

# ASIA-PACIFIC TRADE AND INVESTMENT REPORT 2023/24

*Unleashing Digital Trade and Investment  
for Sustainable Development*



**ESCAP**  
Economic and Social Commission  
for Asia and the Pacific



UNITED NATIONS  
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**UNIDO**



*The shaded areas of the map indicate ESCAP members and associate members.\**

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**UNITED NATIONS**

**United Nations Economic  
and Social Commission  
for the Asia and Pacific**

**United Nations Conference on  
Trade and Development**

**United Nations Industrial  
Development Organization**

**United Nations Economic and Social Commission for Asia and the Pacific**  
**United Nations Conference on Trade and Development**  
**United Nations Industrial Development Organization**

**ASIA-PACIFIC**  
**TRADE AND INVESTMENT REPORT 2023/24**

*Unleashing Digital Trade and Investment for Sustainable Development*

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## FOREWORD

Digital technologies are revolutionizing the landscape of international trade and investment. As digital trade gains momentum, disparities in readiness are accentuating pre-existing inequalities. Countries and communities that are ill-prepared to seize these opportunities risk losing out on fundamental drivers of contemporary economic growth, societal development, and environmental conservation.

Trade and investment authorities are grappling with a pressing challenge: How can digital trade and investment policies be crafted to simultaneously drive growth and cater to societal and environmental imperatives? This core inquiry is the focus of the Asia-Pacific Trade and Investment Report, “Unleashing Digital Trade and Investment for Sustainable Development.”

The report, jointly prepared by the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP), the United Nations Conference on Trade and Development (UNCTAD) and the United Nations Industrial Development Organization (UNIDO), delves into both the potential and obstacles associated with digital trade and investment. It reveals that addressing social and environmental challenges arising from digital trade and investment is a complex matter, mainly due to the diverse impacts that no single ministry or agency can manage in isolation. However, it also highlights how trade and investment policies can play a role in mitigating these challenges and in enabling the benefits.

The report seeks to broaden the perspectives of policymakers and is expected to stimulate policy dialogues and inter-ministerial and public-private sector collaboration. It advocates for a cohesive strategy at both the global and regional levels to reap greater benefits from digital trade and investment and to maintain focus on the Sustainable Development Goals (SDGs). Much remains to be done to make digital trade and investment policies more inclusive, including by harmonizing policy and regulations across borders and building capacity in less developed countries. ESCAP, UNIDO and UNCTAD look forward to supporting this process.

**Gerd Müller**  
Director-General, UNIDO

**Armida Salsiah Alisjahbana**  
Executive Secretary, ESCAP

**Rebeca Grynszan**  
Secretary-General, UNCTAD





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## ABBREVIATIONS AND ACRONYMS

A3C	Australian Cyber Collaboration Centre
ACRF	ASEAN Comprehensive Recovery Framework
ADB	Asian Development Bank
AEC	ASEAN Agreement on Electronic Commerce
AI	artificial intelligence
AP	Asia Pacific
APAs	advance price agreements
APEC	Asia-Pacific Economic Cooperation
APTA	Asia-Pacific Trade Agreement
APTAD	Asia-Pacific Trade and Investment Agreement Database
APTIR	Asia-Pacific Trade and Investment Report
ASDEA	Australia-Singapore Digital Economy Agreement
ASYCUDA	Automated System for Customs Data
ASEAN	Association of Southeast Asian Nations
B2B	business-to-business
B2C	business-to-consumer
BaTiS	OECD-WTO Balanced Trade in Services dataset
BCR	binding corporate rules
BEPS	Base Erosion and Profit Shifting
CABs	Conformity Assessment Bodies
CAGR	Compound Annual Growth Rate
CAC	Cyberspace Administration of China
CBDT	Cross-border Data Transfer
CBEC	Cross-border E-Commerce
CBPR	Cross-border Privacy Rules
CGE	computable general equilibrium
CO <sub>2</sub>	carbon dioxide
CPTA	Cross-border Paperless Trade in Asia and the Pacific
CPTPP	Comprehensive and Progressive Agreement for Trans-Pacific Partnership
DCs	developing countries
DEA	digital economy agreement
DEPA	Digital Economy Partnership Agreement
Digital IDs	digital identities
DPA	Digital Policy Alert
DPIA	data protection impact assessments
DPO	data protection officers
DPTM	data protection trustmark
DPVs	digital provision variables
DSTRI	OECD Digital Services Trade Restrictiveness Index
DT	digital trade
DTP	digital trade provision
DTPC	digital trade per capita
DTV	digital trade variable

EAEU	Eurasian Economic Union
EBOPS	Extended Balance of Payments Services Classification
ECA	United Nations Economic Commission for Africa
ECC	United Nations Convention on the Use of Electronic Communications in International Contracts
ECLAC	United Nations Economic Commission for Latin America and the Caribbean
ECOTA	Economic Cooperation Organization Trade Agreement
EEE	Electrical and Electronic Equipment
EFTA	European Free Trade Association
eKYC	electronic Know Your Customer
EMFs	electronic magnetic fields
ENEA	East and North-East Asia
EPR	extended producer responsibility
ERIA	Economic Research Institute for ASEAN and East Asia
ESCAP	United Nations Economic and Social Commission for Asia and the Pacific
EU	European Union
FDI	foreign direct investment
FOB	free on board
FTA	free trade agreement
FTZs	free trade zones
G20	Group of 20
GATS	General Agreement on Trade in Services
GATT	General Agreement on Tariffs and Trade
GCC	Gulf Cooperation Council
GDP	gross domestic product
GDPR	General Data Protection Regulation
GEMPACK	General Equilibrium Modelling PACKAge
GeTS	Global eTrade Services
GII	WIPO Global Innovation Index
GPA	Government Procurement Agreement
GPFI	Global Partnership for Financial Inclusion
GQII	Global Quality Infrastructure Index
GSMA	Global System for Mobile Communications Association
GST	goods and services tax
GTAP	Global Trade Analysis Project
GUAM	Organization for Democracy and Economic Development Free Trade Zone
GVC	global value chain
HR	human resources
HS	harmonized system
ICT	information and communication technology
ID	identity/identification
IDs	identification documents
IFC	International Finance Corporation
ILO	International Labour Organization
IMF	International Monetary Fund
IOS	iPhone operating system
IoT	Internet of Things
IP	intellectual property



IPAs	investment promotion agencies
IPEF	Indo-Pacific Economic Framework for Prosperity
IPR	intellectual property right
ISO	International Organization for Standardization
ISPs	internet services providers
IT	information technology
ITA	Information Technology Agreement
ITeS	information technology enabled service
ITM	industry transformation map
ITU	International Telecommunication Union
JSI	Joint Statement Initiative
LCRs	local content requirements
LDC	least developed country
LDCs	least developed countries
LLDC	landlocked developing country
LLDCs	landlocked developing countries
M&A	mergers and acquisitions
MC13	WTO 13 <sup>th</sup> Ministerial Conference
MCC	Model Contractual Clauses
MDEC	Malaysian Digital Economy Corporation
MDGs	Millennium Development Goals
MIDA	Malaysian Investment Development Authority
ML	machine learning
MLETR	UNCITRAL Model Law on Electronic Transferable Records
MLIT	UNCITRAL Model Law on the Use and Cross-border Recognition of Identity Management and Trust Services
MNE	multinational enterprise
MRA	mutual recognition agreement
MSG	Melanesian Spearhead Group
MSME	micro-, small- and medium-sized enterprise
NCA	North and Central Asia
NTB	non-tariff barriers to trade
NTFC	national trade facilitation committee
NTM	non-tariff measures
NTP	Networked Trade Platform
OECD	Organisation for Economic Co-operation and Development
OSS	one stop service
P2P	peer-to-peer
PACER	Pacific Agreement on Closer Economic Relations
PDP	personal data protection
PI	personal information
PICTA	Pacific Island Countries Trade Agreement
PIDEs	Pacific Islands Developing Economies
PIF	Pacific Island Forum
PSG	Productivity Solutions Grant
PTA	preferential trade agreement
R&D	research and development
RCEP	Regional Comprehensive Economic Partnership

RDTII	UNRC Regional Digital Trade Integration Index
RTA	regional trade agreement
SAFTA	South Asian Free Trade Area
SCYCLE	Sustainable Cycles Programme
SDG	Sustainable Development Goal
SDoCs	self-declarations of conformity
SEA	South-East Asia
SeT4SME	Small Package E-Trade for SMEs
SEZs	special economic zones
SHTP	Saigon Hi-tech Park
SIM	subscriber identity module
SME	small- and medium-sized enterprise
SPARTECA	South Pacific Regional Trade and Economic Cooperation Agreement
SSG	SkillsFuture Singapore
SSWA	South and South-West Asia
STEM	science, technology, engineering and mathematics
TAPED	Trade Agreements Provisions on Electronic-commerce and Data
TBT	technical barriers to trade
TFA	WTO Trade Facilitation Agreement
TFP	total factor productivity
TPP	Trans-Pacific Partnership
TRIMs	WTO Trade-Related Investment Measures
TRIPs	WTO Trade-Related Aspects of Intellectual Property Rights
UNCITRAL	United Nations Commission on International Trade Law
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNIDO	United Nations Industrial Development Organization
UNRC	United Nations Regional Commission
UNSD	United Nations Statistics Division
UNTF	United Nations Trade Facilitation Survey
USA	United States of America
USAID	United States Agency for International Development
USITC	United States International Trade Commission
USMCA	United States-Mexico-Canada Agreement
VAT	value-added tax
WB	World Bank
WCO	World Customs Organization
WEEE	Waste Electrical and Electronic Equipment
WEF	World Economic Forum
WHO	World Health Organization
WIPO	World Intellectual Property Organization
WSG	Workforce Singapore
WTO	World Trade Organization
3D	three dimensional
5G	fifth generation (of wireless technology)

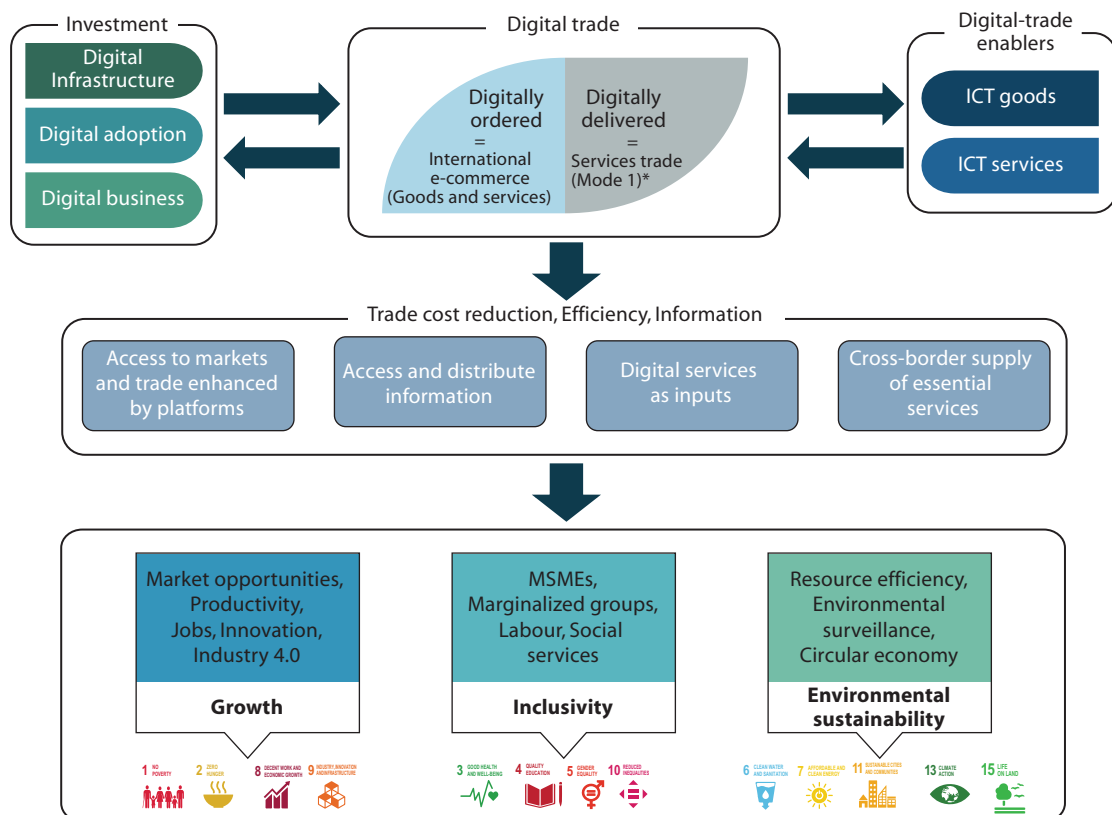
# EXECUTIVE SUMMARY

To harness the potential of digital trade and investment for sustainable development, it is essential to carefully craft trade and investment policies. These policies should take into account the related societal and environmental opportunities and challenges. This report presents an integrated approach to policy-making, aimed at enhancing the understanding of trade and investment policymakers regarding their roles in realizing the potential of digital trade and investment as effective means for the achievement of the Sustainable Development Goals (SDGs).

## The role of digital trade and investment in sustainable development

**‘Digital trade’** encompasses all international trade transactions that are digitally ordered or delivered. In the developing regions of the Asia-Pacific, the growth of digital trade is largely dependent on foreign direct investment (FDI) for the development of digital infrastructure, digital technology adoption and digital businesses. This **‘digital FDI’** provides essential capital, expertise, and cutting-edge technologies, which are vital for establishing a competitive stance in digital trade. Moreover, digital trade necessitates Information and Communication Technology (ICT) networks, equipment, and services. These **‘digital-trade enablers’** facilitate the process of ordering and delivering all digital trade transactions.

**Figure 1. Digital trade and SDGs**



Source: ESCAP.

Note: \* Only digitally deliverable services.

**Digital trade and investment present a promising means for economies in the Asia-Pacific region to achieve the SDGs.** Central to this dynamic are digitally deliverable services, notably those associated with data, online platforms and services facilitating online transactions. Empirical studies conducted by United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) and the United Nations Industrial Development Organization (UNIDO) found a positive relationship between increased digital trade and overall progress towards the SDGs. This association was especially pronounced for SDG targets connected to social development.

**The benefits derived from digital trade are closely tied to Internet penetration. Thus, unlocking the full potential of digital trade urgently calls for bridging the digital divide.** ESCAP research suggests that a 1% increase in digital trade value is associated with a 0.8 percentage point rise in the growth rate of an economy's real Gross Domestic Product (GDP) per capita. Additionally, the study finds that the positive outcomes of digital trade are often reliant on widespread internet access. The results underscore the importance of addressing the digital divide. This is especially urgent for Least Developed Countries (LDCs), the economies of South- and South-West Asia (SSWA), Pacific Islands Developing Economies (PIDEs) and Land-Locked Developing Countries (LLDCs).

## **Trends in digital trade and investment in Asia and the Pacific**

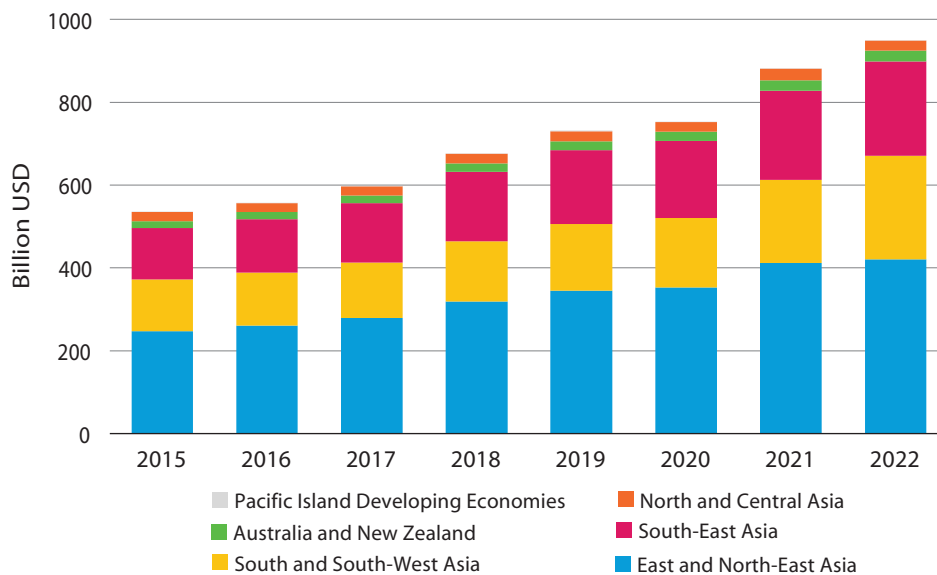
**Digital trade has become an important component of global trade.** In 2022, global exports of digitally deliverable services reached US\$ 3.9 trillion, constituting 55% of the total global services trade. In the same period, the Asia-Pacific region exported digitally deliverable services valued at approximately US\$ 958 billion, representing 52% of the region's total services exports.

**The Asia-Pacific region has emerged as a dynamic player in digital trade.** From 2015 to 2022, the region's growth rate in digitally deliverable exports was nearly 9% per year, outperforming the global average of approximately 6.8%. An important driver of this growth has been the increasing intraregional demand, as evidenced by the rise in the proportion of intra-regional exports from 36% to 39% during the same period.

**Opportunities in digital trade and investment are highly concentrated in six economies of the region.** Similar to traditional trade trends, economies in North and Central Asia (NCA), South Asia and the developing Pacific have accounted for insignificant shares in digital trade. The export landscape is markedly concentrated; just six economies represent 85% of the region's digitally deliverable exports. Of these six, four are from the East and North-East Asian subregion (ENEA), which contributed almost 44% of the region's exports of digitally deliverable services in 2022. A similar trend is evident in digital FDI inflows, with a significant portion channelled to ENEA, South-East Asia (SEA) and India.

**Asia-Pacific LDCs have seen rapid growth in digital trade, but further growth and engagement is constrained.** Only 0.10% of the region's digital FDI inflows were channelled towards the Asia-Pacific LDCs in 2021, suggesting possible underinvestment in crucial infrastructure and digital businesses necessary for enhancing their competitiveness in digital trade. In addition, these countries also grapple with other challenges. Notable challenges include a shortfall of workers equipped with the necessary skills and regulatory issues pertaining to data protection and online transactions, which drive up operational costs for digital enterprises. As a result of such obstacles, the Asia-Pacific LDCs accounted for less than 1% of the region's exports of digitally deliverable services in 2022.

**Figure 2. Digitally deliverable service exports by Asia-Pacific subregions**



Source: UNCTAD, based on UNCTAD Digital Economy Database (<https://unctadstat.unctad.org/wds/>).

Note: Trade value includes inter-regional trade.

## Trends and development in digital trade and investment policies in Asia and the Pacific

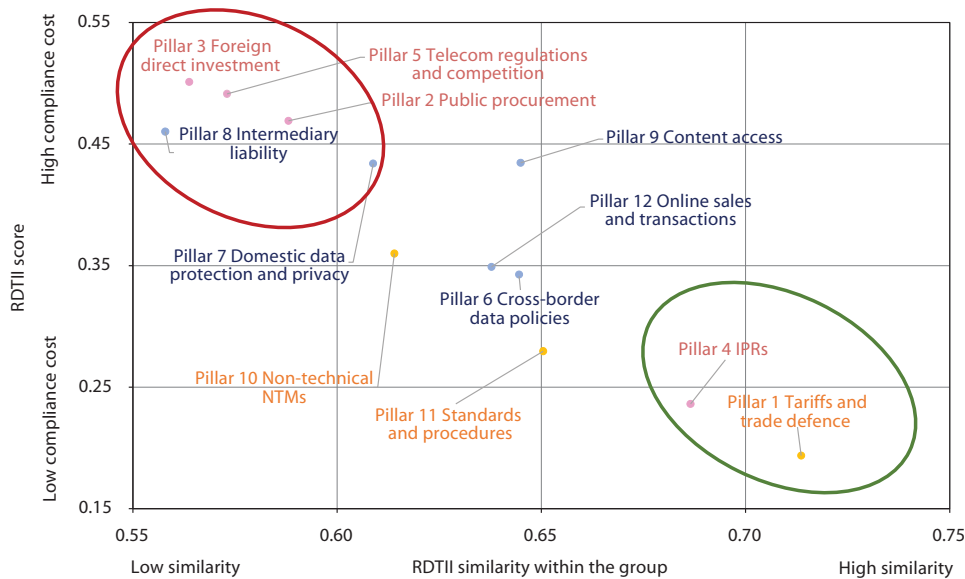
**The digital trade policy environment in the Asia-Pacific region exhibits a dual-pronged approach.** On one side, there is a shift towards regulatory simplification, prominently in areas like tariffs, trade facilitation and intellectual property rights (IPRs). Such policy development is expected to boost digital trade, mitigate costs, and amplify competition. However, when one delves into the policies pertaining to digital service trade, investment and the overarching framework for digital governance, there is a growing trend towards stringent policy enforcement. This rigorous approach is more prevalent, on average, in the NCA and SSWA economies.

### Policies affecting infrastructure and cost of access

**State monopolies are quite common in telecommunications services in the Asia-Pacific region.** Robust competition in the telecom market can improve coverage and reduce consumer costs. Achieving this necessitates prioritizing private investment and reducing trade and investment barriers for ICT goods and services. From 2007 to 2022, the telecom regulatory landscape in the Asia-Pacific region improved significantly. However, many LDCs, LLDCs, and PIDEs remain entrenched in state monopolies. In several economies, particularly in NCA, licensing often carries nationality and residency requirements.

**Trade in ICT products is frequently subjected to Non-Tariff Measures (NTMs). The compliance cost becomes significant when these measures deviate from international standards.** While tariffs on ICT goods are generally low, there are significant exceptions, especially in LDCs and SSWA economies. Furthermore, across the region, there are varied technical standards, intricate certification processes, and Local Content Requirements (LCRs). Adopting international standards, streamlining business approval processes, and implementing the World Trade Organization's Information Technology Agreement (WTO ITA) and Trade-Related Investment Measures (TRIMs) Agreement should be actively considered by policymakers in the Asia-Pacific region.

