critical minerals that limit digital infrastructure and investment.
- Shortages of skilled professionals and digital literacy that impede technological adoption, innovation and digital progress.

Given the overarching importance of strategy and policy in altering context-specific conditions and attracting more international investment while also fostering local business development, this chapter provides the following series of governance-related

recommendations for the consideration of policymakers, partners and stakeholders.

Adopt a long-term vision for investment in the digital economy. National digital strategies in many developing countries lack specific objectives or targets related to investment, including FDI, and to the types of investors and sectors most relevant to advancing digital transformation. This reflects limited alignment with industrial policies and investment promotion plans. Digital strategies should articulate a coherent long-term vision that fully incorporates the role of international investment, including by

- Defining priority sectors for attracting investment in the digital economy that support countries' progression along the digital value chain and contribute to broader strategic industrial development goals.
- Guiding complementary policy efforts in skills development, regulatory reform and infrastructure planning.
- Providing key elements to inform investment planning, such as identification of infrastructure gaps, digital infrastructure demand projections, assessment of connectivity potential, mapping of strategic locations (e.g. for data centres and innovation hubs) and planned regulatory initiatives.
- Integrating environmental and sustainability considerations by embedding sector-specific benchmarks and criteria that address the environmental footprint of investment in the digital economy.
- Informing targeted investment promotion efforts by specifying the type of investments and investors that can advance structural transformation and digital upgrading.
- Aligning with regional digital strategies to leverage economies of scale, facilitate cross-border digital integration and promote consistency in regulatory and investment frameworks across countries.
- Ensuring coordinated implementation, clearly delineating the role of IPAs and establishing mechanisms for their effective coordination with institutions responsible for digital economy development.

Balance openness to FDI with national security and public interest. Many countries with pressing infrastructure needs continue to impose foreign equity restrictions in the telecommunications sector. To attract FDI, it is necessary to review such restrictions against strategic objectives – while maintaining robust safeguards to protect national security and public interest. These safeguards should specifically address control of critical infrastructure, access to sensitive data and management of strategic technologies. Any restrictions introduced should be clearly defined, transparent and proportionate to the identified risks.

Strengthen regulatory frameworks for international investment in the digital economy. Clear, predictable and adaptable regulations for data protection, cross-border data flows, cybersecurity, competition, taxation and IP are essential to attract investment in the digital economy. To support effective policy design and implementation, development partners can provide valuable assistance to governments in aligning regulatory approaches with investment priorities and national development objectives.

Enhance the role of IPAs and adopt more targeted and impact-driven promotion. IPAs should be at the heart of digital transformation by actively contributing to the design and implementation of digital strategies. Their functions should extend beyond traditional promotion to encompass proactive advocacy for regulatory reforms, strategic alignment of investment promotion targets and monitoring of reforms. Promotion and facilitation activities should focus on the type of investment and investors that align with the country's digital development goals and can advance its positioning on the digital value chain.

Develop digital skills, including through FDI. Governments can foster the attraction and development of skills in the digital economy through talent mobility, skills transfer and linkages programmes. Diaspora engagement schemes and partnerships with foreign universities and training institutions can also connect global expertise with local needs. By introducing scalable and phased local content initiatives aligned with national digital strategies and international commitments, governments can also encourage FDI that supports locally relevant digital content and services.

Strengthen IIAs' impact on sustainable investment, including for the digital economy. IIAs should be modernized to reflect the evolving nature of international investment, which increasingly involves asset-light models, services, intangibles and digital assets, where value creation is often driven by factors such as data, platforms and customer bases. This shift requires updated definitions and provisions, particularly in relation to investor protections and dispute resolution. At the same time, IIAs should be made more supportive of sustainable development by promoting and facilitating investment in sectors that are critical to achieving the Sustainable Development Goals – including the digital economy – while ensuring policy space for governments through carefully designed safeguards that account for the unique characteristics of these sectors.

Encourage technology transfer on mutually agreed terms in IIAs. IIAs could include provisions that promote transfer of the technology needed for a number of key policy objectives, including combating climate change and achieving digital transformation. These provisions can be complemented with adequate exceptions in clauses that prohibit performance requirements. The protection of IP rights and technology transfer are closely linked. The TRIPS Agreement and many IIAs set international rules in this area. The use of explicit and implicit flexibilities within international IP commitments can allow economies to adapt international IP protection rules to their level of development.