**Figure 3. Digital-trade policy landscape in the Asia-Pacific region, 2022**



Source: ESCAP, based on the Regional Digital Trade Integration Index (RDTII) database (<https://dtri.uneca.org/escap/home>).

## Policies affecting costs and trust in digital trade

**Paperless trade is key for reducing trade costs for cross-border e-commerce.** In the Asia-Pacific region, implementation of paperless trade measures rose from 56% in 2019 to 66% in 2023 according to the United Nations Survey on Digital and Sustainable Trade Facilitation. However, the adoption of cross-border paperless trade facilitation is still progressing slowly, currently at 42%, an increase from the previous 31%. Economies in the PIDEs and the SSWA subregion are notably lagging behind.

**The region has made progress in online consumer protection frameworks, but they vary in nature.** Comprehensive regulations are needed to address each stage of online transactions, from advertising to solving post-purchase disputes. While many regional economies have extensive consumer protection and cybersecurity laws, they are diverse in nature given the absence of widely accepted international guidelines. Moreover, remedies for cross-border online transaction disputes are lacking, although promising regional frameworks are in the pipeline via Asia-Pacific Economic Cooperation (APEC) and Association of Southeast Asian Nations (ASEAN) initiatives.

**Stringent data regulations are particularly prevalent in NCA, followed by SSWA.** While data regulations can foster trust and propel the digital economy, overly complex rules hinder cross-border businesses, particularly for Micro-, Small- and Medium-sized Enterprises (MSMEs). Fifty-seven per cent of the Asia-Pacific economies, covered in the Organisation for Economic Co-operation and Development (OECD)'s Digital Services Trade Restrictiveness Index (DSTRI), allow sharing personal data with economies offering comparable privacy safeguards. However, there is no clear benchmark of equivalence and standards for data-sharing protocol. Similarly, most of them have cybersecurity laws, but few align with international treaties.

**Fiscal incentives, digital Special Economic Zones (SEZs), and regulatory sandboxes are deployed to attract FDI. However, stringent ownership and licensing regulations potentially counteract these incentives.** Foreign ownership caps on digital FDI are in place in 77% of the economies covered in ESCAP's RDTII, and licensing requirements are present in 64% of them. Investment restrictions are most pronounced in NCA and are also notable in SSWA. Some major economies in the region are easing these constraints, albeit in a fragmented manner.



## Policies affecting innovation and Industry 4.0

**There is a rising focus on IPR policies to boost investor confidence in research and development (R&D) and innovation.** Increased participation in the WTO Trade-Related Aspects of Intellectual Property Rights (TRIPs) Agreement and several treaties of the World Intellectual Property Organization (WIPO) reflects the region's commitment to balancing the protection of proprietary rights with public access, fostering innovation. By September 2023, about 61% of the Asia-Pacific economies had committed to the WTO TRIPS Agreement. In addition, half of these economies ratified the WIPO Patent Cooperation Treaty (PCT), while 51% joined the WIPO Copyright Treaty. However, most regional economies are not part of the WTO Government Procurement Agreement (GPA) and the prevailing tendency is to limit foreign involvement in public procurement in the digital realm. Data from ESCAP's RDTII reveal that numerous Asia-Pacific economies still lack clear encryption guidelines and self-certification mechanisms for technical standards related to Industry 4.0.

## Promoting sustainable development in digital trade: The role of trade and complementary policies

### Digital trade for inclusivity

**To ensure inclusivity in digital trade, policies should prioritize competitive equity for both large and small enterprises rather than simply differentiating between offline and online entities.** MSMEs constitute more than 90% of businesses and 70% of jobs in many Asia-Pacific economies. The micro firms are often the primary avenue through which underserved groups, especially women, participate in digital trade.

**With the phasing out of tax-free digital trade, streamlining of trade processes is essential to counteract rising costs.** At present, MSMEs in digital trade confront increasing challenges due to the diversity and uncertainties in digital trade rules. These challenges also encompass the reduction of De Minimis Thresholds and uncertainties surrounding the renewal of the Moratorium on Customs Duties on Electronic Transmissions.

**Adopting consistent trade and digital governance policies that ensure a broader development perspective, rather than focusing solely on sector-specific benefits, is crucial.** Asia-Pacific economies have already encountered challenges in cross-border delivery of essential services such as e-health-care and e-education, due to barriers to services trade. Digital trade policies that impose restrictions on data flows, as well as regulations around platforms, introduce further hurdles to cross-border digital delivery of these services.

**Challenges concerning taxation and informality faced by digital economy workers can be addressed by incorporating labour-related clauses into trade agreements and engaging in international labour and tax treaties.** This approach is particularly relevant in developing Asia-Pacific economies, where many independent workers in the digital economy lack tax registration and social protections. Furthermore, policymakers can leverage investment and business regulations to foster collaboration with online platforms. For example, they can use digital accounts on platforms to facilitate the registration of workers, ensuring the workers have access to essential social benefits.

### Digital trade for environmental sustainability

**An open digital trade and investment environment is necessary for achieving a circular economy,** which is an economic system aimed at eliminating waste and the continual use of resources. The circular economy requires digitally delivered services such as real-time tracking, data analytics, and cloud-based services for having a complete overview of sustainable supply chains. Additionally, enabling data flow is needed to monitor and trace the movement of materials, products and waste throughout the entire product lifecycle. Complementary measures should include the removal of trade and investment barriers in environmental services, facilitation of trade in waste, recycling, and recycled goods, and alignment with international

eco-labelling standards. However, the growth of digital trade and digital economy increases demand for ICT goods, which in turn escalates e-waste and raises concerns about the risks of illicit transboundary e-waste movements. This underscores the need for international collaborative efforts on pre-emptive trade measures to mitigate the risks.

**Trade digitalization should be accelerated to reduce the impact of trade procedures on the environment.** Research from ESCAP indicates that fully digitalizing trade procedures in the Asia-Pacific region could reduce Carbon Dioxide (CO<sub>2</sub>) emissions by 13 million tons, equivalent to planting 439 million trees. Similarly, a study by the United Nations Conference on Trade and Development (UNCTAD) finds the electronic Single Window in Vanuatu reduced CO<sub>2</sub> emissions by 5,827 kg. Furthermore, the Asia-Pacific Trade and Investment Report (APTIR) 2021 indicates that trade information portals is an efficient tool in reducing energy consumption as they increase transparency and make it easier for traders to access the information needed to fulfil administrative trade requirements.

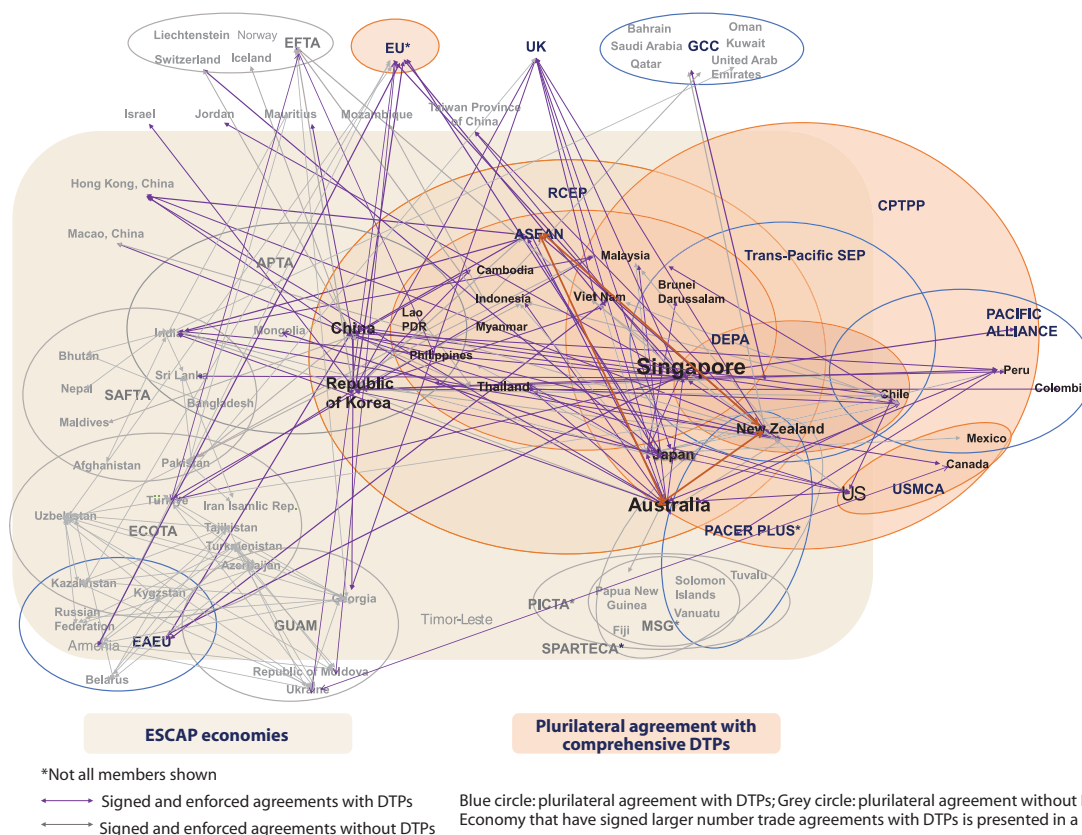
## Achieving sustainable development through multilateral and regional cooperation in digital trade

**Preferential agreements have become an important forum for rulemaking in digital trade.** The Joint Statement Initiative on E-commerce, which involves 89 WTO members, seeks to lay down a foundation for minimum cooperation standards in digital trade, although achieving an ambitious outcome may be challenging. Meanwhile, economies in ENEA and SEA subregions have been proactive in incorporating digital trade provisions (DTPs) into their preferential trade agreements (PTAs), while economies in NCA and SSWA subregions have not kept pace. An analysis of 463 PTAs, 237 of which involve at least one Asia-Pacific economy, reveals a consistent growth in the inclusion of such provisions. However, low- and lower middle-income economies are trailing in this endeavour.

**Cooperation in digital trade rules could potentially act as a catalyst for sustainable development.** To date, most agreements have focused on enabling and facilitating trade digitalization without delving into sensitive areas such as data governance or in-depth digital service commitments. However, there is an obvious trend towards certain common commitments, such as promoting paperless trade and reducing restrictions on cross-border data flows. Despite these commonalities, the degree of obligation within DTPs varies, sometimes significantly, leaving varying degrees of policy space. Nevertheless, there is increasing evidence that including DTPs in trade agreements helps in boosting digital trade, especially in digitally deliverable services, and may also have significant positive impacts across various development areas as well. ESCAP research indicates that 10 additional DTPs in trade agreements are associated with an increase of 0.08 percentage points in the growth rate of an economy's real GDP per capita.

**Cooperation is needed to avoid a new “noodle-bowl” of digital trade agreements, and to facilitate the participation of small developing countries.** Since 2019, Digital Economy Agreements (DEAs), or ‘digital-only’ agreements, have gained traction, addressing a wider scope of emerging issues than PTAs. These DEAs emphasize inclusive digital economies and sustainable development, catering to aspects like MSMEs and regional capacity-building. Moreover, several regional arrangements focused on specific digital trade issues have emerged. Efforts should be made to ensure interoperability across agreements and to include provisions for capacity-building and differential treatment for less advanced countries from the region.

**Figure 4. PTAs with and without Digital Trade Provisions (DTPs) signed by Asia-Pacific economies, 2023**



Source: ESCAP, based on the Asia-Pacific Trade and Investment Agreement Database (APTAD) (<https://www.unescap.org/content/aptiad>) and the ESCAP automated Regional Trade Agreement Text Analyzer (<https://hdl.handle.net/20.500.12870/5429>).

## Sustainability impact of ICT goods trade and digital trade-related policies

**Higher trade and economic growth can be achieved by addressing non-tariff barriers (NTBs) in imports of ICT products under the WTO ITA.** ESCAP employed Computable General Equilibrium (CGE) modelling to examine the impact of various digital trade-related policies on GDP, trade, employment, and CO<sub>2</sub> emission. The analysis shows the effects of tariff cuts in ICT goods as part of implementation of the WTO ITA I and II are negligible to the region as a whole since most large trading economies have already implemented them. In contrast, addressing NTBs on ITA I and II products could significantly increase trade and economic growth, potentially increasing the region's exports by 0.17% and 0.23%, and GDP by 0.07% and 0.06%, respectively. These results suggest that discussions on NTBs on ICT goods should be a trade policy priority in negotiations carried out by the Asia-Pacific economies. Such NTBs could also be addressed unilaterally.

**Asia-Pacific economies could reap sizeable economic gains by reducing policy restrictions that affect digital trade flows, as well as by fully implementing cross-border paperless trade.** The rise in protectionist digital trade policies, as measured by the OECD's DSTRI, is estimated to already reduce the Asia-Pacific region's real GDP by 0.4% annually. Across all subregions, the most pronounced effects are in the NCA subregion. The simulation results show that even partial reductions in restrictive digital trade policy measures could have a positive impact on economic and trade growth. For example, sizable economic benefits are found from marginal reductions in restrictions on cross-border data flows. Another set of positive economic impacts could come from the full implementation of measures aimed at facilitating cross-border paperless trade procedures, as envisaged by the Framework Agreement on Facilitation of Cross-Border Paperless Trade in Asia and the Pacific (CPTA). According to the model results, Asia and the Pacific could realize an increase

of almost 1% in GDP from advancing the CPTA implementation, with the resulting economic benefits shared by every subregion, and with the SEA subregion reaping more benefits in relative terms.

**While the overall net economic effect of policy measures facilitating digital trade is found to be positive, the simulation results suggest that policymakers need to implement policies that support sectoral transitions of employment and business activity to offset potential negative effects in the short term.**

The sectoral impacts of policy measures that facilitate digital trade flows and cross-border paperless trade are uneven and require Governments to mitigate such impacts with supplementary support, including to affected workers. The policy changes simulated in this report reveal that policy measures affecting different domains of digital trade could have contrasting sectoral impacts. For example, simulated reductions in NTBs are found to reduce the output of manufacturing sectors by 0.33%, and to expand the output of the services sector by more than 15% across the Asia-Pacific region. The sectoral impacts of digital trade policy measures are found to be larger than those of conventional trade policies targeting ITA-related products. The simulation results indicate that increases in digital trade restrictions lead to contractions in services sectors, benefiting agriculture and, to a lesser extent, manufacturing across the Asia-Pacific region. Conversely, reduced digital restrictions negatively impact manufacturing and agriculture but benefit the services sector. Changes in skilled and unskilled labour requirements largely align with these sectoral output patterns, although employment shifts in the services sector tend to have a greater impact on unskilled labour.

**Supplementary policies are needed to offset Carbon Dioxide (CO<sub>2</sub>) emissions in expanding sectors.**

The modelling results from ESCAP suggest that removing traditional and digital trade barriers in certain sectors will stimulate economic expansion, leading to a rise in greenhouse gas emissions. Therefore, it is crucial to concurrently introduce additional policies aimed at neutralizing these emissions to ensure environmental sustainability. The most extreme effect was observed in implementation of full digitalization of trade procedures, increasing emissions by 0.41% in the region (while adding 0.89% to the regional GDP). Notably, however, move from manufacturing (contracting under most policies affecting digital trade) to service sectors (expanding) is less carbon intensive in most cases examined.

## Attracting digital FDI to cultivate a sustainable and inclusive economy

**FDI in the digital economy promotes economic growth while supporting sustainable investment approaches.** FDI in digital infrastructure furnishes host economies with crucial capital, technology, expertise and employment opportunities, which are indispensable for developing and preserving digital infrastructure. Investing in the adoption of digital technology is pivotal for digitalizing operations, enhancing resilience and introducing new business opportunities. Simultaneously, FDI in digital businesses brings forward innovative business models that circumvent conventional challenges, forge collaborative ventures with local firms, and promote non-equity modes of FDI in host economies.

**To attract digital FDI, policymakers in trade, investment and ICT must closely collaborate with national Investment Promotion Agencies (IPAs) in crafting cohesive strategies.** The policy framework for digital FDI, especially regarding digital infrastructure, should include a national broadband plan, policies on converged licensing, spectrum allocation, infrastructure sharing, universal service funds, number portability and a dedicated framework for data centres. Success in attracting digital FDI, especially regarding digital business and digital adoption, hinges on digital connectivity, digital proficiency, ease of doing business, and robust digital trade and investment policies. In addition, the digitalization of industrial parks and SEZs is crucial.

## CONCLUSION

Given the rapid growth of the digital economy, ensuring that digital trade and investment lead to inclusive and sustainable development is a challenging endeavour but of paramount importance. This report presents policy recommendations tailored for trade and investment ministries.

A complete set of policy recommendation is available in chapter 8. However, throughout the report, a consistent theme is evident—**Asia-Pacific economies need to reduce policy hurdles that affect digital trade and investment flows, giving particular attention to the regulatory impacts on consumers, small firms, workers and the environment.** This perspective highlights the importance of collaborative efforts across the national, subregional, regional and global levels to ensure consistent trade and investment policy directions. Trade and investment policies should acknowledge the interdependencies between traditional and digital sectors, ensuring alignment with SDGs, and simultaneously promote regulatory interoperability with key partners.

In this report, recurring themes within the policy recommendations include:

**Align policy with WTO core principles.** The report underscores the importance of aligning domestic regulations with the principles of transparency and non-discrimination, ensuring compliance with the minimum requirements stipulated by existing WTO agreement guidelines. It is essential that these principles are consistently upheld across all policy interventions, at unilateral, regional or multilateral levels.

**Leverage existing regional frameworks to enhance cross-border interoperability of digital trade and investment rules.** The Asia-Pacific region should leverage international and regional agreements to address the fragmented regulatory environment in core areas such as data privacy, data transfer, cybersecurity and consumer protection. In addition, a regional joint effort, combined with the liberalization of trade in services crucial for achieving SDGs – such as health, education, and environmental services – is essential. As a starting point, the region should engage in regulatory dialogues, setting the foundation for eventual mutual recognition of protocols and standards. Additionally, PTA partners should prioritize timely notifications of regulatory changes and collaboratively develop regulatory information portals.

**Expedite implementation of paperless trade facilitation agreements.** Governments should accelerate the implementation of the WTO TFA and reference the CPTA and UNCITRAL Model Laws when formulating digital trade facilitation policies. By leveraging these global and regional frameworks, they can significantly enhance cross-border interoperability for e-commerce facilitation, offering substantial benefits for MSMEs. Moreover, fully digitalizing trade regulatory processes in the Asia-Pacific region will reduce adverse impact of trade on the environment.





CHAPTER



# The role of digital trade and investment in sustainable development

Digital trade and investment are taking a central role in the global economy. As the importance of this sector escalates, a key question emerges for trade and investment authorities is how to ensure that digital trade and investment policies are inclusive by benefiting society at large without marginalizing any group and remain environmentally conscientious?

Before answering the question through the rest of this report, this introductory chapter sets the stage outlining its scope, clarifying definitions, and presenting the guiding conceptual framework. In addition, it delves into the opportunities and challenges that digital trade and investment pose in relation to sustainable development.

## 1. DIGITAL TRADE AND INVESTMENT FOR SUSTAINABLE DEVELOPMENT: A CONCEPTUAL FRAMEWORK



*“Digital trade refers to all international trade that is digitally ordered and/or digitally delivered.”*

Digital trade refers to all international trade that is digitally ordered and/or digitally delivered – the International Monetary Fund (IMF), the Organisation for Economic Co-operation and Development (OECD), the United Nations Conference on Trade and Development (UNCTAD) and the World Trade Organization (WTO) (2023).<sup>1</sup> According to the definition, digital trade can be categorized as either digitally ordered trade, digitally delivered trade or both (figure 1.1). Digitally ordered trade refers to the international sale or purchase of a good or service conducted over computer networks using methods specifically designed for placing or receiving orders. This element of digital trade focuses on the digital

medium through which the order is placed. This aspect of digital trade is synonymous with international e-commerce and encompasses transactions in both goods and services. For example, ordering a physical book from an online store would fall under digital trade under the digitally ordered category. On the other hand, digitally delivered trade comprises all service trade transactions delivered remotely over computer networks. Here, the key aspect is the digital method of delivery. Examples include downloadable software, streaming services or online consultancy services. Conceptually, digitally delivered trade aligns with part of Mode 1 of services supply in the General Agreement on Trade in Services (GATS) under the WTO.<sup>2</sup> Some digital trade transactions overlap in being both ordered and delivered digitally, e.g., downloadable software that is ordered online and downloaded online.



*“Investment, particularly FDI, is an important driver of digital trade.”*

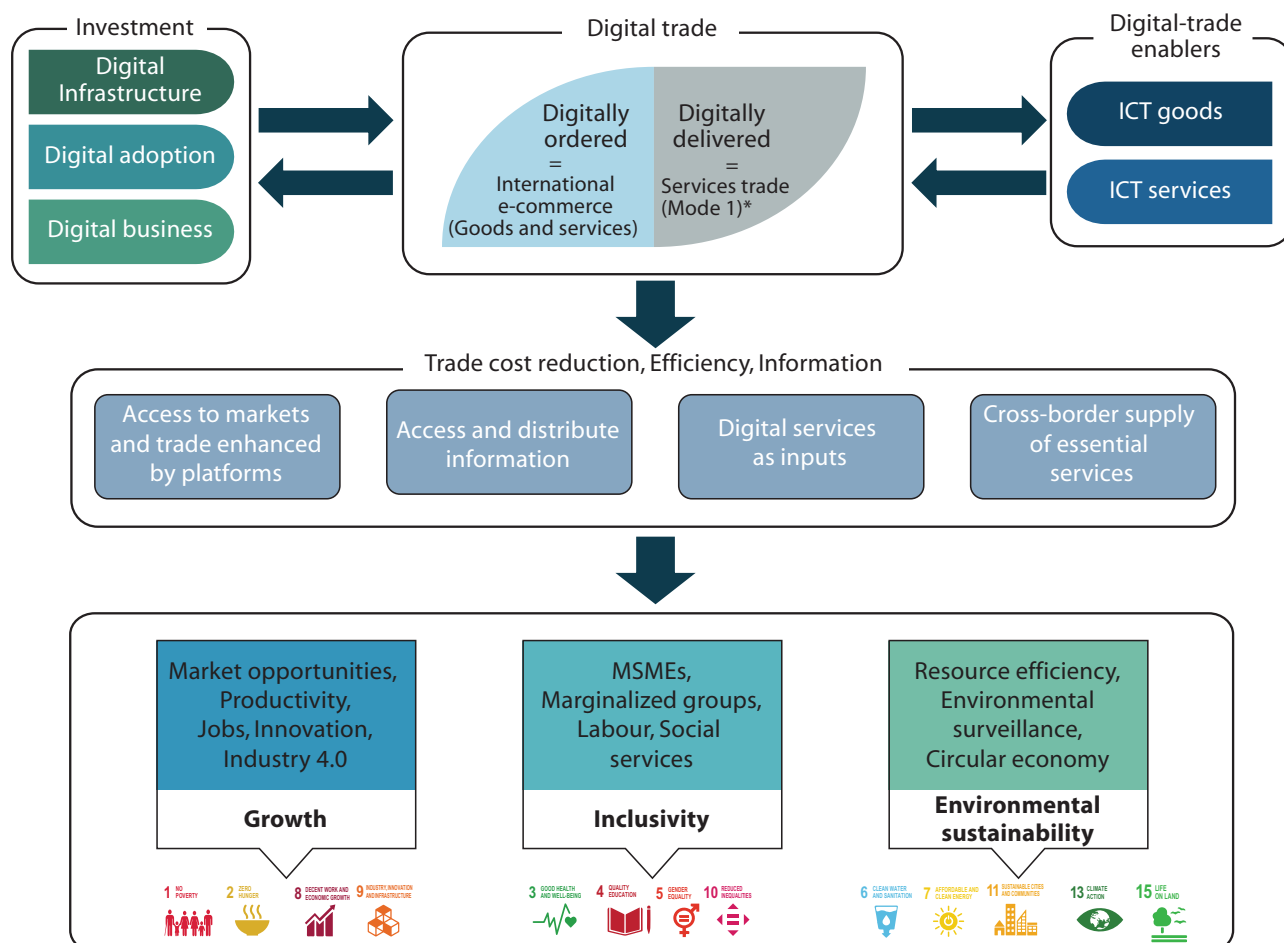
This report takes the view that investment, particularly Foreign Direct Investment (FDI), is an important driver of digital trade. FDI in the digital economy is termed “digital FDI” (WEF, 2020, p.4). By introducing capital, knowledge and technologies to developing economies, digital FDI enhances digital capabilities crucial for establishing competitiveness in digital trade, especially within developing nations. Digital FDI encompasses investments in digital infrastructure, adoption and business operations.<sup>3</sup> Digital infrastructure FDI includes investment in telecommunications and Internet infrastructure, engaging service providers, hardware manufacturers and digital communication software developers.<sup>4</sup> Digital adoption FDI encompasses investments by

<sup>1</sup> There are the often-conflated terms ‘digitization’, ‘digitalization’, and ‘digital transformation’. ‘Digitization’ refers to the conversion of analogue sources (i.e., paper-based) of data into a digital form that can be read/processed by a computer (i.e., ‘electronic’ or ‘digital’ records/data). ‘Digitalization’ is the outcome of digitization. It refers to the use of electronic sources of data for process improvement (e.g., analytics or automation). In contrast, ‘digital transformation’ is the whole process of a system-wide change that involves leveraging digital technologies to all aspects of a business to drive intelligent workflow (Atkinson, 2023).

<sup>2</sup> Digitally delivered trade can arguably be equated with a portion of Mode 1 of services supply as defined in the General Agreement on Trade in Services (GATS) under the WTO. The Mode 1 commitment encompasses services delivered remotely through various mediums, not limited to the Internet but also including phone, mail, etc. Nonetheless, there are different views among WTO member States regarding whether digitally delivered services, like search engines, cloud computing or online gaming—services which did not exist during the scheduling of commitments in the 1990s—are encompassed within the members’ GATS Mode 1 schedules (Meltzer, 2019).

<sup>3</sup> See ESCAP, 2023, Policy Guidebook on Attracting and Promoting FDI in the Digital Economy.

<sup>4</sup> While Governments are heavily investing in digital infrastructure development and multilateral lending institutions, such as the World Bank and Asian Development Bank (ADB) among others support countries via low interest loans and grants, private sector involvement is crucial to closing the investment gap in this realm.

**Digital-trade and SDGs: A conceptual framework**

Source: ESCAP.

Note: \*Only digitally deliverable services, which are services that can be procured and utilized online. Please refer to table 4.1 in the IMF and others(2023) report for a list of services that are digitally deliverable.

traditional firms to incorporate digital technologies. This form of FDI propels digital transformation and expedites economy wide digitalization. Digital business FDI involves investments in digital firms, such as Internet platform providers, and hybrid firms that combine digital and conventional business operation, such as e-commerce sellers and digital content providers.

*"To effectively enhance digital trade, comprehensive frameworks addressing both the goods and services aspects of digital trade enablers are crucial."*

Digital trade, powered by ICT goods and services, relies on devices like computers, tablets and smartphones for online transactions. Essential infrastructure services, such as e-commerce platforms and online payment systems, further support this ecosystem. The mutual relationship between the trade in these goods and services and the development of digital trade is evident. For example, an increase in digital trade can spur companies to adopt advanced digital technologies, boosting the demand for services like cloud computing and cybersecurity. Therefore, to effectively enhance digital trade, comprehensive frameworks addressing both the goods and services aspects of digital trade enablers are crucial.

*“Digital trade and investment enhance sustainable development, primarily driven by digitally deliverable services related to data, online transactions and platforms.”*

This report examines the contribution of digital trade to sustainable development, focusing on three primary pillars – economic growth, social inclusion and environmental sustainability. At the heart of this mechanism is the digital deliverable services, with particular emphasis on the services related to data, online transactions and digital platforms. Such elements shape the utilization of digital technologies, especially the Internet, offering expanded outreach, reduced trade costs, enhanced efficiency, and seamless information search and distribution. Key pathways through which digital trade channels developing economies towards the attainment of Sustainable Development Goals (SDGs) include:

- **Expansion of trade and access to markets through digital platforms:** Arguably, the most direct way digital trade fosters economic opportunities is its role in offering to individuals and small businesses, especially those under-represented, online platforms to participate in international trade opportunities. For example, Micro, Small-, and Medium-Enterprises (MSMEs) can leverage digital platforms like eBay, Amazon, or Alibaba to market their products to a global audience.
- **Cost-effective access to information:** Digital trade significantly streamlines and increases access to pivotal information and knowledge. Leveraging data services and digital platforms, barriers in obtaining information about foreign markets and their respective regulations are substantially reduced. This facilitates domestic and international competitiveness by reducing trade costs (López González and Sorescu, 2021).
- **Digital services as inputs:** In addition to cross-border services supply (mode 1), digitally deliverable services are becoming important inputs for goods exports. Specifically, digital services are vital for implementing Industry 4.0 technologies, driving value addition in SMART manufacturing products (UNIDO, 2019). Even in primary sectors like mining and agriculture, data services are becoming indispensable, equipping businesses with the means to improve productivity, reduce wastage, mitigate risks and offer enhanced solutions to their clients. The

nature of international production networks with increasing reliance on digital services as inputs inherently imply that digital services are bundled with goods and traded along GVCs.

- **Provision of essential services:** Several services can be procured and utilized online. This is especially applicable to sectors like IT, professional services, finance, retail and education (Broadbent and others, 2014). New services, like cloud computing, that have become indispensable business inputs are also included (World Bank, 2016).

Through these channels, the potential role of digital trade in realizing the SDGs becomes apparent. However, while digital trade presents opportunities, it also poses unique challenges. The following sections in this report are dedicated to discussing these dual aspects of digital trade’s impact. The next section delves into the myriad opportunities presented by digital trade, segmented by the three SDG pillars. The section thereafter addresses the distinct challenges.

## 2. OPPORTUNITIES

### 2.1 Economic growth

*“Digital platforms and other digitally-delivered services reduce the costs for sellers venturing into new markets, improve market functioning, productivity of firms and workers, and support the creation of innovation.”*

Digital platforms enhance market accessibility and reduce information gaps, thus boosting growth in traditional sectors such as agriculture. By making productivity-enhancing services available, digital trade increases productivity and streamlines market efficiency. Through promoting digital adoption, the realization of Industry 4.0 becomes attainable across various sectors and firms of all sizes.

Specifically, digital platforms reduce the costs for sellers venturing into new **markets** or reaching international customers or suppliers. Search engines, e-marketplaces, and web-based information services reduce market frictions and information asymmetries, **improving market functioning** in traditional areas such as agriculture and commodity markets. In addition, digital trade provides access to cheaper or

higher-quality digital inputs that can help **improve productivity** (World Bank, 2016). Examples of these productivity-enhancing digital services are back-end software, online information services and data analytics. The flow of information and data via software, digital content and any number of other Internet-based services, arguably influence both the productivity and **innovation** levels (Ezell and Koester, 2023).

In terms of labour markets, digital trade can reduce frictions in the job market by lowering search and information costs. Digital trade can also promote high-paid jobs by supporting the adoption of technologies such as computerization as well as automation that improve labour productivity. Moreover, digital trade can generate new jobs indirectly, particularly self-employment jobs such as e-commerce entrepreneurship and freelancers that remotely provide the supply of professional services (ILO, 2021).<sup>5</sup>

Digital trade also plays a pivotal role in fostering the adoption and application of **Industry 4.0 technologies**. It enables producer of these technologies to have greater access to essential inputs such as data, information and knowledge (box 1.1).<sup>6</sup> Through digital trade, the manufacturing sectors have increasingly transformed into what is now known as ‘SMART manufacturing’. The concept emphasizes the increasing integration and complementarity between physical goods and digital services (Lim, 2021). At the same, it could lead to a shift towards more digital and localized supply chains (WTO and others, 2019). According to Broadbent and others (2014), industries that predominantly rely on digital solutions include content production, communications, finance and insurance, retail, health care, education and manufacturing. An example is Xerox. Traditionally known for its printers, Xerox has repositioned itself as a document solutions enterprise, integrating digital document design services.



### Digital trade as an enabler of Industry 4.0

Industry 4.0 is a comprehensive concept that originated in a high-tech strategy developed by the Government of Germany in 2011. According to Germany’s Federal Ministry of Education and Research (2016), the concept of Industry 4.0 emerged from a trend in manufacturing characterized by the integration of technologies that enable ecosystems of intelligent, autonomous and decentralized factories as well as integrated product and services. In this context, Industry 4.0 frames a set of technologies that link production to quality services through processes of smart collection and application of real time data and information (UNIDO, 2019a).

Digital trade plays a role in harnessing the development and adoption of Industry 4.0 technologies by enabling producers of these technologies to have more access to essential inputs such as data, software, information, and knowledge. In this way, digital trade and Industry 4.0 technologies are mutually reinforcing. According to the World Economic Forum (WEF), 2020, the top five technologies that firms are using to undertake international trade transactions are: Internet of Things; digital payments; e-commerce platforms; cloud computing; and 5G. Other technologies mentioned by firms include: artificial intelligence and machine learning; digital documents, signature and identities; smart border systems; distributed ledger technologies; robotics and automation; open supply chain information systems; virtual reality; and additive manufacturing.

<sup>5</sup> Concerns exist about automation and AI, leading to labour displacement. However, it is important to distinguish between the impacts from digital trade and the impacts from these specific technologies. Digital trade facilitates the adoption of a diverse array of digital solutions, many of which augment rather than replace human expertise. Business processing software applications, for example, streamline administrative tasks, allowing employees to focus on more strategic activities.

<sup>6</sup> Industry 4.0 technologies is a set of technologies that link production to quality services through processes of smart collection and application of real-time data and information (UNIDO, 2019a).

## 2.2 Inclusivity

*“By expanding market opportunities and reducing trade costs for small businesses led by marginalized groups, digital trade is a driver for more inclusive trade.”*

Digital trade, by expanding market opportunities and reducing trade costs for **small businesses** is a driver for more inclusive trade. E-marketplaces negate the

need for MSMEs’ physical presence abroad, amplifying their visibility to potential partners and customers (box 1.2). Equally essential is facilitating MSMEs’ access to online advertising, cloud computing and insights into foreign markets. Additional platform features, such as customer reviews and online payment systems, bolster buyer and investor trust. Consequently, these platforms expand trade opportunities for MSMEs and reduce their transaction costs.



### Digitally ordered trade (cross-border e-commerce) and inclusive development

E-commerce platforms such as Shopee, Lazada and Taobao that have international presence allow easier participation by a wider range of stakeholders – SMEs, women, other vulnerable and disadvantaged groups – in international trade. For example, “Taobao” villages saw one-third of online stores were operated by females, and one-fifth were run by previously unemployed individuals (World Bank, 2016). In 2020, despite the detrimental effects of the COVID-19 pandemic, 2.96 million Taobao online stores engaged in domestic and global trade (AliResearch, 2020).

Moreover, e-commerce platforms globalize local products and aid in closing the digital, skill and gendered divide in entrepreneurship. For example, Lazada’s collaboration with the Ministry of Domestic Trade and Consumer Affairs in Malaysia provides training to increase adoption of e-commerce and supports the government’s “Buy Malaysian” campaign (Adilla, 2022). Similarly, initiatives like “Shopee University” support sellers in starting their online business and upskill digital skills (Seller Education Hub, n.d.). The Shopee University initiative offers “Seller Master Classes” aimed at educating sellers on various strategies for business expansion, increasing sales and exposure, boosting web traffic, and optimizing operational performance.

*“Digital trade can play role in enhanced opportunities of marginalized groups in accessing to jobs, markets and essential services.”*

Similarly, digital trade is recognized for its crucial role in lowering market and job entry barriers for **marginalized groups**, such as women. Studies show that, in the Asia-Pacific region, women have significantly become more engaged in online businesses compared to traditional industries. For example, on the e-commerce platform Lazada, a third of sellers in Indonesia are women entrepreneurs, and on its Philippine counterpart, this figure rises to two-thirds (IFC, 2021). Furthermore, more than half of the online stores on China’s popular e-commerce platform, Taobao, are run by women (AliResearch, 2017). These women-led firms are often micro-enterprises (UN Women, 2023).

Moreover, digital trade, facilitated by platform services, has introduced **new job avenues**, particularly benefiting women due to the geographical and temporal flexibility they provide. For example, ILO (2021) identifies three primary categories of digital platform services influencing women’s empowerment: 1. Location-based service and delivery platforms that often cater to low-skilled workers, including those in home and care services; 2. Online web-based platforms that allocate tasks remotely, primarily creating opportunities for skilled workers, such as freelancers; 3. Social- and e-commerce platforms where many sellers are women, as noted earlier. Specifically, these women-led businesses frequently utilize social media platforms as an initial step to expand their customer reach (Suominen, 2021).



Digital trade potentially improve **access to essential services**, especially in areas like health care, education, and finance (box 1.3). With regard to health care, digital trade equips developing countries with essential digital technologies such as telemedicine platforms, electronic health records and remote diagnostic tools vital for enhancing e-health services. Moreover, by engaging in cross-border digital health services, countries can tap into a broader spectrum of expertise, access advanced medical algorithms, and offer patients a wider range of specialists, thus expanding the health-care potential benefits even further. For example, the Philippines and India have seen growing export opportunities from health-care outsourcing practices medical transcription and data conversion (Chanda, 2017; Hanefield and others, 2018).

In education services, studies show that e-learning can significantly lower costs, potentially by up to

50%, due to time, travel, labour savings, reduced infrastructure needs and the integration of new educational technologies (Gibbons and Fairweather, 2000). According to Coursera (2021), the Asia-Pacific region had the highest student enrolment, with 28 million new learners registering for 68 million courses. India was responsible for half of these enrolments, while the Philippines, Indonesia and Viet Nam exhibited prominent growth.

In the financial domain, digital services, particularly e-payment systems and digital finance solutions, have reduced transaction costs for both individuals and MSMEs. For example, the cost of sending remittances is halved when facilitated through digital means (World Bank, 2020). Similarly, insurance entities utilize digital methods to decrease insurance premiums and boost accessibility, both for individuals and MSMEs.



### E-health, online-learning, digital finance

Facing population ageing, increasing health-care demand, and subpar doctor-patient ratios, the Asia-Pacific region can leverage e-health tools to achieve various Sustainable Development Goals (SDGs) (*The Economist*, 2021). E-health uses digital technologies like the Internet, AI, smart devices, and big data to improve health services and outcomes (WHO, 2021), a trend accelerated by the COVID-19 pandemic. However, cross-border trade in E-health services faces constraints due to service trade restrictions, domestic regulations and data-related policies (see chapter 4 for further discussion). Thus, overcoming these regulatory challenges could broaden health-care access for geographically and socially marginalized communities.

Online learning relies on information and communication technologies to facilitate wider access to educational resources (Arkorful and Abaidoo, 2015). The primary advantages of e-learning include flexibility in learning pace and choice of environment. However, studies also show that a necessary condition for benefiting from e-learning opportunities is having proper ICT devices, and reliable Internet network (Coleman, 2021; Schultz and Robinson, 2022).

Digital finance has proven essential for enhancing MSMEs' financial access, particularly in times of crisis (IFC, 2020). By leveraging AI and ML, fintech tools simplify loan processes and ensure quicker, more accurate credit assessments. Such innovations not only increase efficiency and reduce costs but also tailor and expand services to MSMEs (United Nations, 2020). Digital payment services are among the many offerings within digital financial services. Since the COVID-19 pandemic, cash transactions in the Asia-Pacific region have sharply declined, with a corresponding rise in digital payments (Agur and others, 2020).

## 2.3 Environmental sustainability

*“Digital trade potentially reduces environmental impact by decreasing transportation needs, promotes resource efficiency, facilitate environmental surveillance, and development of a circular economy.”*

Digital trade emerges as a conduit for innovative environmental solutions. It grants enhanced access to IoT solutions and data analytics, essential for the development and implementation of **resource-efficient technologies** (UNIDO, 2019). Advanced software, cloud services and visualization tools made available through digital trade play a pivotal role in **monitoring environmental metrics**, such as carbon pricing evaluations, and the use of satellite technologies for tracking climate impacts like deforestation, air pollution and oceanic temperature shifts.

A shift to **digital procedures** like e-signatures, e-contracts and e-communications not only streamlines cross-border transactions but also results in substantial resource conservation. This transition from traditional paper methods to digital ones not only reduces costs and saves time but also supports sustainability objectives, leaving a smaller environmental footprint (box 1.4) (López González and Sorescu, 2022).

Furthermore, the digital realm contributes to the growth of platforms that bolster **the circular economy**, emphasizing renewable energy credits, trading of second-hand goods, and eco-centric products and services. Moreover, it fosters a leaner supply chain, allowing businesses to more accurately meet demand without the necessity of large inventories, leading to less waste (Kraemer and others, 2006).



### Complexities in non-paperless trade procedures

In 2014, Maersk discovered that transporting refrigerated goods from East Africa to Europe involved almost 30 different parties, encompassing more than 200 distinct communications and interactions among them. Surprisingly, the time and costs attributed to waiting for paper stamps and email responses rivalled the expense of the shipment itself (Maersk, 2014). Similarly, when examining trade finance, a Boston Consulting Group study revealed that a single trade finance transaction can engage more than 20 stakeholders. These stakeholders interact with data from a myriad of documents – typically between 10 to 20 documents, accumulating to more than 100 pages. This results in roughly 5,000 data field interactions throughout the transaction (BCG, 2017).