Strengthen the development-oriented provisions relating to the digital economy in IIAs. Targeted IIA clauses on digital skills training, inclusion, SME support and digital infrastructure development can complement broader enabling frameworks to support investment towards building local capacities and bridging the digital divide.

Facilitate participation by developing countries in international rule making. Developing economies, particularly LDCs, are underrepresented among the parties to agreements that regulate the digital economy. They should receive support in international investment rule making through capacity-building, technical assistance and inclusive negotiation platforms, aligning provisions on digital investment with their needs. In this regard, regional IIAs, with their potential for enhanced cooperation between the parties, have great promise for strengthening development-oriented provisions relating to investment in the digital economy.

To attract FDI in the digital economy, accelerate digital transformation and promote sustainable development, developing countries need to strengthen digital infrastructure, improve connectivity, enhance digital skills and establish a sound policy framework. To shape the foundations of the policy framework, countries should set up data and AI governance, formulate digital development strategies, strengthen IP protection, and improve the business and investment climate for digital industries.

Both FDI policy and related policies need to be improved. To attract more valuable FDI projects, developing countries need to strengthen investment promotion and facilitation for specific digital industries and undertake targeted policy measures to facilitate foreign investment. To better benefit from FDI in the digital economy, countries also need to improve their competition policy, industrial policy, science and technology policy, and SME policy. By doing so, they can enhance the indirect effects of FDI in the digital economy through, for instance, demonstration and spillover effects, thus promoting the development of domestic enterprises and digital ecosystems.

Home and host countries alike need to pay attention to the environmental, social and governance dimensions of the digital economy. Many of the issues, such as energy consumption by data centres, the use of critical minerals and the generation of electronic waste, do not relate directly to international investment, but they need to be taken into account in assessing the impact of FDI in digital economy projects on sustainable development. At the firm and project levels, foreign investors should strengthen their compliance with their environmental, social and governance responsibilities. The joint efforts of governments, enterprises and civil society will make international investment in the digital economy better promote sustainable development.

To support countries at risk of being left behind, UNCTAD proposes a multi-stakeholder action agenda to catalyse international investment in the digital economy. This agenda includes seven key priority areas:

- **Establishing a global framework for measuring and reporting investment in the digital economy.** Reliable data on FDI in digital economy is essential for sound policymaking. A standardized global framework will enable countries to capture, track and report investment flows in the digital economy in an internationally comparable manner. This will support better policy diagnostics, benchmarking and coordination across borders.
- **Developing a policy toolkit for investment in the digital economy in developing countries.** The toolkit will guide policymakers in designing tailored investment policies and strategies for digital industries. It will include policy and regulatory options, as well as diagnostic tools focused on matters such as data localization, IP, tax policy, platform regulation and PPPs, with a strong emphasis on aligning investment policy with the Sustainable Development Goals.
- **Exploring leapfrog opportunities for developing economies, particularly for LDCs.** As part of a forward-looking investment strategy for the digital economy, it is essential to identify and harness leapfrog opportunities for developing economies in the early stage of digitalization. Targeted investment in scalable solutions – such as mobile telecommunications and mobile-based services – can unlock transformative change when paired with enabling policies, capacity development and international cooperation.
- **Launching a global partnership for sustainable investment in the digital infrastructure.** Bridging the digital infrastructure gap – particularly in underserved and remote areas – requires new models of blended finance and international cooperation. This initiative will convene governments, multilateral development banks, development finance institutions, institutional investors and technology providers to mobilize resources for investment in digital technologies suitable for developing countries at different stages along the development and digitalization ladders.
- **Advancing multilateral dialogue on governance for investment in the digital economy.** In the fragmented legal and regulatory context, multilateral dialogue is needed to shape coherent and development-oriented rules on investment in the digital economy. This includes exploring investor obligations, dispute settlement mechanisms suited to digital industries, responsible data governance, and the balance between openness and national regulatory and policy spaces. UNCTAD will support the intergovernmental dialogue and consensus-building process.