## 3. CHALLENGES

### 3.1 Infrastructure divide and high cost of access

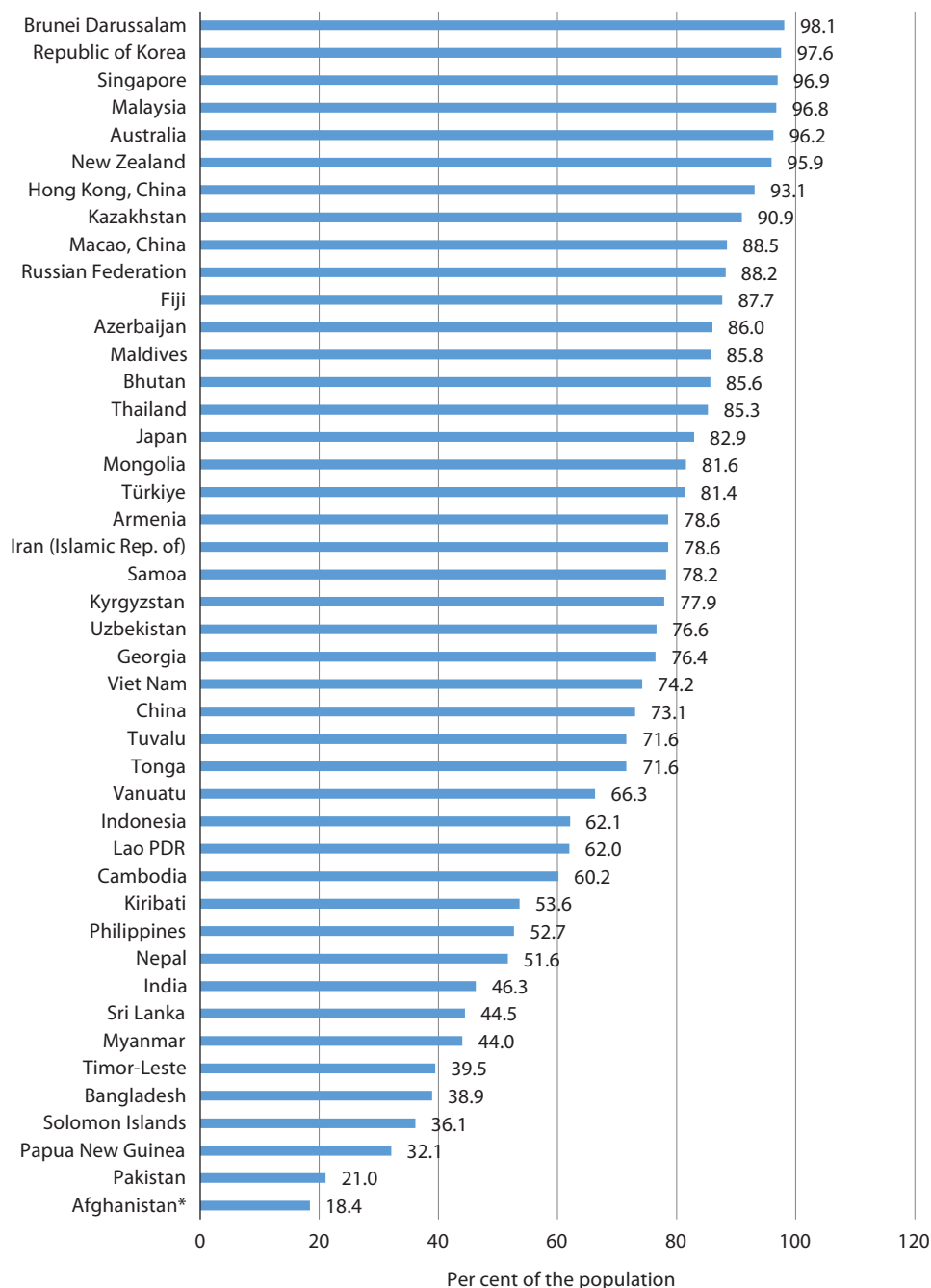
To capitalize on the opportunities presented by digital trade, individuals and businesses need online access. This depends on the availability and affordability of connectivity infrastructure and essential digital devices. Equally vital are the skills to effectively navigate the digital platforms and an awareness of digital trade opportunities.

*“The digital divide could further intensify existing inequalities across and within countries and different societal groups.”*

However, the reality paints a contrasting picture. As of 2022, a staggering 2.7 billion people globally were still offline, with the majority residing in the remote and underserved locations of developing countries. Based on ITU’s data, in the Least Developed Countries (LDCs), only one out of every five individuals use the Internet. In the Asia-Pacific context, the disparity in Internet usage between high and low-income countries is strikingly evident. In 2021, on average, 64% of the Asia-Pacific population has Internet access. High-income countries such as Brunei Darussalam, the Republic of Korea and Singapore had more than 90% of individuals with Internet use. In contrast, lower-income countries such as Pakistan and Afghanistan only about 20% of the population using the Internet during the same period (figure 1.2).



**Share of the population using the Internet from any location via a fixed or mobile network, 2021**

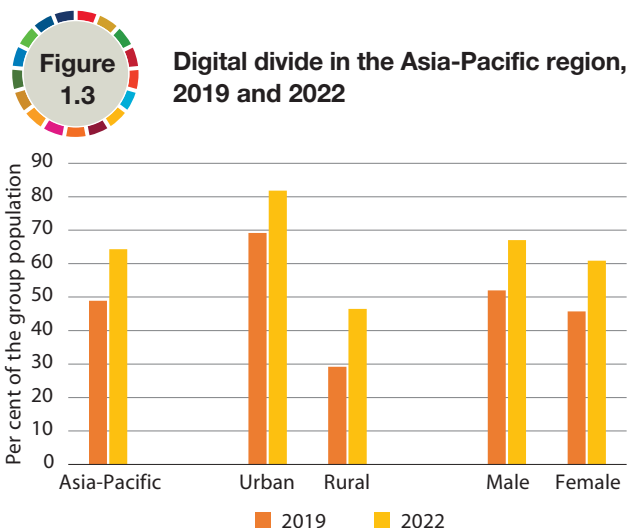


Source: ESCAP, based on ITU data hub (<https://datahub.itu.int/query/>).

Note: Afghanistan's figures are as of 2020.

The within-country disparities also exist. For example, urban Internet penetration in the Asia Pacific region reached 82% in 2022. In contrast, the rural online rate was just 47% (figure 1.3). In addition, 68% of men in the region were using the Internet in 2022, as opposed to 61% of women (ITU, 2022). If these disparities remain unaddressed, the digital divide could further intensify existing inequalities across and within countries and different societal groups (UNIDO, 2019).

*“Policy barriers like state monopolies, tariffs, and stringent business regulations likely elevate Internet and device costs, further obstructing digital adoption and trade.”*



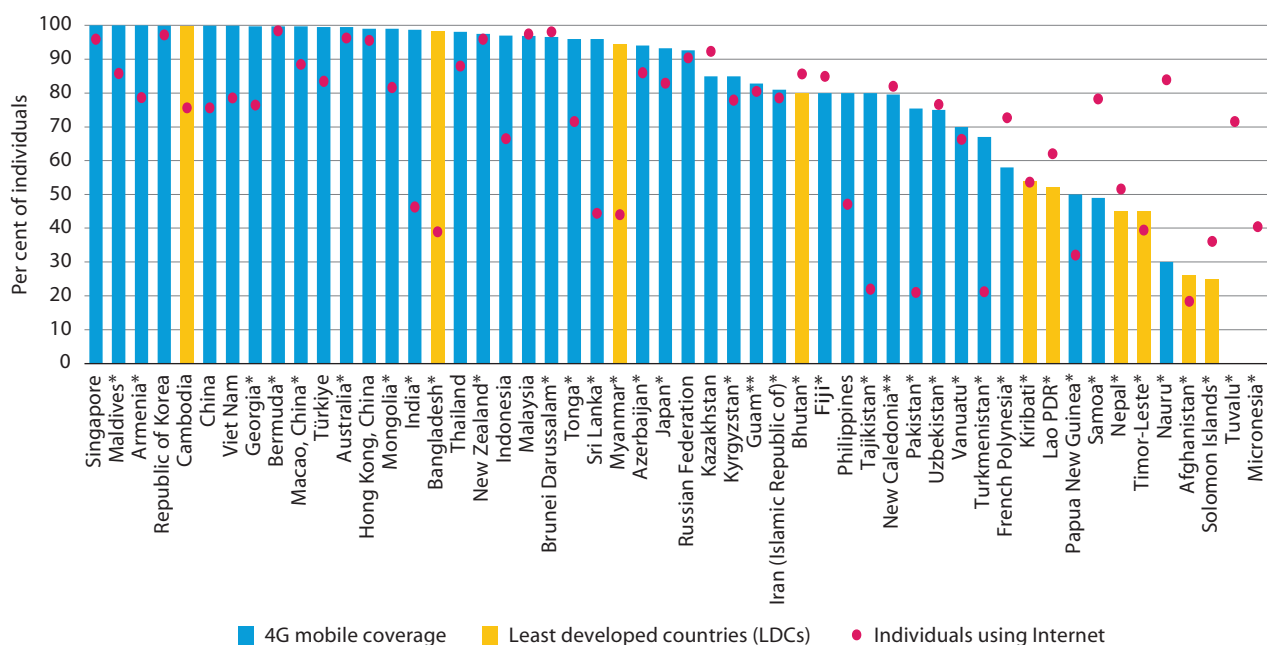
Source: ESCAP, based on ITU data hub (<https://datahub.itu.int/>).

Note: The data refer to the proportion of individuals who used the Internet from any location in the last three months. Access can be via a fixed or mobile network.

Despite extensive 4G coverage in some of these economies, less than half the population uses the Internet, especially in South- and South-West Asia (SSWA), the Pacific Islands Developing Economies (PIDEs), Land Locked-Developing Countries (LLDCs), and certain South-East Asian (SEA) economies (figure 1.4). According to Alliance for Affordable

Internet (2020), policy barriers such as State monopolies, tariffs and stringent business regulations likely elevate Internet and device costs, further obstructing digital adoption and trade.

**Figure 1.4** 4G mobile coverage and Internet use, Asia-Pacific economies, 2022



Source: UNCTAD, based on ITU data hub (<https://datahub.itu.int/>).

Note: \*\*4G mobile coverage 2019, Internet use 2017. 4G mobile coverage refers to LTE/WiMAX networks. Micronesia (Fed. States of) and Tuvalu reported zero 4G coverage.

*“Key challenges also include a deficient legal and regulatory framework, issues in ensuring trustworthy and streamlined digital trade transactions, complex trade logistics, and problems with e-payments.”*

Specifically, despite widespread Internet access in countries such as Azerbaijan, Bhutan and the Islamic Republic of Iran, only a modest portion engages in online buying; 4%, 13% and 19%, respectively (ITU, 2022). This disparity underscores that factors other than ICT connectivity hinder the full realization of digital trade. Key challenges include a deficient legal and regulatory framework, issues in ensuring trustworthy and streamlined digital trade transactions, complex trade logistics and problems with e-commerce payments (UNCTAD, 2022).

### 3.2 Challenges for MSMEs and marginalized groups

*“Within the MSME sector, a considerable disparity exists in digital skills and knowledge.”*

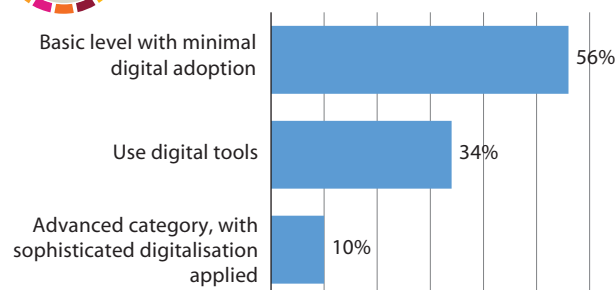
Among MSMEs, there is a significant gap in digital skills and awareness. For example, in rapidly growing South-East Asian countries like Singapore, Thailand, Malaysia and Viet Nam, only about a third of MSMEs engage in e-commerce (ERIA, 2019). Data indicate that 56% of MSMEs have basic digital interaction, such as using emails, while a mere 10% utilize advanced digital tools (figure 1.5). In addition, 87% of ASEAN MSMEs typically avoid seeking online information, often presented in English. According to UNCTAD (2021), during the COVID-19 crisis, many MSMEs and consumers, especially in developing countries, were not digitally equipped to capitalize on e-commerce.

*“The gender disparity in digital economy is evident in the Asia-Pacific region.”*

In the Asia-Pacific region, the **gender disparity** is noticeable. For example, for every five men with coding abilities, only three women possess the same skills across selected countries. Notably, in most Asia-Pacific economies, less than 2% of women have coding skills, with the exceptions being Malaysia, Singapore, the Republic of Korea and Macao; China If possible, please have (figure 1.6) appearing before



**Digitalisation of SMEs in ASEAN**



Source: UNIDO, adapted from ERIA (2019) “Study on MSMEs Participation in the Digital Economy in ASEAN” (<https://asean.org/book/study-on-msmes-participation-in-the-digital-economy-in-asean/>).

the actual figure. The World Bank (2022) emphasizes that female entrepreneurs in South-East Asia often lag in education compared with male counterparts. The digital divide is further highlighted in digital transactions, with countries like Bangladesh seeing a 14% gap favouring men in digital payments (GPFI and World Bank, 2021), a trend mirrored across South Asia (Sioson and Kim, 2019). Worryingly, even in e-commerce, female vendors typically earn 20% less than male sellers for identical products (Sicat and others, 2020).

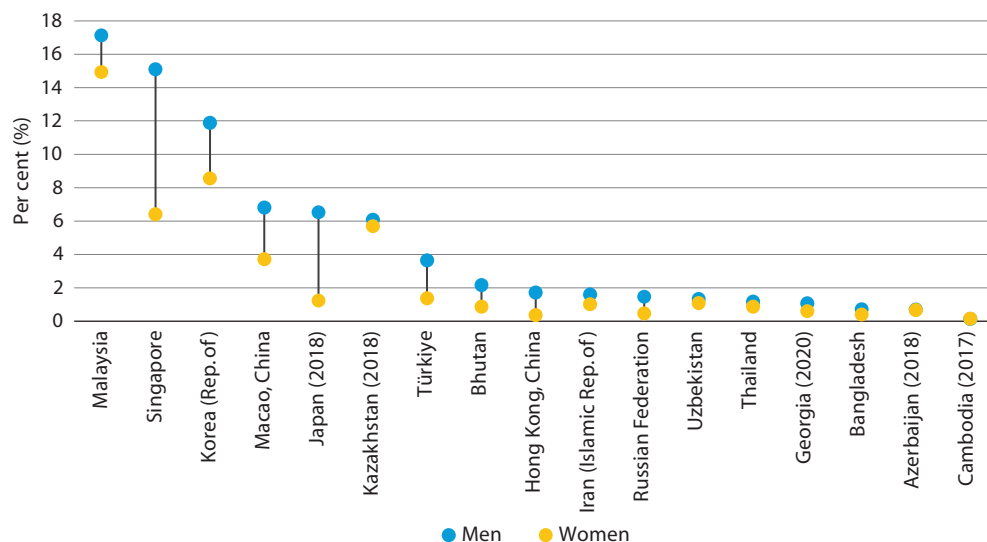
### 3.3 Environmental challenges

*“E-commerce involving physical products necessitates packaging, shipping, and transportation”.*

Digital trade, while beneficial for environmental sustainability, also poses challenges. A significant concern is the growth in parcel trade, often less efficient than bulk purchases (OECD, 2019). E-commerce that involves physically delivered products requires packaging, shipping and transportation. These steps can negatively impact the environment due to increased packaging waste and transportation emissions (Muñoz-Villamizar and others, 2021). In addition, Baker and Le (forthcoming) underscore a pronounced correlation between the e-commerce index and CO<sub>2</sub> emissions (figure 1.7). This aligns with studies indicating that significant electricity consumption by data centers and electronic devices involved in digital transactions contributes to larger carbon footprints (Dost and Maier 2018; Kim et al. 2019; Renugadevi et al., 2020).

**Figure 1.6**

### Shares of men and women with programming skills\* in selected Asia-Pacific economies, 2021

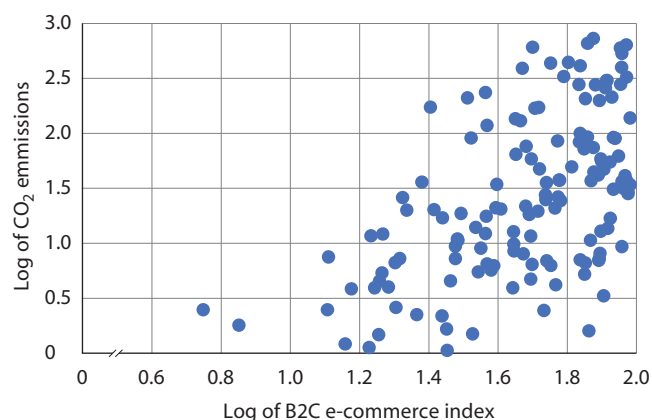


Source: UNCTAD, based on ITU datahub (<https://datahub.itu.int/>).

Note: \*These skill sets refer to the abilities of individuals to write a computer program using a specialized programming language.

**Figure 1.7**

### B2C e-commerce index and CO<sub>2</sub> emissions, 2020



Source: Baker and Le (forthcoming).

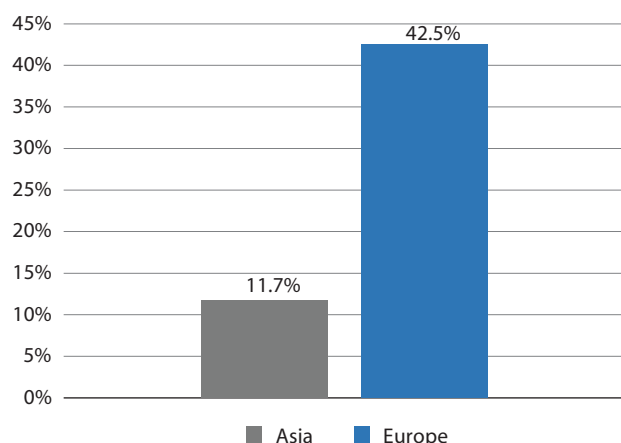
*“The disposal of electronic devices, essential to digital trade, presents environmental challenges.”*

Moreover, the disposal of electronic devices, which are essential to digital trade, presents challenges related to regarding e-waste. As per the United Nations Global E-waste Monitor, approximately 53.6 million tonnes of e-waste were generated globally in 2019. This figure is projected to increase to 75 million tonnes by 2030 and approach 110 million tonnes by 2050 (Parajuly and others, 2019). Alarming, the Asia-Pacific region displays a low e-waste recycling rate and falls short in e-waste recycling facilities compared to developed regions like Europe (figure 1.8). For many developing countries, setting up such facilities locally may not be economically feasible.





**E-waste recycling rates: Asia vs. Europe, 2020**



Source: ESCAP, adapted from Forti and others (2020) “The Global E-waste Monitor 2020” ([https://ewastemonitor.info/wp-content/uploads/2020/11/GEM\\_2020\\_def\\_july1\\_low.pdf](https://ewastemonitor.info/wp-content/uploads/2020/11/GEM_2020_def_july1_low.pdf)).

Note: Statistics in the Global E-waste Monitor report adheres to the guidelines outlined in the “E-waste Statistics Guidelines on Classification, Reporting, and Indicators – Second Edition.” This categorization aligns with the Electrical and Electronic Equipment (EEE) directive, which has been adopted by European member states. For the data of European economies, information was sourced from the Eurostat database. For other economies, data collection relied on questionnaires conducted by SCYCLE, OECD, and UNSD.

### 3.4 Challenges for “Partnership for the Goal”

*“Conflicts between countries in digital trade policies and mistrust towards platform companies may hinder the SDG 17.”*

Tensions resulting from conflicts in digital trade policies across economies and mistrust towards platform companies, could potentially jeopardize the achievement of SDG 17. Some of the notable challenges include:

- **Non-tariff barriers:** While regulatory measures in the digital trade sector often stem from public policy goals, there is growing apprehension about concealed protectionist motives. Specifically, concerns arise from regulations

potentially restricting cross-border data flow, mandatory trade secret disclosures, and those disproportionately increasing operational costs for foreign businesses (chapter 3 discusses the measures in detail);

- **Platform monopolies:** Dominant market power of large tech companies creates concerns about potential anti-competitive practices. For example, in the absence of a robust competition policy, e-marketplace companies may be inclined to favour their own products or services, or harness their vast data repositories to outcompete other sellers;
- **Digital taxation issues:** The challenge lies in appropriately taxing digital businesses. Unilateral tax measures adopted to address this issue can lead to broader trade and economic tensions. Concerns regarding opportunity costs, tax evasion and perceived favouritism towards online businesses underscore that lenient digital trade tax exemptions, like the De Minimis Rule and the Moratorium on Customs Duties on Electronic Transmissions, are currently facing increased scrutiny (refer to chapter 4 for further details).

## 4. DIGITAL TRADE AND DEVELOPMENT OUTCOME: EVIDENCE

*“Empirical evidence indicates that the growth in digital trade generally presents promising prospects for sustainable development in the Asia-Pacific region.”*

Regarding the evidence, studies reveal that the rise in digital trade has positive prospects for the economy. Several studies indicate that increased digital trade contributes to productivity, economic growth, and export performance (Baker and Le, forthcoming; François and Hoekman, 2010; Hoekman and Mattoo, 2008). It is important to note the two-way relationship between digital trade and total exports. Goods exports can stimulate demand for digital services, particularly knowledge-intensive services crucial for manufacturing production.<sup>7</sup>

<sup>7</sup> Hoekman, B. and Mattoo, A., 2008, Services Trade and Growth (Policy Research Working Paper No. 4461, World Bank, Washington, DC; François, J., and Hoekman, B., 2010, Services trade and policy, *Journal of Economic Literature*, 48(3), pp. 642-692; Eichengreen, B. and Gupta, P., 2013a, Exports of services: Indian experience in perspective, *Indian Growth and Development Review*, 6(1), 35-60. Sahoo, P. and Dash, R. K., 2017, What drives India's surge in service exports? *The World Economy*, 40(2), pp. 439-461.



In searching for evidence of digital trade's relationship with the achievement of SDGs, ESCAP employed Fixed-Effect regression models.<sup>8</sup> In these models, multiple digital trade variables (DTVs), digital provision variables (DPVs) and controls were regressed on an array of SDG targets (see Annex). These targets are spread across the 17 SDGs, which are grouped into four clusters: economic (SDGs 1, 2, 8 and 9), environmental (SDGs 6, 7, 11, 12, 13, 14 and 15), social (SDGs 3, 4, 5 and 10) and governance and partnership (SDGs 16 and 17).<sup>9</sup> A summary of main findings can be found below (figure 1.9).

*“ESCAP observed that a 1% increase in digital trade value is associated with a 0.8 percentage point rise in the growth rate of real GDP per capita.”*

Overall, the ESCAP study supports the notion that digital trade positively impacts the SDGs. A rise in digital trade was found to be positively linked with progress in 80% of the significant relationships observed. Furthermore, a 1% increase in digital trade value is associated with a 0.8 percentage point rise in the growth rate of an economy's real GDP per capita. This result is broadly consistent with Baker and Le (2023), suggesting a 1% increase in digital service trade value corresponds to approximately 3% improvement in a country's GDP per capita.

*“Generalized positive impacts of digital trade on social outcome (SDGs 3,4,5 and 10).”*

Among all areas of intervention, social targets – covering SDGs 3 (good health and well-being), SDG 4 (quality education), SDG 5 (gender equality) and SDG 10 (reduced inequality) – recorded the most consistent and positive results. Indeed, all six targets measured revealed generalized positive impacts of digital trade on social outcome (SDGs 3, 4, 5 and 10).

More specifically, higher digital trade was found to be linked with an average improvement in health and well-being (SDG 3), proxied via the target on the mortality rate from various diseases.<sup>10</sup> In particular, trade in digital services and trade in ICT goods are found to be the most relevant factor for this area of development. These results are in line with Zhang and others (2022), who presented evidence that an increase in digitally delivered health-care services reduced the mortality rate and increased life expectancy in China. Moreover, this finding bolsters the optimism surrounding many ongoing digital health initiatives that aim to enhance health outcomes with digital technologies (WHO, 2021).

Nevertheless, this positive impact is primarily evident in countries with substantial Internet penetration, generally above 50% of the population. Understandably, transitioning from physically delivered to digitally provided health-care services is contingent on a robust and widespread ICT network. Moreover, the benefits intensify as Internet penetration grows. The results suggest that fostering digital trade can also indirectly bolster health-care outcomes through its impact on the development of enhanced connectivity infrastructure.

A significant positive relationship also exists between increased digital trade and improved educational outcomes (SDG 4). Specifically, a surge in digital services trade correlates with rising education rates. These findings suggest a possible synergy between e-learning and formal education achievement. However, the model suggests that as digital trade per capita rises, its beneficial impact on formal education diminishes with increasing Internet penetration, especially in countries where the rate exceeds 43%.

One possible reason is that as a greater proportion of the population comes online, those who remain offline might belong to segments that are harder and costlier to connect, whether to online or to formal

<sup>8</sup> Please see Anukoonwattaka, Romeo, and Shahu (forthcoming) for details.

<sup>9</sup> This regression model can generally be described as:

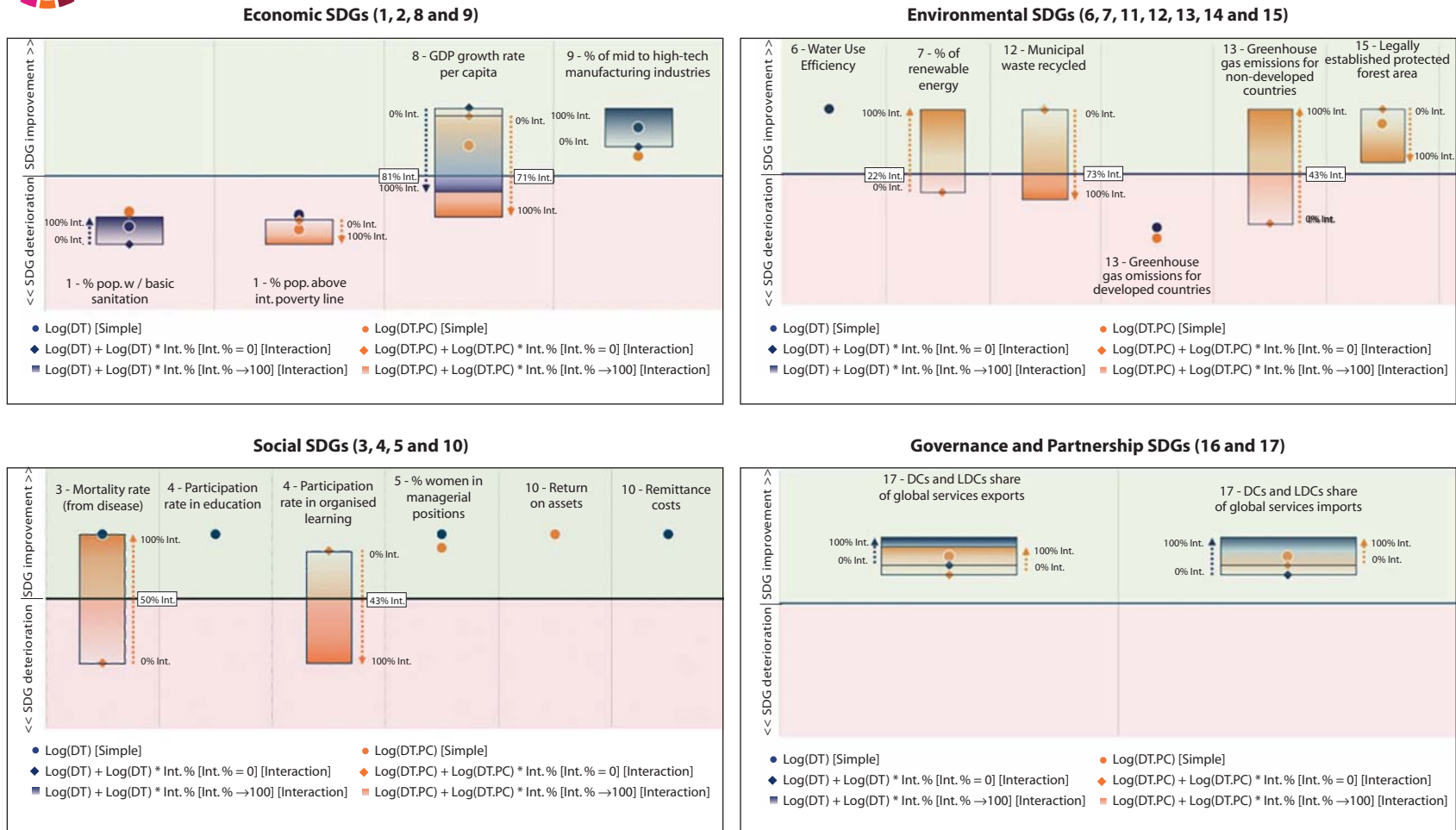
$$SDG_i^y = \beta_0 + \beta_1 DTV_i^y + \beta_2 DPV_i^y + \beta' A_i^y + \beta'' FE_i \quad (1)$$

Where  $A'$  represents a vector of controls comprising  $Log(GD)$  and  $Int.\%$ , with 'Int %' translating the share of households with Internet access.  $\beta'$  represents the corresponding vector of coefficients.  $EF'$  represents the vector of country fixed-effect dummies and  $\beta''$  the corresponding vector of coefficients.  $DT.CH_i$ , standing for the count of chapters in international trade agreements with digital provisions, was the selected DPV across all specifications. Two DTVs —  $Log(DT)$  and  $Log(DT.pc)$ , where 'DT' is short for Digital Trade and 'pc' for per capita — were selected and regressed separately. Finally, additional specifications interacting each DTV with were run to assess the changing impact of DT across levels of digitalization. Refer to the background paper (forthcoming) for additional information.

<sup>10</sup> Cardiovascular disease, cancer, diabetes or chronic respiratory diseases.



**Figure 1.9** Normalized estimated impacts of digital trade on SDG targets – by area of intervention



Source: ESCAP.

Note: The graphs present normalized coefficients for each digital trade variable – Digital trade (DT), Digital trade per capita (DT.PC) – across two model specifications. The two models are a simple model (no interacted variables) [Simple] and an interaction model [Interaction]. For [Interaction] models, a diamond represents the direct digital trade variable coefficient (i.e., Int. % = 0); gradient bars represent the total (from both the direct and interacted coefficients) digital trade impact for each level of Internet penetration between zero and 100%. On the X-axis next to crossing gradient bars, the precise Internet penetration level at which the total average digital trade impact switches sign is displayed.

education. Notably, this group may include residents of remote areas, the elderly and those experiencing economic disadvantage (Coleman, 2021; Schulz and Robinson, 2022). This hypothesis underscores the importance of complementing digital trade policies with efforts to ease connectivity barriers and provide educational incentives specifically tailored for disadvantaged groups.

Higher digital trade appears to positively influence the reduction of inequalities. Notably, the percentage of women in managerial roles, a target of SDG 5, along with the return on assets and remittance costs, benchmarks of SDG 10, all show robust positive correlations with increases in digital trade. Such outcomes align with the notion that digital trade can empower marginalized groups by fostering financial inclusion and enhancing efficiency. Examples include cross-border online money transfers, which directly reduce remittance costs, and the expansion of online and remote work opportunities, enhancing workforce participation. Furthermore, digitally delivered services, such as social media, web, and other information services, have the potential to open avenues for enhancing social awareness and fostering corporate responsibility towards greater inclusivity.

*“Digital trade demonstrates promising connections progress toward environment-related SDGs (SDGs 6, 12 and 15).”*

Except for some concerns linking digital trade to climate action (SDG 13) in developed countries, and ambiguity regarding its impact on sustainable cities (SDG 11) and life below water (SDG 14), digital trade generally encouraging links with progress toward environment-related SDGs (SDGs 6, 12 and 15). The result is consistent with the notion that digital trade can unlock transformative technologies that are essential for addressing environmental challenges.<sup>11</sup> Specifically, there is a positive correlation between digital trade and enhanced water use efficiency (SDG 6), recycling of municipal waste (SDG 12), and expanded protected forest areas (SDG 15). In regions

with more than 20% Internet connectivity, there is a rise in renewable energy use (SDG 7) due to digital trade. In addition, in developing countries with above 45% Internet connectivity, a decrease in carbon emissions (SDG 13) is observed.

*“A positive linkage between higher digital trade and an improvement in SDG 17 targets was found.”*

Evidence pertaining to a positive linkage between higher digital trade and an improvement in SDG 17 targets was found. Indeed, the increase in digital trade is associated with expanded opportunities for services trade in developing countries (DCs) and least developed countries (LDCs). Notably, this impact only grows stronger as Internet penetration rises.

To contextualize the impact of digital trade on DCs and LDCs, it is important to recognize that the impact can manifest through both direct and indirect channels. Direct channels encompass opportunities arising from utilizing platforms such as e-commerce websites, and other digitally delivered services. Indirectly, digital trade can empower DCs and LDCs to engage in trade-enabling initiatives and bolster their participation in global value chains (GVCs). Concrete examples of trade-enabling initiatives are such as the United Nations' Automated System for Customs Data (ASYCUDA), Thailand's Customs Connect, and USAID's Nextrade. In addition, the emergence of regional digital trade-related initiatives and the rollout of e-government solutions highlight the increasing involvement of DCs and LDCs in partnerships and governance programmes.

*“Evidence associates digital trade with advancements in economic growth and innovation (SDGs 8 and 9).”*

The impact of digital trade on economic SDGs yields mixed findings. While substantial evidence associates digital trade with advancements in economic growth and innovation (SDGs 8 and 9), it does not necessarily correlate with reduced hunger. Moreover, it might even intensify poverty.

<sup>11</sup> For example, digital trade is instrumental to initiatives such as PlantSight and SIWA, which focus on efficient water and waste management. Similarly, in India, CoolCrop aids in optimizing crop cold storage, while DBS has pioneered solutions for product provenance tracking. Moreover, a myriad of projects, from monitoring flood risks to tracking agricultural yields with platforms like WaPOR, observing overfishing patterns, wildlife migration or the supply and distribution of renewable energies, all hinge on robust digital products and infrastructure. Such energetic engagement in digital trade is paramount to the success of these initiatives (Wilts and others, 2021; WWF, 2022; Jozefowicz and Michniewicz-Ankiersztajn, 2023).

Regarding SDG 8, evidence strongly suggests that digital trade propels economic growth. As mentioned earlier, ESCAP found that a 1% increase in digital trade value is associated with a 0.8 percentage point rise in the growth rate of an economy's real GDP per capita.

In relation to SDG 9, the increase in digital trade corresponds with a significant rise in the proportion of tech industries within economies. As Internet access expands, the benefits of digital trade become even more evident. This generally aligns with the notion that the digital technologies introduced by this trade significantly enhance productivity, especially in medium-to-high tech sectors.

However, the results regarding the impact of digital trade on other economic SDGs are mixed. Despite its potential to spur economic growth, the empirical investigation demonstrates that digital trade may inadvertently increase the number of individuals living in poverty (SDG 1) and plays only a marginal role in reducing hunger (SDG 2). This could stem from digitally disadvantaged groups facing challenges in an ever-changing economic landscape, like job losses. This effect is particularly evident in labour-intensive sectors, dominant in low-income countries (Walwei, 2016; Sorgner, 2020; Charles and others, 2022). This indicates the need for supplementary policies that focus on communities at risk, including those on the borderline of poverty, those affected by skill mismatches, and underserved groups.

## 5. CONCLUSION



*“When appropriately regulated, digital trade and investment can significantly enhance all three pillars of the SDGs.”*

In summary, central to this chapter is the proposition that, when appropriately regulated, digital trade and investment can significantly enhance economic growth, social inclusion and environmental sustainability. The chapter underscores digital trade's potency in spurring economic growth by enabling businesses to diversify, tap into global markets and fuel innovation. Beyond the economic dimension, the narrative accentuates the instrumental role of digital platforms in supporting social inclusivity. Digital trade not only facilitates wider access to essential services such as health, education, and financial services, but also empowers marginalized groups. However, the environmental implications warrant vigilant attention.

The empirical analysis presented highlights evidence of the promising role digital trade plays as a means to achieve SDGs. While it paints a generally favourable picture, it also highlights potential challenges and pitfalls that need to be considered. Neglecting challenges such as the digital divide, overlooking marginalized groups and sidelining environmental concerns can lead to detrimental effects that outweigh the potential benefits.

## Annex. Mapping digital trade and SDG targets

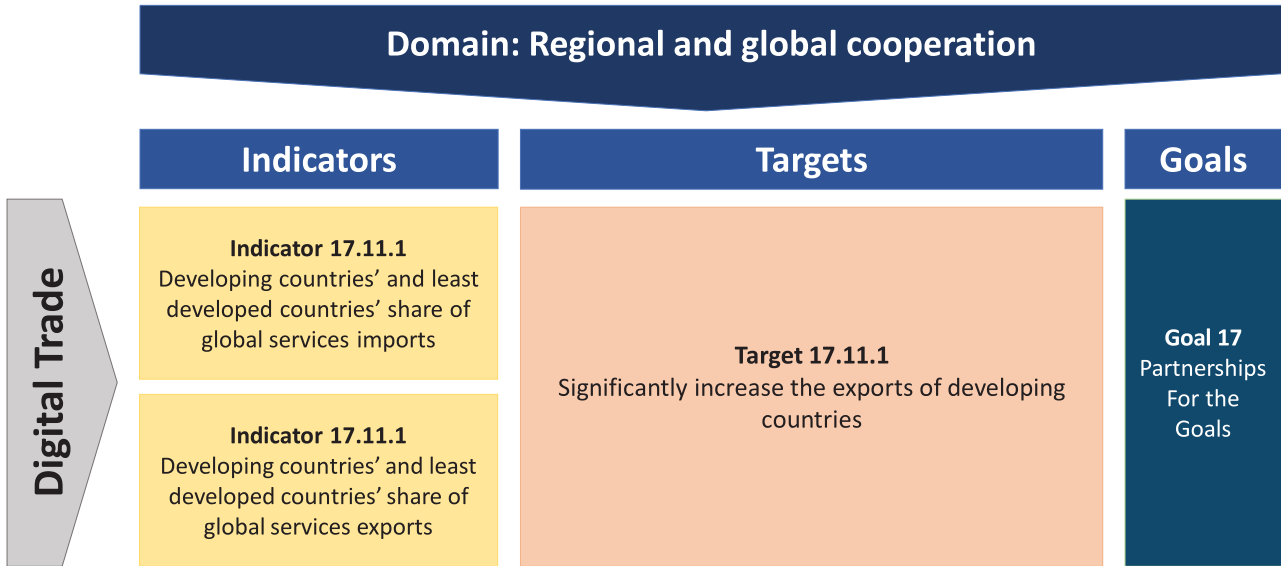
The SDG indicators used in the empirical investigation are presented below by SDG domain. Only the indicators that exhibit significant estimated coefficients are displayed on this map.

Domain: Economic growth and poverty reduction			
Digital Trade	Indicators	Targets	Goals
	<b>Indicator 1.1.1</b> % of population below the international poverty line	<b>Target 1.1</b> Eradicate extreme poverty for all	<b>Goal 1</b> No Poverty
	<b>Indicator 1.4.1</b> % of population living in households with access to basic services	<b>Target 1.4</b> Ensure that people have equal rights to economic resources	
	<b>Indicator 8.1.1</b> Annual growth rate of real GDP per capita	<b>Target 8.1</b> Sustain per capita economic growth	<b>Goal 8</b> Decent Work and Economic Growth
	<b>Indicator 9.3.1</b> % of small-scale industries in total industry value added	<b>Target 9.3</b> Increase the access of small-scale industrial and other enterprises to financial services	<b>Goal 9</b> Industry, Innovation & Infrastructure
	<b>Indicator 9.b.1</b> % of medium and high-tech industry value added in total value added	<b>Target 9.b</b> Support domestic technology development, research and innovation in developing countries	

Domain: Social inclusion, health, education			
Digital Trade	Indicators	Targets	Goals
	<b>Indicator 3.4.1</b> Mortality rate attributed to cardiovascular disease, cancer, diabetes or chronic respiratory disease	<b>Target 3.4</b> Reduce by one third premature mortality from non-communicable diseases	<b>Goal 3</b> Good Health and Well-being
	<b>Indicator 4.2.2</b> Participation rate in organized learning	<b>Target 4.2</b> Ensure that all girls and boys have access to quality early childhood development	<b>Goal 4</b> Quality Education
	<b>Indicator 4.3.1</b> Participation in education	<b>Target 4.3</b> Ensure equal access for all women and men to affordable and quality education	
	<b>Indicator 5.5.2</b> Proportion of women in managerial positions	<b>Target 5.5</b> Ensure women's full and effective participation and equal opportunities for leadership in political, economic and public life	<b>Goal 5</b> Gender Equality
	<b>Indicator 10.5.1</b> Return on assets	<b>Target 10.5</b> Improve the regulation and monitoring of global financial markets	<b>Goal 10</b> Reduced Inequality
	<b>Indicator 10.c.1</b> Remittance costs as % of the amount remitted	<b>Target 10.c</b> Reduce to less than 3 per cent the transaction costs of migrant remittances	

Domain: Environmental sustainability			
Digital Trade	Indicators	Targets	Goals
	<b>Indicator 6.4.1</b> Change in water-use efficiency over time	<b>Target 6.4</b> Increase water-use efficiency, ensure sustainable withdrawals and supply of freshwater, and reduce the number of people suffering from water scarcity	<b>Goal 6</b> Clean Water and Sanitation
	<b>Indicator 7.2.1</b> Renewable energy share in the total final energy consumption	<b>Target 7.2</b> Increase the share of renewable energy	<b>Goal 7</b> Affordable and Clean Energy
	<b>Indicator 12.5.1</b> Municipal waste recycled	<b>Target 12.5</b> substantially reduce waste generation through prevention, reduction, recycling and reuse	<b>Goal 12</b> Responsible Consumption and Production
	<b>Indicator 13.2.2</b> Total greenhouse gas emissions without LULUCF for non-Annex I Parties	<b>Target 13.2</b> Integrate climate change measures into national policies, strategies and planning	<b>Goal 13</b> Climate Action
	<b>Indicator 13.2.2</b> Total greenhouse gas emissions without LULUCF for Annex I Parties		
	<b>Indicator 15.1.2</b> Proportion of forest area within legally established protected areas	<b>Target 15.1</b> Ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems	<b>Goal 15</b> Life on Land





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CHAPTER



# Trends in digital trade and investment in Asia and the Pacific



As underscored in chapter 1, the digital trade and investment ecosystem is integrated by three broad elements: (1) digital trade flows; (2) digital trade; and (3) investment. The state of play in the Asia-Pacific region for each of these elements is presented in this chapter. The chapter also delves into the trends and challenges in digital trade and investment facing the Least Developed Countries (LDCs) in the Asia-Pacific region.

## 1. DIGITAL TRADE

Digital trade encompasses international trade flows that are digitally ordered and/or digitally delivered (see chapter 1). While data collection has not yet allowed computation of a single indicator that captures the full magnitude of digital trade flows, studies typically use trade flows of digitally deliverable services to a proxy to gauge trends in digital trade, with a particular focus on the digitally delivered component. Digitally deliverable services refer to those that can be conveyed through an ICT network (IMF, OECD, UNCTAD and WTO, 2023). Using the indicated proxy, it was found that exports of digitally deliverable services totalled US\$ 3.9 trillion in 2022, representing 55% of global services trade. During 2022, the Asia-Pacific region exported digitally deliverable services worth of approximately US\$ 958 billion, which represents 52% of total services exports from the region.

### 1.1 Digitally delivered trade

*“The Asia-Pacific region represents about a quarter of global digitally deliverable trade. Between 2015 and 2022, the region’s exports grew at 8.6% per year, surpassing the global growth rate of 6.8%.”*

Globally, exports of digitally deliverable services grew by 6.8% per year during the 2015-2022 period.<sup>1</sup> This rate outpaced the growth of total commercial services exports, which was 5.1% per year in the same period.

The Asia-Pacific region represents about a quarter of global digitally deliverable services trade. The region’s

exports of digitally deliverable services grew by 8.6% annually, with imports increasing at 7.2% per year between 2015 and 2022. With its dynamic trade performance, the region’s share in the global exports of digitally deliverable services gradually increased from 22% in 2015 to 24% in 2022, and its portion of global imports also modestly increased from 23% to 24%.<sup>2</sup>

*“Intraregional demand constituted a substantial 39% of the region’s exports.”*

Growing intraregional demand is the main driver of digitally deliverable service exports in the Asia-Pacific region. Between 2015 and 2021, the proportion of intra-regional exports rose from 36% to 39%. The top-five markets of Asia-Pacific intraregional exports were: Hong Kong; China, China, Japan, Singapore and Australia (right-side figure 2.1). Outside of the region, economies in the European Union and North America are the main trading partners. These advanced markets accounted for 27% and 20% of the region’s exports, respectively (left-side figure 2.1).