- **Enhancing digital skills and innovation ecosystems in developing countries.** Developing countries need to strengthen their capacity to absorb and benefit from investment in the digital economy through education, training and support for domestic entrepreneurship and digital innovation. UNCTAD will work with partners to promote technical training and university–industry collaboration, as well as to foster regional innovation hubs and digital incubators.
- **Promoting responsible investment in the digital economy and mitigating risks.** UNCTAD aims to develop practical guidance for responsible investment, support sustainability standards and equip regulators with tools to address emerging risks while promoting inclusiveness in digital markets.

Collectively, these priorities chart a strategic investment road map for the international community to advance digital transformation, turn the digital divide into a digital dividend, and build a smart, inclusive and sustainable future for all.

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Annex table A.1
Top 100 digital enterprises by sales, 2025

Rank	Company name	Country of headquarters	Industry classification	Sales (Billions of dollars)		Assets (Billions of dollars)	
				Total	Foreign	Total	Foreign
1	**Amazon.com**	United States	E-commerce	573	155	528	138
2	**Apple**	United States	Platforms	383	245	353	84
3	**Alphabet**	United States	Platforms	307	161	402	104
4	**Microsoft**	United States	Digital solutions	212	105	412	160
5	**JD.com**	China	E-commerce	153	2	89	0
6	**Meta Platforms**	United States	Platforms	135	85	230	37
7	**Alibaba Group Holding**	China	E-commerce	126	13	255	10
8	**Bytedance**	China	Platforms	120	40	NA	NA
9	**Walt Disney**	United States	Digital content	89	19	206	23
10	**Tencent Holdings**	China	Digital content	86	8	222	80
11	**International Business Machines**	United States	Digital solutions	62	62	135	135
12	**Oracle**	United States	Digital solutions	50	8	134	16
13	**Ingram Micro Holding**	United States	Digital solutions	48	31	18	9
14	**Meituan**	China	E-commerce	39	NA	41	0
15	**Uber Technologies**	United States	Platforms	37	19	39	4
16	**PDD Holdings**	China	E-commerce	35	1	49	1
17	**SAP**	Germany	Digital solutions	34	29	75	62
18	**Netflix**	United States	Digital content	34	19	49	12
19	**Shein Group**	China	E-commerce	33	33	NA	NA
20	**Salesforce**	United States	Digital solutions	31	10	99	14
21	**PayPal Holdings**	United States	Digital solutions	30	13	82	11
22	**Hewlett Packard Enterprise**	United States	Digital solutions	29	19	57	48
23	**Tata Consultancy Services**	India	Digital solutions	27	26	17	5
24	**DiDi Global**	China	Platforms	27	2	20	14
25	**NEC**	Japan	Digital solutions	25	7	300	153
26	**CDW**	United States	Digital solutions	21	3	13	3
27	**Booking Holdings**	United States	E-commerce	21	19	24	21
28	**Adobe**	United States	Digital solutions	19	9	30	4
29	**Cognizant Technology Solutions**	United States	Digital solutions	19	5	18	13
30	**Baidu**	China	Platforms	19	NA	57	0
31	**Automatic Data Processing**	United States	Digital solutions	18	2	51	6
32	**Ant Group**	China	Digital solutions	17	1	39	24
33	**Kyndryl Holdings**	United States	Digital solutions	17	12	11	8
34	**Rakuten Group**	Japan	E-commerce	15	2	160	42
35	**Spotify Technology**	Luxembourg	Digital content	15	15	9	9
36	**Mercado Libre**	Argentina	E-commerce	14	11	18	15
37	**DXC Technology**	United States	Digital solutions	14	10	16	10
38	**Sea**	Singapore	E-commerce	13	4	19	5
39	**Expedia Group**	United States	E-commerce	13	5	22	1
40	**S&P Global**	United States	Digital content	12	5	61	55
41	**Flutter Entertainment**	United States	Digital content	12	7	25	17
42	**Zalando**	Germany	E-commerce	11	6	9	0
43	**Wipro**	India	Digital solutions	11	11	14	0
44	**Delivery Hero**	Germany	E-commerce	11	11	12	12
45	**Ebay**	United States	Platforms	10	4	22	2
46	**Airbnb**	United States	Platforms	10	5	21	0
47	**Fidelity National Information Services**	United States	Digital solutions	10	2	55	5
48	**Insight Enterprises**	United States	Digital solutions	9	2	6	1
49	**ServiceNow**	United States	Platforms	9	3	17	6
50	**Computacenter**	United Kingdom	Digital solutions	9	7	4	3
51	**Constellation Software**	Canada	Digital solutions	8	8	11	10
52	**Equinix**	United States	Digital solutions	8	5	33	18
53	**Nu Holdings**	Brazil	Digital solutions	8	1	43	6
54	**Science Applications International**	United States	Digital solutions	8	0	6	0
55	**Naver**	Republic of Korea	Platforms	7	1	28	12
56	**Electronic Arts**	United States	Digital content	7	4	13	3
57	**Beijing United Information Technology**	China	E-commerce	7	0	2	0
58	**Bechtle**	Germany	E-commerce	7	2	4	2
59	**Shopify**	Canada	E-commerce	7	7	11	2
60	**Palo Alto Networks**	United States	Digital solutions	7	2	15	5
61	**CACI International**	United States	Digital solutions	7	0	7	0
62	**Dassault Systemes**	France	Digital solutions	7	6	16	13
63	**Workday**	United States	Digital solutions	6	6	13	13
64	**Roper Technologies**	United States	Digital solutions	6	1	28	2
65	**Entain**	United Kingdom	Digital content	6	3	14	9
66	**Wolters Kluwer**	Netherlands	Digital content	6	6	10	9
67	**Amadeus IT Group**	Spain	E-commerce	6	6	12	10
68	**Naspers**	South Africa	E-commerce	6	5	65	25