*“Six economies contributed 85% of the region’s exports in digitally deliverable services.”*

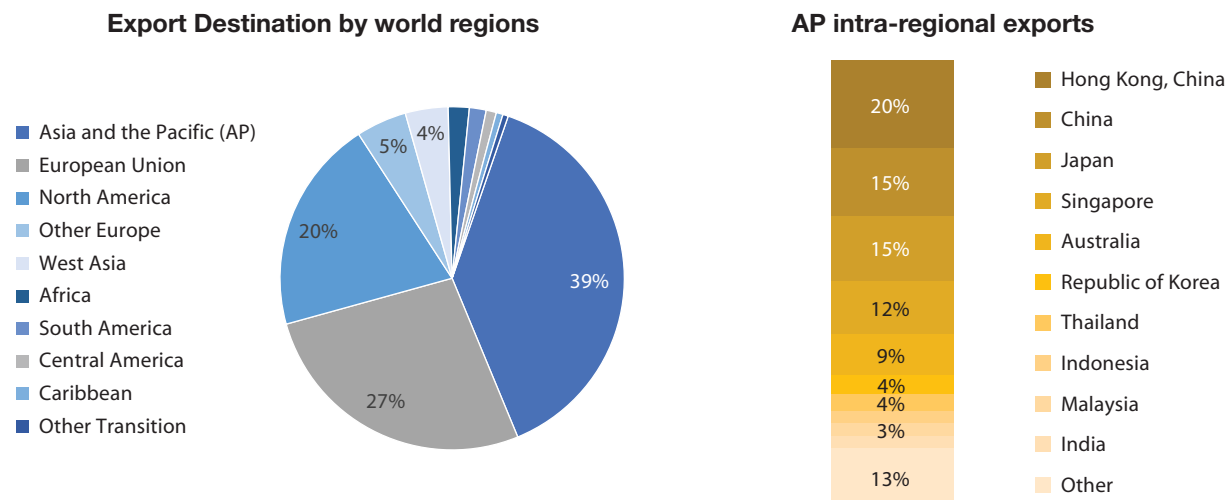
East and North-East Asia’s (ENEA) exports made up nearly 44% of the region’s digitally delivered exports in 2022 (figure 2.2). South-East Asia (SEA), and South-West Asia (SSWA) together accounted for half of the Asia-Pacific digital service exports. Notably, 85% of the region’s exports were contributed by just six economies – India, China, Singapore, Japan, the Republic of Korea, and Hong Kong; China.

*“Digitally deliverable services have become a major export sector of many developing Asia-Pacific economies.”*

Increasingly, digitally deliverable services are becoming important exports in economies across the region, as they represent more than half the region’s services exports (figure 2.3). This shift has been largely driven by the repercussions of the COVID-19 pandemic. As the post-pandemic landscape continues

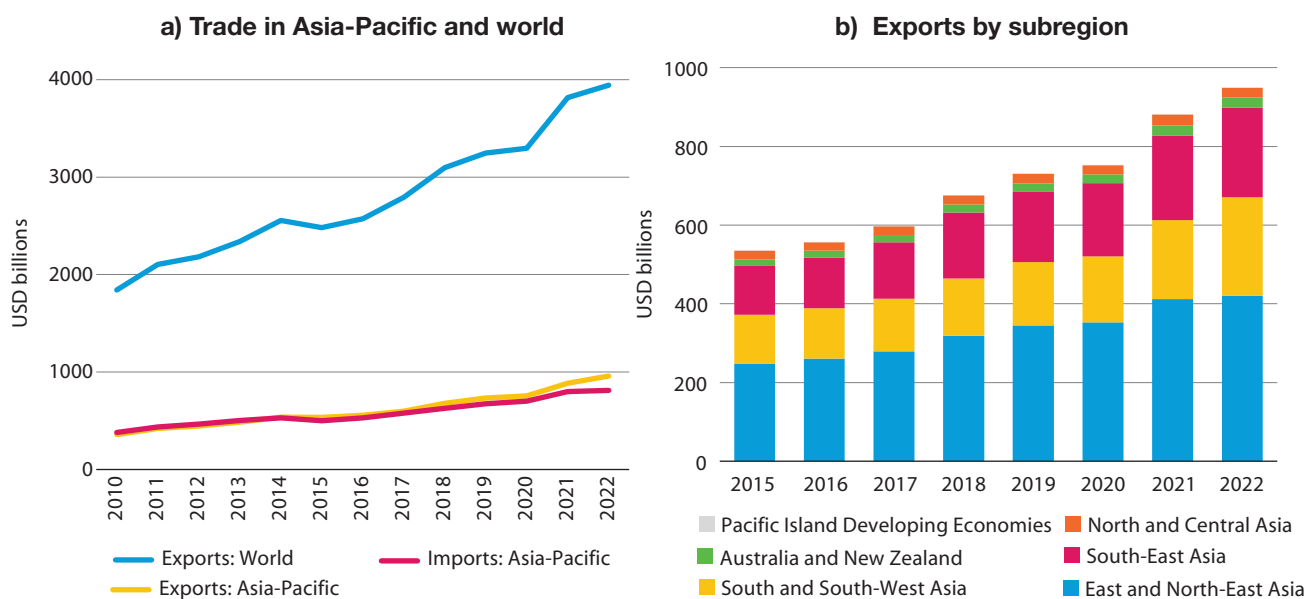
<sup>1</sup> The annual growth rates presented in this chapter are based on the compound annual growth rate (CAGR) method.

<sup>2</sup> For a comprehensive review of digital service trade trends in Asia and the Pacific, see ADB, 2022.


**Export destination of Asia-Pacific digitally deliverable services, 2021**


Source: ESCAP, based on WTO-OECD Balanced Trade in Services Dataset (BaTIS) — BPM6 (<https://www.oecd.org/sdd/its/balanced-trade-statistics.htm>).

Note: As the BaTIS covers only 12 main EBOPS 2010 services categories, these estimates do not precisely align with, or fully capture, digitally deliverable service product classes set out in the IMF-OECD-UNCTAD-WTO Handbook on Measuring Digital Trade (<https://unctad.org/publication/handbook-measuring-digital-trade>). In addition, BaTIS relies on estimations and adjustments to address asymmetries in reported trade figures and when economies do not report trade information. For more information, please see: Liberatore and Wettstein (2023). The OECD-WTO Balanced Trade in Services Database (BaTIS) (<https://www.oecd.org/sdd/its/OECD-WTO-Balanced-Trade-in-Services-database-methodology-BPM6.pdf>).


**Trade in digitally deliverable services in Asia-Pacific and subregions**


Source: UNCTAD, based on UNCTAD Digital Economy Database (<https://unctadstat.unctad.org/wds/>).

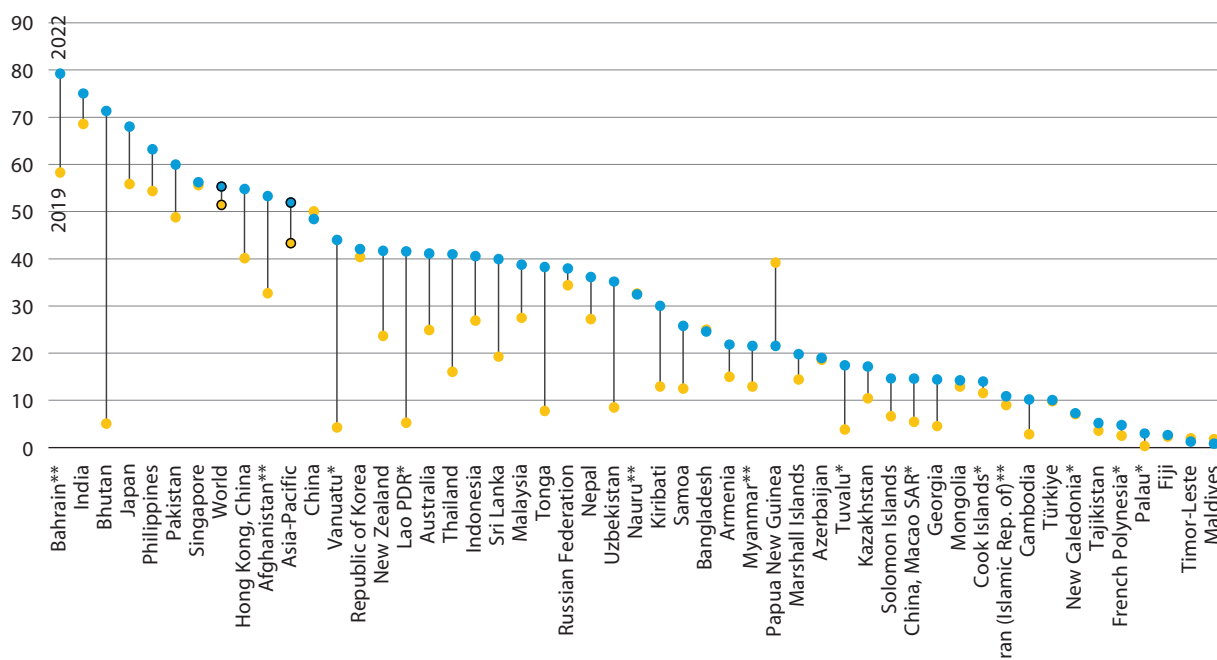
Note: Trade value includes interregional trade.

to evolve, experts anticipate that the digitalization of the service export sector is not only here to stay but is something countries will need to actively prepare for and engage with (UNCTAD, 2022). Such a

transformation may prove challenging for many PIDEs and LDCs, particularly those economies where the share of digitally deliverable services in their service trade is still negligible.



**Figure 2.3** Percentage of digitally deliverable services in total services exports for the Asia-Pacific economies, 2019 and 2022



Source: UNCTAD, based on UNCTAD Digital Economy Database (<https://unctadstat.unctad.org/wds/>).

Note: \*2021 instead of 2022; and \*\*2020 instead of 2022.

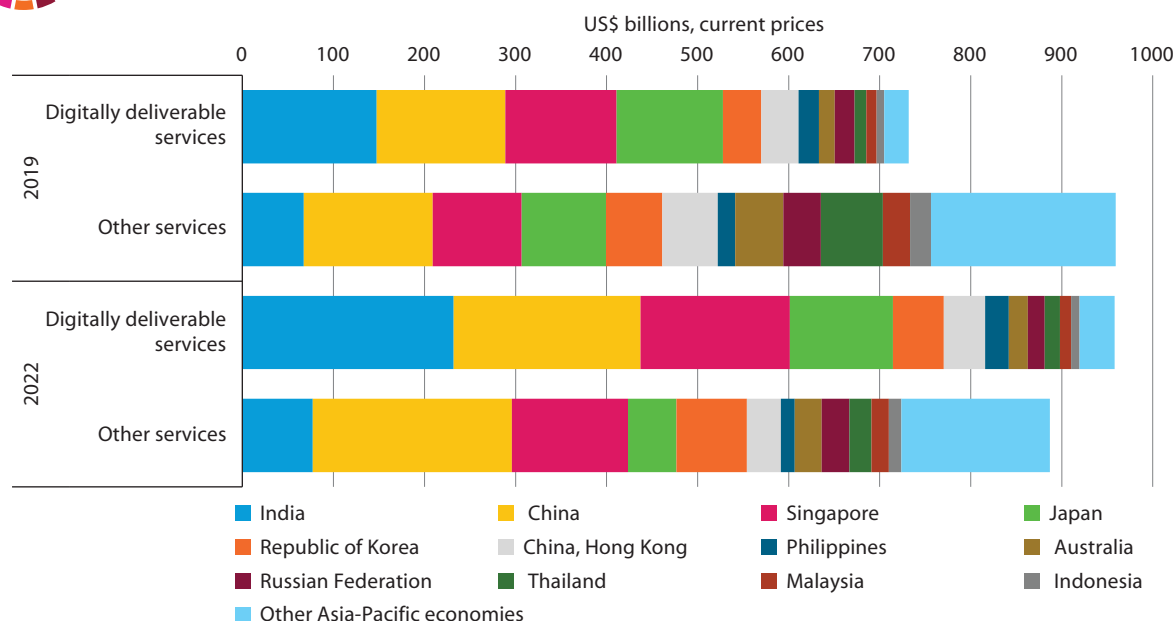
*“Trade concentration is greater for digitally deliverable services than for other services exports.”*

Trade in digitally deliverable services exhibits a higher concentration compared to other types of service exports. In 2022, the leading five economies (India, China, Singapore, Japan, and the Republic of Korea) were responsible for 80% of the Asia-Pacific region's exports in digitally deliverable services. By contrast, the top-5 economies accounted for only 60% of the region's exports in other types of services (figure 2.4).

Four services sectors have been leading exports of digitally deliverable services across the Asia-Pacific region. During 2010-2022, exports of telecommunication, computer and information services together with professional and management consulting services accounted for average shares of 23% and 24% of the region's digitally deliverable services exports. Among digitally deliverable services, audiovisual and related services experienced impressive growth, with an annual compound growth rate of 12% from 2010 to 2022 (figure 2.5).



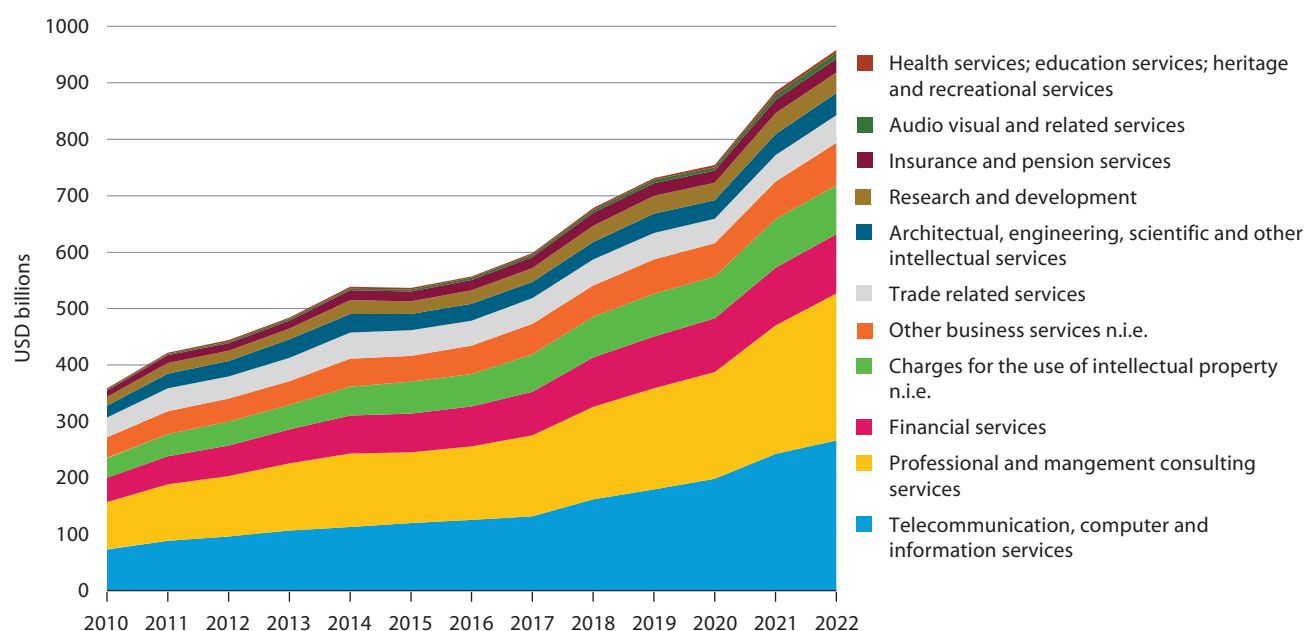
**Figure 2.4** Concentration of digitally deliverable services and other services exports in the Asia-Pacific region, 2019 and 2022



Source: UNCTAD, based on UNCTAD Digital Economy Database and UNCTAD trade in services database (<https://unctadstat.unctad.org/wds/>).



**Figure 2.5** Exports of digitally deliverable services by service category in the Asia-Pacific region, 2010-2022



Source: UNCTAD, based on UNCTAD Digital Economy Database (<https://unctadstat.unctad.org/wds/>).

Note: Total value includes non-publishable data.

## 1.2 Digitally ordered trade

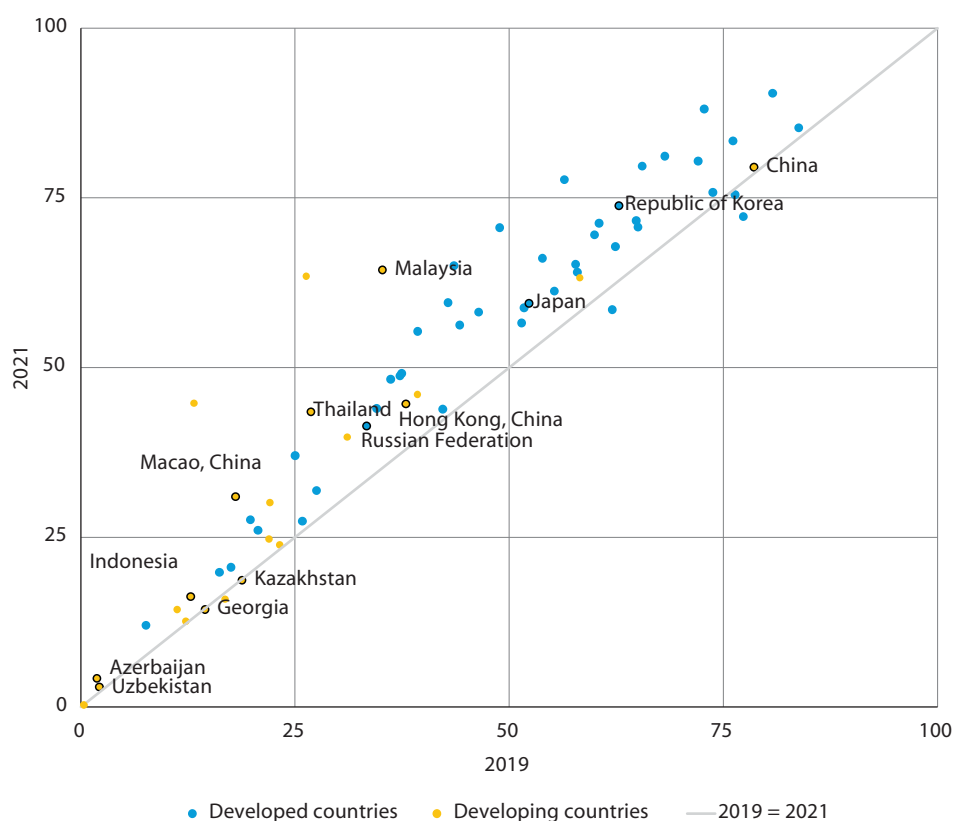
While international transactions constitute a minor fraction of total e-commerce activities, e-commerce data offer valuable insights into the digitally ordered facet of digital trade. Based on UNCTAD (2023), cross-border transactions represented roughly 15% of total e-commerce in both Malaysia and Thailand. Notably, these transactions accounted for about 5% to 8% of exports in these two countries (box 2.1).

*“ENE and SEA economies dominate digitally ordered trade in the region.”*

The trend in digitally ordered trade mirrors that of digitally deliverable services. For instance, in B2C e-commerce, China and the Republic of Korea dominate the region's e-commerce market volume. Furthermore, between 2019 and 2021, Malaysia, Thailand and Macau, China, witnessed some of the fastest growth rates in online shopping (figure 2.6). Conversely, North and Central Asian countries reported much lower rates of online shopping.



Percentage of Internet users who made purchases online, 2019 and 2021



Source: UNCTAD, based on Eurostat Digital Economy and Society Statistics database, OECD ICT Access and Usage by Households and Individuals database, ITU World Telecommunication/ ICT Indicators database.

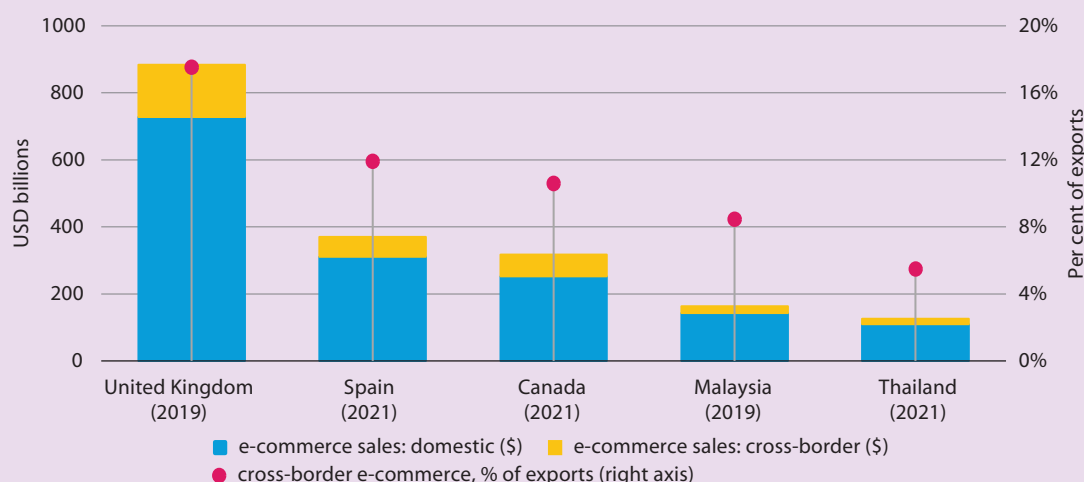
Note: For Canada, Colombia, Hong Kong; China, Kuwait, Macao; China, Mauritius, Morocco, Ukraine, Uzbekistan; 2018 instead of 2019. For Canada, China, El Salvador, Hong Kong; China, Indonesia, Kosovo, Mauritius, Paraguay, Qatar, Thailand, the United Kingdom, 2020 instead of 2021.