Annex table A.1
Top 100 digital enterprises by sales, 2025
(Concluded)

Rank	Company name	Country of headquarters	Industry classification	Sales (Billions of dollars)		Assets (Billions of dollars)	
				Total	Foreign	Total	Foreign
69	**Kakao**	Republic of Korea	Platforms	6	1	19	3
70	**Just Eat Takeaway.com**	Netherlands	E-commerce	6	5	11	11
71	**SS&C Technologies Holdings**	United States	Digital content	6	2	18	5
72	**Take-Two Interactive Software**	United States	Digital content	5	2	16	7
73	**Fortinet**	United States	Digital solutions	5	4	7	2
74	**Datatec**	South Africa	Digital solutions	5	5	4	3
75	**Autodesk**	United States	Digital solutions	5	3	9	3
76	**Amdocs**	United States	Digital solutions	5	1	6	6
77	**Epam Systems**	United States	Digital solutions	5	2	4	4
78	**Snap**	United States	Platforms	5	1	8	3
79	**IAC**	United States	Platforms	4	1	10	0
80	**International Game Technology**	United Kingdom	Digital content	4	4	10	10
81	**GoDaddy**	United States	Digital solutions	4	1	8	2
82	**NCR Atleos**	United States	Digital solutions	4	2	6	3
83	**Equifax**	United States	Digital content	4	4	12	4
84	**Copart**	United States	E-commerce	4	1	7	1
85	**NCR Voyix**	United States	Digital solutions	4	1	5	1
86	**Conduent**	United States	Digital solutions	4	0	3	1
87	**Atlassian**	Australia	Digital solutions	4	3	4	4
88	**Match Group**	United States	Platforms	3	2	5	1
89	**Tietoevry Oyj**	Finland	Digital solutions	3	2	4	3
90	**Pinterest**	United States	Platforms	3	1	4	2
91	**Rackspace Technology**	United States	Digital solutions	3	1	4	1
92	**F5**	United States	Digital solutions	3	1	5	1
93	**Verisk Analytics**	United States	Digital content	3	0	4	1
94	**THG**	United Kingdom	E-commerce	3	1	4	0
95	**Square Enix Holdings**	Japan	Digital content	3	1	3	0
96	**Deliveroo**	United Kingdom	E-commerce	3	1	1	0
97	**Ubisoft Entertainment**	France	Digital content	3	3	5	1
98	**Konami**	Japan	Digital content	2	1	4	0
99	**CoStar Group**	United States	E-commerce	2	0	9	0
100	**Joyy**	Singapore	Platforms	2	2	8	8
Total				**3 327**	**1 394**	**5 106**	**1 616**

Source: UNCTAD.

Note: Data are for fiscal year 2023.

Annex table A.2
Top 100 ICT enterprises by sales, 2025

Rank	Company name	Country of headquarters	Industry classification	Sales (Billions of dollars) Total	Sales (Billions of dollars) Foreign	Assets (Billions of dollars) Total	Assets (Billions of dollars) Foreign
1	**Apple Inc**	United States	IT devices	383	245	353	84
2	**Hon Hai Precision Industry**	Taiwan Province of China	Semiconductors	201	197	128	119
3	**Samsung Electronics**	Republic of Korea	IT devices	200	165	352	79
4	**China Mobile**	China	Telecommunications	143	5	281	12
5	**Deutsche Telekom**	Germany	Telecommunications	124	95	320	258
6	**AT&T**	United States	Telecommunications	122	5	407	13
7	**Comcast**	United States	Telecommunications	122	27	265	49
8	**China Communications Construction**	China	Telecommunications	107	16	237	37
9	**Dell Technologies**	United States	IT devices	102	53	90	30
10	**Huawei Investment & Holding**	China	IT devices	99	33	178	98
11	**Nippon Telegraph and Telephone**	Japan	Telecommunications	99	21	191	85
12	**Sony Group**	Japan	IT devices	83	62	235	149
13	**Hitachi**	Japan	IT devices	80	50	94	80
14	**China Telecom**	China	Telecommunications	72	1	118	3
15	**Taiwan Semiconductor Manufacturing**	Taiwan Province of China	Semiconductors	70	66	180	35
16	**LG Electronics**	Republic of Korea	IT devices	65	39	47	15
17	**Panasonic Holdings**	Japan	IT devices	63	38	61	40
18	**Lenovo Group**	China	IT devices	62	45	39	27
19	**International Business Machines**	United States	IT devices	62	30	135	50
20	**TD Synnex**	United States	IT devices	58	27	29	4
21	**Cisco Systems**	United States	IT devices	57	27	102	31
22	**Intel**	United States	IT devices	54	37	192	56
23	**HP**	United States	IT devices	54	31	37	12
24	**China United Network Communications**	China	Telecommunications	52	1	93	3
25	**Oracle**	United States	IT devices	50	8	134	16
26	**Orange**	France	Telecommunications	49	26	121	63
27	**America Movil**	Mexico	Telecommunications	48	28	92	63
28	**Telefonica**	Spain	Telecommunications	45	31	115	82
29	**Pegatron**	Taiwan Province of China	IT devices	41	38	18	15
30	**Vodafone Group**	United Kingdom	Telecommunications	41	34	169	154
31	**Schneider Electric**	France	Semiconductors	39	37	65	60
32	**Xiaomi**	China	IT devices	38	17	46	NA
33	**Qualcomm**	United States	Semiconductors	36	35	51	33
34	**Broadcom**	United States	Semiconductors	36	29	73	26
35	**Quanta Computer**	Taiwan Province of China	IT devices	35	35	22	16
36	**Jabil**	United States	Semiconductors	35	30	19	14
37	**Compal Electronics**	Taiwan Province of China	IT devices	31	26	14	8
38	**ASML Holding**	Netherlands	Semiconductors	30	30	48	19
39	**Hewlett Packard Enterprise**	United States	IT devices	29	19	57	48
40	**Flex**	Singapore	IT devices	29	24	21	18
41	**Wistron**	Taiwan Province of China	Semiconductors	28	25	15	10
42	**Fujitsu**	Japan	IT devices	28	11	25	6
43	**NVIDIA**	United States	Semiconductors	27	19	41	13
44	**Avnet**	United States	Semiconductors	27	20	12	10
45	**Applied Materials**	United States	Semiconductors	27	23	31	2
46	**Telefonaktiebolaget LM Ericsson**	Sweden	IT devices	26	26	30	12
47	**BT Group**	United Kingdom	Telecommunications	25	3	65	2
48	**SK Hynix**	Republic of Korea	Semiconductors	25	24	78	19
49	**NEC**	Japan	IT devices	25	7	30	15
50	**BOE Technology Group**	China	IT devices	25	13	59	6
51	**TCL Technology Group**	China	IT devices	25	10	54	5
52	**Nokia Oyj**	Finland	IT devices	25	23	44	37
53	**Advanced Micro Devices**	United States	Semiconductors	23	15	68	18
54	**WPG Holdings**	Taiwan Province of China	Semiconductors	22	19	10	2
55	**WT Microelectronics**	Taiwan Province of China	Semiconductors	19	17	9	4
56	**Saudi Telecom**	Saudi Arabia	Telecommunications	19	2	43	10
57	**ASE Technology Holding**	Taiwan Province of China	Semiconductors	19	17	22	7
58	**Telecom Italia**	Italy	Telecommunications	18	5	69	11
59	**Texas Instruments**	United States	Semiconductors	18	12	32	4
60	**ZTE**	China	Telecommunications	18	5	28	2
61	**Lam Research**	United States	Semiconductors	17	16	19	7
62	**ST Microelectronics**	Switzerland	Semiconductors	17	12	24	21
63	**Infineon Technologies**	Germany	Semiconductors	17	15	30	24
64	**Bharti Airtel**	India	Telecommunications	17	6	54	12
65	**Inventec**	Taiwan Province of China	IT devices	17	14	8	6
66	**Tokyo Electron**	Japan	Semiconductors	17	15	17	5
67	**Asustek Computer**	Taiwan Province of China	IT devices	16	14	16	4
68	**Micron Technology**	United States	Semiconductors	16	8	64	56