### The estimated share of cross-border e-commerce

Even though e-commerce has been widely adopted among individuals and businesses in many countries, comprehensive figures on e-commerce sales value remain scarce, as few national statistical agencies have published such data. Nevertheless, several Asia-Pacific economies are leading in quantifying the revenue businesses generate from online sales (UNCTAD, 2023). Based on available data from countries such as Malaysia and Thailand, it is estimated that approximately 20% of global e-commerce sales conducted by businesses are international transactions. This represents an average contribution of around 10% to the total exports of goods and services (see figure below).

**Domestic and international e-commerce sales in selected countries**



Source: UNCTAD, adapted from UNCTAD (2023) “Measuring the value of e-commerce” (<https://unctad.org/publication/measuring-value-e-commerce>).

China has also been undertaking efforts to improve measurements of cross-border e-commerce. In 2014, China Customs initiated the implementation of specific customs procedures codes under the label “CBEC (cross-border e-commerce)”, to capture statistics on digitally ordered trade from a customs control perspective. Preliminary results show that CBEC in China has grown from US\$ 187 billion in 2019 to US\$ 309 billion in 2022, with exports and imports increasing 98% and 11% during the period, respectively.

**Cross-border e-commerce in China, 2019-2022**

Year	Value in billion US\$			Year-on-year (%)		
	Total	Export	Import	Total	Export	Import
2019	187	116	71	17.0	24.9	6.1
2020	234	157	77	25.2	35.5	8.7
2021	297	215	82	27.0	37.4	6.1
2022	309	230	79	3.8	6.7	-3.8

Source: IMF, OECD, UNCTAD, and WTO (2023) “Handbook on Measuring Digital Trade” (<https://unctad.org/publication/handbook-measuring-digital-trade>).

## 2. DIGITAL TRADE ENABLERS

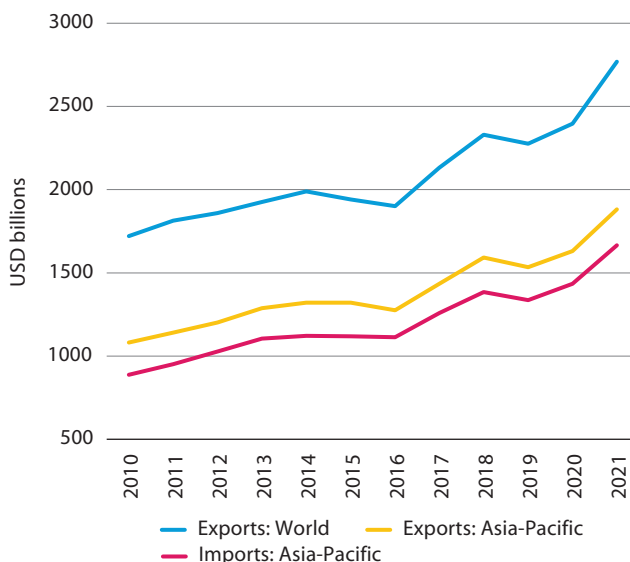
*“The Asia-Pacific region dominates global ICT goods exports, accounting for more than 60% of the global total.”*

Part of digital trade enablers include ICT goods. Trade patterns of these products follow the position of Asia-Pacific economies in the global value chains. The Asia-Pacific region dominates global ICT goods exports, accounting for more than 60% of the global market share when measured in gross terms (figure 2.7). In comparison, the European Union and North America contribute substantially less, accounting for around 27% and 6%, respectively in 2022. Meanwhile, the Asia-Pacific region contributes approximately 44% of global imports, with the European Union and North America following at 28% and 17%, respectively. This trade share is largely driven by East Asian economies, including those in the ENEA and the SEA, which have established themselves as manufacturing centres for ICT products.<sup>3</sup> Notably, approximately two-thirds of the region’s ICT imports consists of intermediate inputs that are essential for producing ICT goods. In contrast, the region’s ICT exports primarily comprise finished products.

In addition to ICT goods, ICT services constitute a key component of digital trade. ICT services span a broad spectrum. They encompass telecommunications services and a variety of computer services, including IT design, development, consulting, and business support. Further categories involve hosting, infrastructure provisioning, maintenance and repair services for ICT, and the production and distribution of software. Most of these services are also digitally deliverable.



**Trade in ICT goods: Global and Asia-Pacific, 2010-2022**



Source: UNCTAD, based on Digital Economy Database (<https://unctadstat.unctad.org/wds/>).

*“Trade in ICT goods, ICT services, and digital trade are interconnected.”*

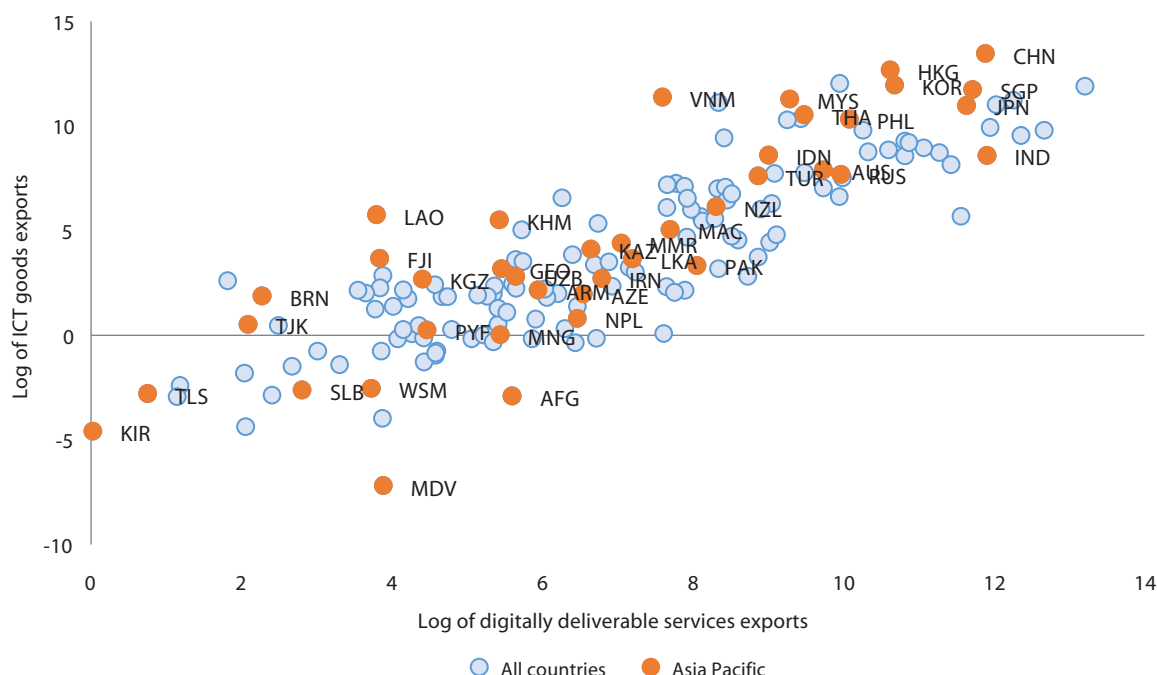
A robust correlation exists between exports of ICT goods and that of digitally deliverable services (figure 2.8). This correlation emphasizes the concentrated nature of digital trade. Similarly, in terms of service trade concentration, East Asian economies, including those in the ENEA and SEA subregions, play a pivotal role in regional trade for both digital trade and ICT services. Notably, South Asian economies, with India standing out, also feature prominently in these services.

<sup>3</sup> Electronic components, used as inputs in ICT production, accounted for a large portion of the value of ICT goods imported by Asia-Pacific economies. In contrast, most ICT goods exports consist of finished ICT products like computers and communication equipment. For details, see UNCTAD’s Digital Economy Database at <https://unctadstat.unctad.org/wds/ReportFolders/reportFolders.aspx>



**Figure 2.8**

**Relationship between ICT goods exports and digitally deliverable services exports, 2017-2021 average**



Source: ESCAP, based on UNCTAD Digital Economy Database (<https://unctadstat.unctad.org/wds/>).

### 3. DIGITAL FDI

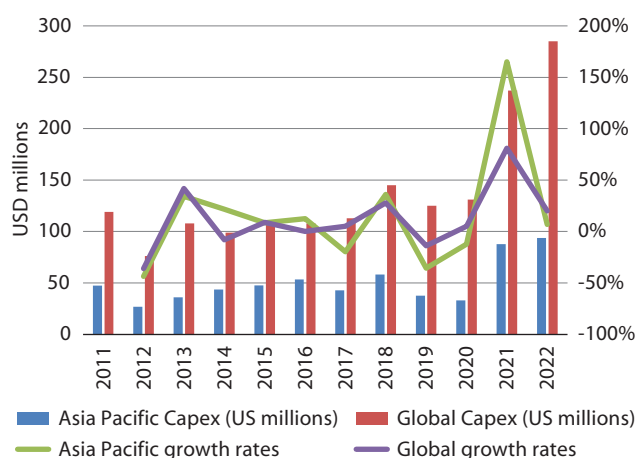
*“The Asia-Pacific region’s digital FDI peaked at US\$ 93 billion in 2020, underlying a growth of 165% year-on-year that has been outpacing global growth rates.”*

The interplay between the COVID-19 pandemic and the digital transformation significantly affected the landscape of digital foreign direct investment (FDI). In 2020, the Asia-Pacific region attained an annual growth of 165% in digital FDI, which outpaced global growth rates (figure 2.9). Data processing, communications, and semiconductors became the leading beneficiaries of global greenfield FDI in 2021 (Barklie and others, 2022).

Since the past decade, consistent increases in FDI have been seen across digital sectors, such as software and IT services as well as electrical and electronic components.<sup>4</sup> A noteworthy strategic move

**Figure 2.9**

**Global and Asia-Pacific greenfield digital FDI inflows (US\$ millions and annual growth)**



Source: ESCAP, based on fDi Markets (2023) (<https://www.fdimarkets.com/>).

Note: Capex stands for Capital expenditure.

<sup>4</sup> This includes audio and video equipment, communication and energy wires and cables, wiring devices, magnetic and optical media, and other electrical equipment needed to run the digital economy.

by digital enterprises has been the adoption of Mergers and Acquisitions (M&As) to expand to new markets and business sectors. Digital sectors have seen some of the world's largest M&A deals, including Verizon's acquisition of Vodafone's Verizon Wireless stake, AT&T's Time Warner takeover and Microsoft's Activision Blizzard purchase.

*"The semiconductor sector attracted 50% of greenfield FDI inflows in 2021, up from 25% in 2011."*

The significant increase of digital FDI has been correlated with the rise in digital connectivity and consumers' embrace of digital technology. Greenfield FDI in core digital sectors rose from US\$ 43 billion in 2011 to US\$ 93 billion in 2022, with a predominant share allocated to the semiconductor industry (figure 2.10). As a global hub for semiconductor manufacturing, the region recorded a significant increase in investments from digital infrastructure and device firms. Intel and Micron Technology, for example, funnelled investments to establish semiconductor plants in Malaysia and Japan, respectively. GlobalFoundries (United Arab Emirates) channel FDI for building a chipmaking plant in

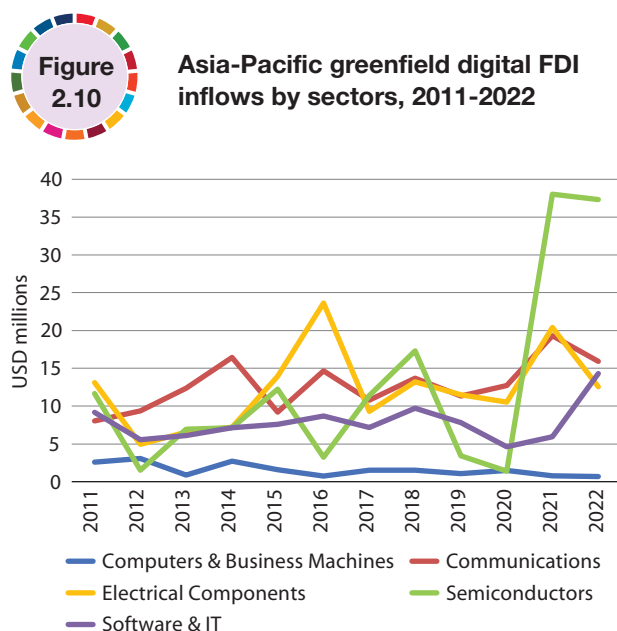
Singapore (Barklie and others, 2022). Consequently, the share of the semiconductor sector in the total greenfield FDI inflows increased to 50% in 2021, up from 25% in 2011.

*"China and India have been the most prominent digital FDI destinations since 2011."*

Similar to patterns observed in digital trade, digital FDI inflows exhibit an uneven distribution across the region. The bulk of these inflows went into the ENEA, the SSWA, and the SEA. Since 2011, China and India have been the most important destinations for digital FDI (figure 2.11). During the same period, the United States has remained as the principal investor in the Asia-Pacific region's digital sector. Nonetheless, intraregional digital FDI contributions from countries such as the Republic of Korea, China, Japan, and Hong Kong; China, are quite significant.

*"Following the COVID-19 pandemic, several countries in South and South-East Asia witnessed notable increases in digital FDI."*

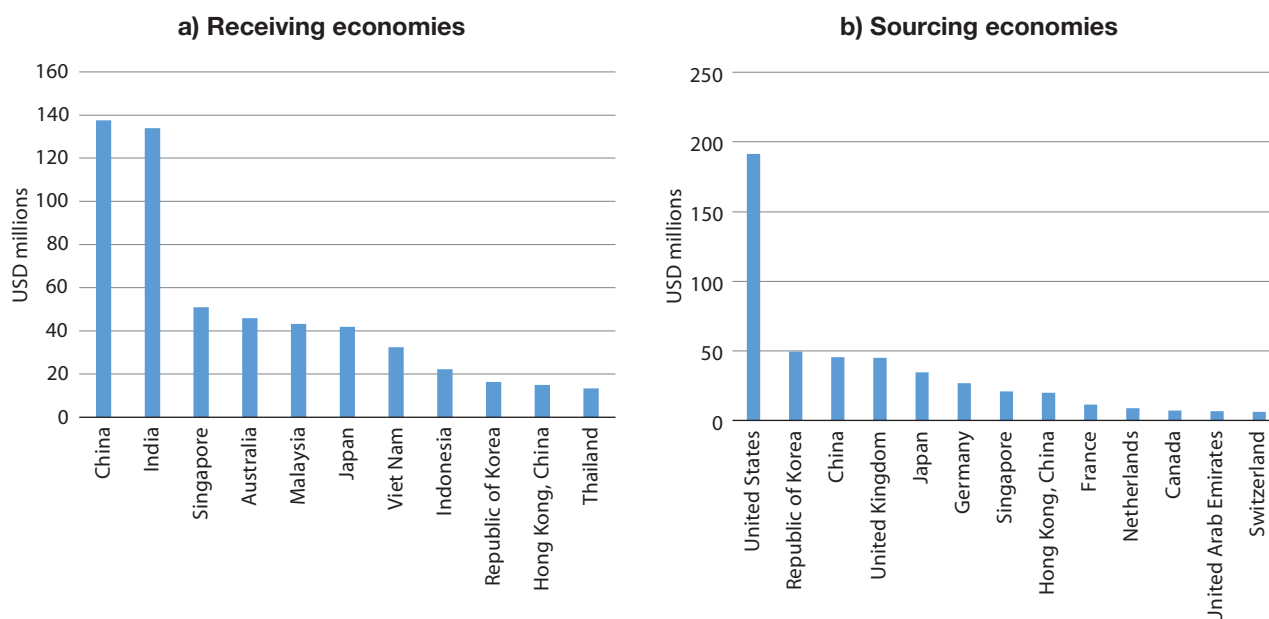
After the COVID-19 pandemic, many economies in South and South-East Asia experienced significant growth in digital FDI. For example, Viet Nam observed unprecedented investments in the Electronic Components sector, a pivotal area for the progression of the Digital Economy. From 2020 to 2022, this sector became the country's second-largest recipient of FDI, and by July 2023, it emerged as Viet Nam's top target sector. Likewise, Malaysia saw a marked rise in FDI related to Electronic Components in 2021 and the first half of 2023. The Communications sector in Malaysia also experienced a significant surge in FDI during the initial half of 2023. India, which has consistently attracted substantial FDI inflows in the Digital Economy-related sectors during the past decade, registered exponential growth in FDI for the Communications, and Software and IT Services sectors post-COVID-19. These patterns emphasize a geographical redistribution and dispersal of digital FDI, moving away from some traditional host nations. This shift reflects the digital developmental progress achieved by these countries and the strategic decisions by foreign investors in response to geopolitical dynamics.



Source: ESCAP, based on fDi Markets (2023) (<https://www.fdimarkets.com/>).



**Asia-Pacific digital FDI by recipient and source, 2011-2022 (US\$ millions)**



Source: ESCAP, based on fDi Markets (2023) (<https://www.fdimarkets.com/>).

#### 4. SPECIAL FOCUS ON LDCs: TRENDS AND CHALLENGES



*“Digitally deliverable services have grown in significance in LDCs, accounting for 25% of their service exports and 19% of their service imports.”*

Digital trade holds significant potential for LDCs to diversify their export portfolio. While LDCs account for less than 1% of the digitally deliverable services exports in the region, these services have gained prominence in their trade structure. In 2022, they constituted 26% of service exports and 17% of service imports, marking an increase from the 2017-2019 period averages of 13% for exports and 16% for imports that were observed before the COVID-19 pandemic.<sup>5</sup> Particularly, Nepal, Afghanistan, Bhutan, Kiribati and Lao People’s Democratic Republic exhibit strong dependence on exports of digital services, approaching or surpassing non-LDC

averages, especially as their main service exports like tourism were hit hard by COVID-19 lockdowns (figure 2.12).

According to the World Bank’s Global Index data, only 7% of adults within the Asia-Pacific LDCs engage in online purchases. This contrasts sharply with the non-LDCs, where the participation rate averages 36%. It is important to recognize that this percentage captures domestic consumer trends and does not represent the range of digitally ordered trade possibilities within LDCs.<sup>6</sup> Nevertheless, these figures shed light on the disparate e-commerce climate across the region.



*“In 2021, Asia-Pacific LDCs attracted just 0.10% of the region’s digital FDI inflows.”*

A consistent trend is observed for digital FDI. In 2021, Asia-Pacific LDCs attracted just 0.10% of the region’s digital FDI inflows (figure 2.13). This indicates

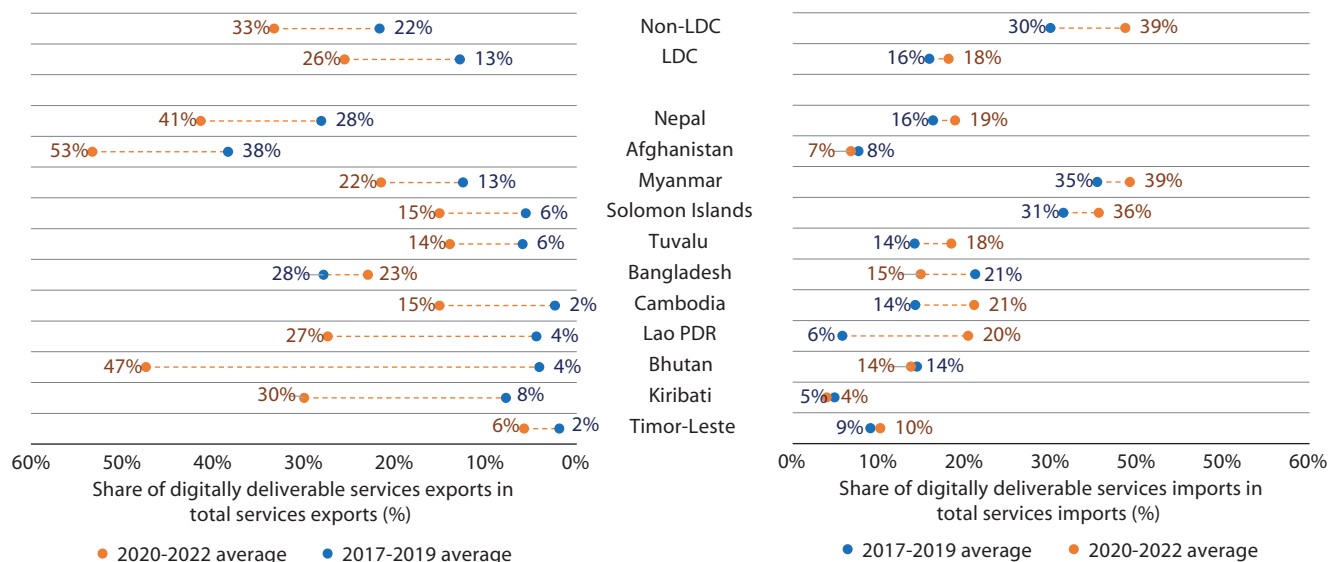
<sup>5</sup> ESCAP, based on UNCTAD Digital Economy Database (<https://unctadstat.unctad.org/wds/>).

<sup>6</sup> Generally, the majority of e-commerce transactions occur through Business-to-Business (B2B) e-commerce. According to UNCTAD (2020), global B2B e-commerce accounted for 82% of all e-commerce transactions in 2019.



**Figure  
2.12**

### Shares of digitally deliverable services in services trade in Asia-Pacific LDCs

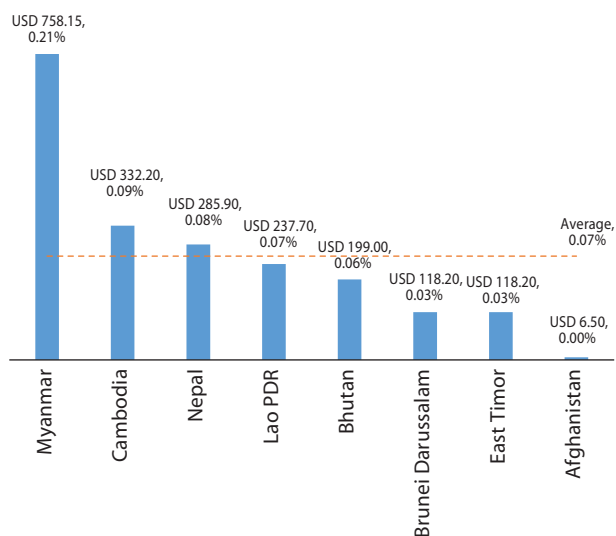


Source: ESCAP, based on UNCTAD Digital Economy Database (<https://unctadstat.unctad.org/wds/>).