Annex table A.2
Top 100 ICT enterprises by sales, 2025
(Concluded)

Rank	Company name	Country of headquarters	Industry classification	Sales (Billions of dollars)		Assets (Billions of dollars)	
				Total	Foreign	Total	Foreign
69	**Kyocera**	Japan	Semiconductors	15	11	31	18
70	**Telstra Group**	Australia	Telecommunications	15	1	30	4
71	**Emirates Telecommunications Group**	United Arab Emirates	Telecommunications	15	5	40	20
72	**Mediatek**	Taiwan Province of China	Semiconductors	14	13	21	5
73	**NXP Semiconductors**	Netherlands	Semiconductors	13	13	24	22
74	**Swisscom**	Switzerland	Telecommunications	13	3	29	5
75	**Synnex Technology International**	Taiwan Province of China	IT devices	13	11	7	5
76	**Murata Manufacturing**	Japan	Semiconductors	13	12	22	8
77	**Corning**	United States	IT devices	13	8	29	16
78	**Hangzhou Hikvision Digital Technology**	China	IT devices	13	4	20	1
79	**Amphenol**	United States	Semiconductors	13	8	17	12
80	**Western Digital**	United States	IT devices	12	9	25	17
81	**Analog Devices**	United States	Semiconductors	12	8	49	25
82	**MTN Group**	South Africa	Telecommunications	12	9	24	13
83	**Also Holding**	Switzerland	Telecommunications	11	10	4	3
84	**Singapore Telecommunications**	Singapore	Telecommunications	11	6	35	20
85	**KLA**	United States	Semiconductors	10	9	14	5
86	**Renesas Electronics**	Japan	Semiconductors	10	8	22	4
87	**TCL Electronics Holdings**	Hong Kong, China	IT devices	10	6	8	2
88	**Minebea Mitsumi**	Japan	Semiconductors	10	7	10	5
89	**Telkom Indonesia (Persero)**	Indonesia	Telecommunications	10	1	19	0
90	**Kioxia Holdings**	Japan	Semiconductors	10	8	22	0
91	**Sanmina**	United States	Semiconductors	9	8	5	2
92	**Telia Company**	Sweden	Telecommunications	9	4	22	14
93	**Wingtech Technology**	China	IT devices	9	6	11	8
94	**Universal Scientific Industrial Shanghai**	China	Semiconductors	9	8	0	0
95	**Microchip Technology**	United States	Semiconductors	8	6	0	0
96	**ON Semiconductor**	United States	Semiconductors	8	7	0	0
97	**Oman Telecommunications**	Oman	Telecommunications	8	6	20	16
98	**Liberty Global**	United Kingdom	Telecommunications	7	7	42	42
99	**Ooredoo**	Qatar	Telecommunications	6	4	16	12
100	**Cellnex Telecom**	Spain	Telecommunications	4	4	49	45
Total				**4 090**	**2 387**	**6 891**	**2 681**

Source: UNCTAD.