Note: Chart figures represent averages of values reported by countries for the indicated periods. 2022 figures are not available for Afghanistan, Kiribati, Lao People's Democratic Republic (Lao PDR), Myanmar and Tuvalu. 2021 figures are not available for Afghanistan and Myanmar. Kiribati's figures are not available for 2017, 2020 and 2022.



### Digital FDI in selected Asia-Pacific LDCs



Source: ESCAP, based on fDi Markets (2023) (<https://www.fdimarkets.com/>).

Note: Top label values show FDI values in thousands of US dollars and bottom label values indicate each LDC's share of total FDI in the Asia Pacific from 2017 to 2022.

a potential underinvestment in infrastructure sectors that are essential for attracting broader digital FDI flows in this group of countries. The significance of this underinvestment becomes even more apparent when considering the requirements for active participation in digital trade. To fully participate in, and benefit from digital trade, online access is crucial. This necessitates not only Internet infrastructure, such as mobile and fixed broadband networks, but also additional supporting infrastructure, including electricity, to power digital devices.

*“Digital infrastructure limitations in Asia-Pacific LDCs are only part of the digital trade challenge; other challenges include high trade and transaction costs, skill deficits and regulatory gaps.”*

Geographical challenges, skill deficiencies and regulatory gaps contribute to the untapped potential of LDCs in digital trade and investment. In fact, several LDCs such as Cambodia, Bangladesh, Myanmar and Bhutan, have 4G network coverage rates comparable to those in non-LDCs (see

chapter 1, figure 1.3). However, except for Bhutan, these countries still record small fractions of their populations that actively use the Internet. This suggests the presence of barriers beyond just the ICT infrastructure gap. Among others, a notable barrier is the lack of skills necessary for adopting digital trade. For example, in the Lao People's Democratic Republic, e-commerce skills and know-how are limited, even among tech startups and entrepreneurs (UNCTAD, 2018).

Another layer of barriers for LDCs to participate in digital trade and investment relates to the policy environment. Regulatory challenges contribute to limited competition and high access costs in services that are essential for digital connectivity and digital trade, such as ICT, logistics and financial services. For example, in Bangladesh, cross-border payments are subject to international transaction limits (UNCTAD, 2019). Furthermore, digital business groups, such as start-ups and e-commerce merchants, frequently encounter limited access to financial resources. Similarly, in Nepal, small businesses often rely on informal financial services due to their lack of access to the banking sector's financial instruments. Concurrently, banks often view e-commerce as a high-risk sector and typically hesitate to provide financing to e-commerce merchants, particularly small businesses.

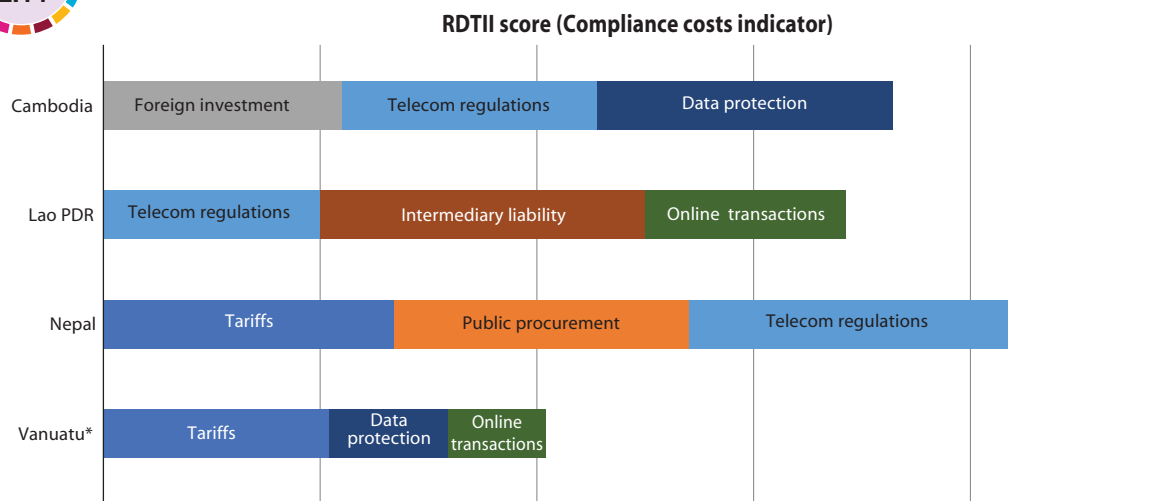
Recent assessments of the digital trade policy environment in Asia and the Pacific have provided a contrasting picture of where LDCs stand in comparison to their non-LDCs counterparts in the region. The ESCAP's Regional Digital Trade Integration Index (RDTII) database indicates that LDCs such as the Lao People's Democratic Republic and Nepal, have regulatory bottlenecks and high compliance costs that arise partly from foreign investment restrictions, competition and regulation in the telecommunications sector, and tariffs and technical standards on ICT goods (ESCAP and OECD, 2022).

*“Telecommunications, data protection, and internet governance are key areas where LDCs frequently exhibit substantial gaps.”*

The digital policy gap in Asia-Pacific LDCs is prominently observed in areas of telecommunications, data protection and Internet governance (figure 2.14). In Cambodia, the Lao People's Democratic Republic and Nepal, telecommunications policies and device tariffs likely to increase the costs of accessing and adopting digital technology. In addition, their regulations concerning data protection and online transactions potentially add further costs to digital trade businesses in these Asia-Pacific LDCs.

**Figure 2.14**

**Policy-induced challenges related to digital trade in selected Asia-Pacific LDCs**



Source: ESCAP, based on the Regional Digital Trade Integration Index (RDTII) database (<https://dtri.uneca.org/escap/home>).

Note: \*Vanuatu has graduated from the LDC status since 2020.

## 5. CONCLUSION


The Asia-Pacific region is a major contributor to global digital trade, accounting for a substantial 25% of the world's trade in digitally deliverable services. Particularly, the developing Asia-Pacific region is capitalizing on its vast domestic and regional markets to catch up with more advanced economies.

Digital investments help boost digital trade in the region. The United States remains the biggest investor, but intraregional investments, mainly from China and the Republic of Korea, are growing. After COVID-19, digital investments in the region grew faster than the global average. The semiconductor industry, in particular, benefited from these investments, partly because of geopolitical issues.

 *“Digital trade and investment opportunities are concentrated in a few major economies.”*

However, most digital trade and investment opportunities are concentrated in a few major

economies. When it comes to digitally deliverable exports, six economies — India, China, Singapore, Japan, the Republic of Korea, and Hong Kong; China — dominate, making 85% of the exports. Most digital trade occurs in the ENEA subregion, while economies in the SEA subregion are experiencing rapid growth in this sector.

 *“Addressing the complex challenges of digital trade in developing economies requires more than investment in physical infrastructure.”*

Asia-Pacific LDCs are witnessing growth in digital trade, however they face inherent fundamental challenges. With limited digital investment, their ability to sustain progress in digital trade could be hindered.

In general, addressing the complex challenges of digital trade in developing economies requires more than just investment in physical infrastructure. It also necessitates soft infrastructure, including a conducive regulatory environment, a topic that will be explored in subsequent chapters of this report.

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CHAPTER



# Trends and development in digital trade and investment policies in the Asia and the Pacific

This chapter provides an overview of the policy landscape. The discussion groups digital trade and investment policies based on their broad implications for sustained economic growth: policies influencing infrastructure and cost of access, policies supporting e-commerce and digital services trade, policies affecting innovation and the adoption of Industry 4.0 technologies.

## 1. OVERALL REGULATORY LANDSCAPE

A well-structured regulatory framework is essential for fostering dynamic digital trade and reaping sustainable development benefits. However, excessive regulatory interventions can restrict the categories of products that can be remotely delivered or ordered. For example, banning cross-border data flows can hinder not only digital trade but also the evolution of digital value chains, both of which are vital engines for economic growth.

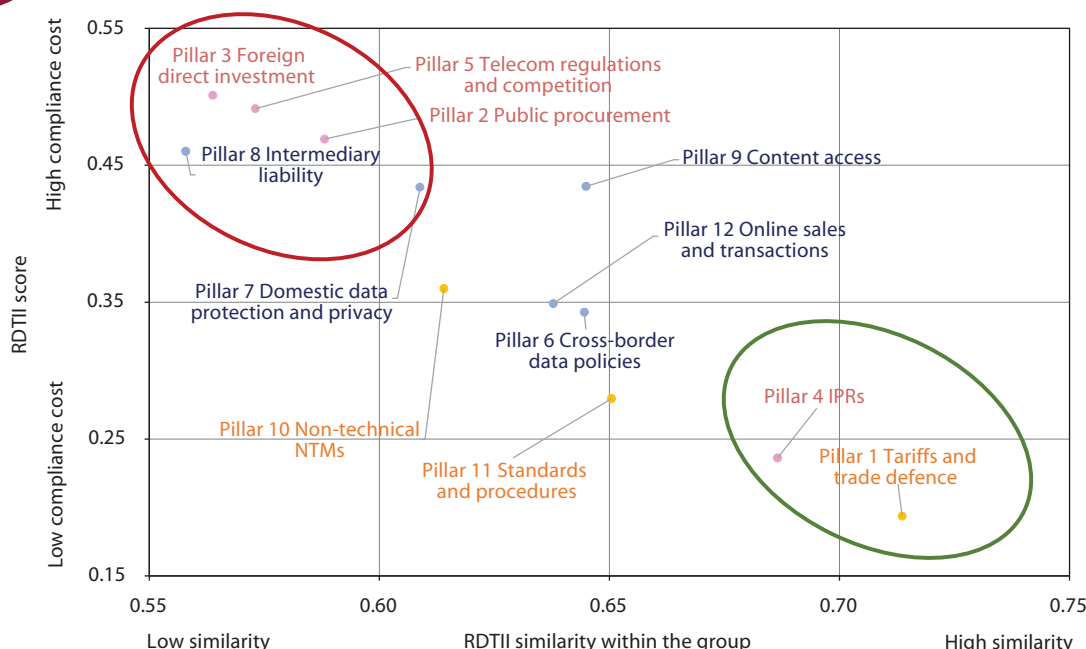
*“Asia-Pacific economies often adopt a dual strategy, combining a liberalization approach in traditional measures, and development of complex digital governance measures.”*

From a macro perspective, Asia-Pacific economies demonstrate a dualistic approach in their digital trade and investment policy formulation. This observation is confirmed by the ESCAP’s study, which utilized the RDTII framework as its basis (box 3.1). On one side, as shown in the bottom right of figure 3.1, policies related to tariff measures, trade facilitation mechanisms and intellectual property rights (IPR) are leaning towards regulatory simplification and regional regulatory harmonization. These developments are generally encouraging, because they tend to reduce costs of businesses participating in digital trade and promote competition.

Conversely, the policy areas highlighted in the upper left of figure 3.1 reveal a trend towards more stringent policies and varied rule sets. These areas include foreign investment regulations for digital services, regulations for telecommunication services, Government procurement policies and the digital governance framework. The latter comprises rules governing data transfers, online content, digital platforms, and e-transactions. It is worth noting that the oversight for many of these policy areas extends beyond the traditional scope of trade and investment ministries. This expansion underscores the need for a more interdisciplinary and comprehensive approach to regulation in digital trade and investment.

**Figure 3.1**

**Digital-trade policy landscape in the Asia-Pacific region, 2022**



Source: ESCAP, based on the Regional Digital Trade Integration Index (RDTII) database (<https://dtri.uneca.org/escap/home>).



### RDTII 2.0 framework in brief

The Regional Digital Trade Integration Index (RDTII) is a unified framework employed by three United Nations Regional Commissions – ESCAP, ECA and ECLAC – to analyse digital trade regulations in Asia-Pacific, Africa, and Latin America and the Caribbean.<sup>1</sup>

The index scores digital trade and investment policies from zero (low cost of compliance) to one (high cost of compliance). The current version of RDTII (RDTII 2.0) evaluates digital trade policies across 12 areas, which are grouped into three categories: traditional trade policies (tariffs, non-tariff measures, and ICT standards); other domestic regulations (public procurement, FDI, IP rights, and telecommunications regulations); and digital governance policies (data policies, privacy rules, intermediary liability, content access and online sales). A score greater than zero indicates that at least one of the following conditions occurs:

- Differential treatment between domestic and foreign providers;
- Additional regulatory compliance costs to services provided online, relative to those provided offline;
- Absence of certain international norms, e.g., international agreement, legislation or legal mechanisms considered to be important for interoperability across jurisdictions.

As of 2023, in the Asia-Pacific region, ESCAP's RDTII database holds data for 22 economies: Australia, Brunei Darussalam, Cambodia, China, India, Indonesia, Japan, Kazakhstan, the Republic of Korea, Lao People's Democratic Republic, Malaysia, Nepal, New Zealand, Pakistan, the Philippines, the Russian Federation, Singapore, Thailand, Türkiye, Vanuatu, Viet Nam and Hong Kong; China.

*“The regulatory landscape in the region is presenting challenges for small businesses.”*

The Regulatory Similarity Index, calculated using RDTII data, uncovers significant variations in the regulatory stances of Asia-Pacific economies. The variation in regulations across economies poses significant challenges, particularly by escalating compliance costs for cross-border business operations. This is especially true for smaller firms, which often lack the necessary resources or expertise to navigate complex regulatory landscapes.

*“Several Asia-Pacific economies are heading towards increased trade restrictiveness in digital services.”*

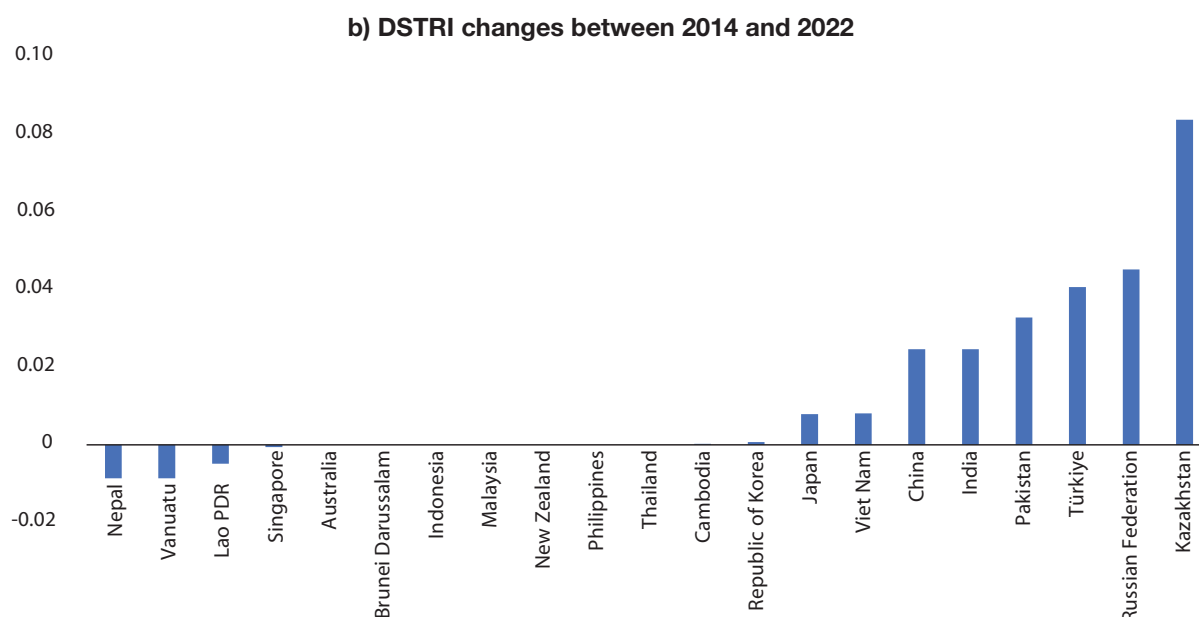
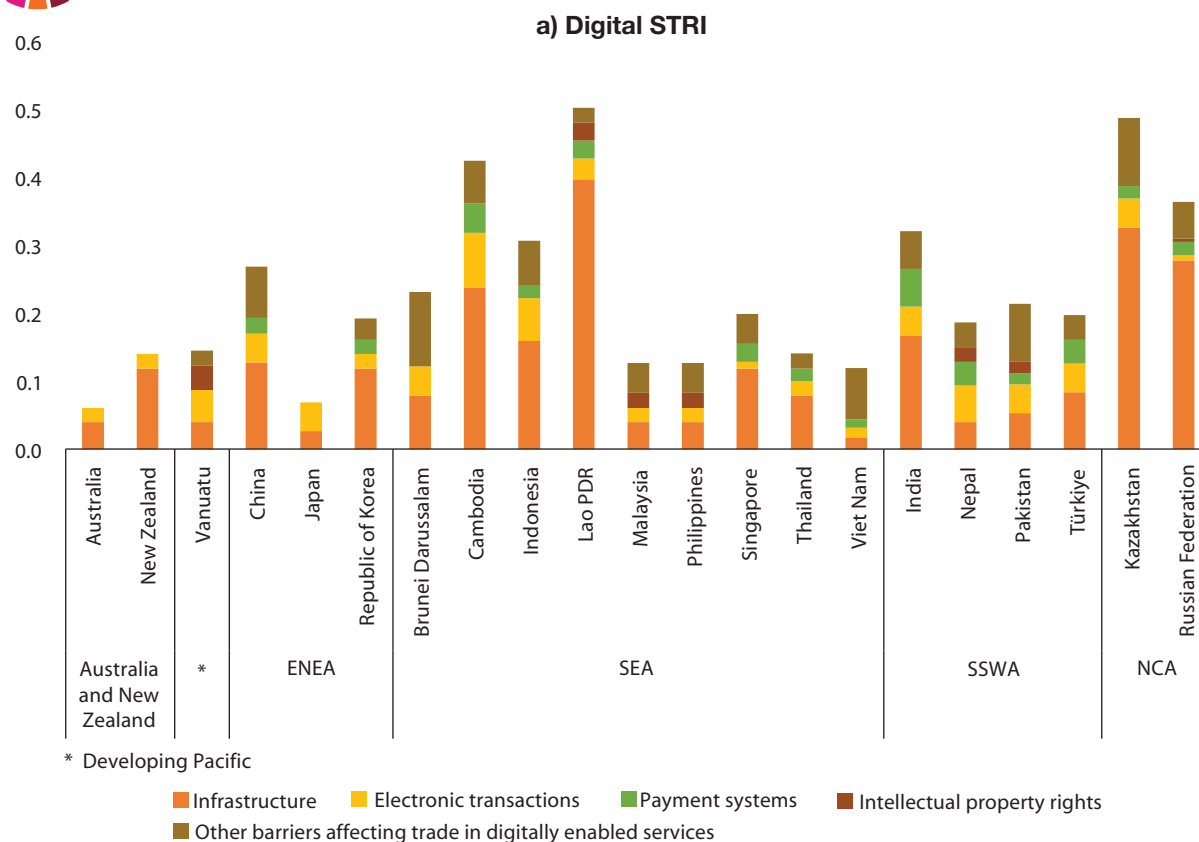
Specifically, the OECD Digital Services Trade Restrictiveness Index (DSTRI) shows that digital policy environment seems to be relatively enabling in advanced economies and in several South-East Asian economies (figure 3.2a). In LDCs, particularly Cambodia, the Lao People's Democratic Republic and Nepal, the policy restrictiveness is significant. However, the trend during 2014-2022 shows a gradual improvement in the Lao People's Democratic Republic and Nepal, similar also in Vanuatu (figure 3.2b). In contrast, several Asia-Pacific economies are heading towards increased trade restrictiveness in digital services. The index identifies Kazakhstan, the Russian Federation, Türkiye, Pakistan, and India as the top five countries showing an increase in digital services trade restrictiveness since 2014.

<sup>1</sup> For details, see ESCAP, ECA, and ECLAC, 2022 and the RDTII database (<https://dtri.uneca.org/escap/home>).



**Figure  
3.2**

### Digital services trade restrictiveness in the Asia-Pacific region, 2014-2022



Source: ESCAP based on OECD DSTRI database (<https://sim.oecd.org/Default.ashx?lang=En&ndds=DGSTRI>).

Note: The DSTRI score of zero indicates an open regulatory environment for digitally enabled trade and 1 indicates a completely closed regime. The negative percentage reflects restrictive regulatory development, and the positive percentage reflects the liberalized regulatory development.

## 2. POLICIES AFFECTING INFRASTRUCTURE AND COST OF ACCESS

*“Increased competition typically results in more affordable access fees and provides a broader range of choices for users.”*

Digital connectivity fundamentally depends on the availability of ICT infrastructure and equipment. In addition to these two factors, other elements such as regulatory policies and the level of competition among service providers are also important. These factors can be influenced by trade and investment policies. For example, trade barriers on ICT equipment can escalate the costs of obtaining and maintaining the necessary devices. These high costs can negatively impact essential services that rely heavily on digital tools, such as digital healthcare, online education, and digital finance. They also present additional challenges for marginalized groups in accessing these essential services. An effective strategy to counter these challenges is the promotion of competition. Increased competition generally leads to more affordable access fees and fosters a wider range of choices for users (World Bank, 2016).

### 2.1 Telecommunications regulations

The conducive domestic telecommunications regulations enable greater competition in the market by facilitating new entrants to participate in the market, encouraging innovation, and stimulating investments in service quality by existing operators. This ultimately benefits consumers through improved coverage and competitive pricing.

Competition in the telecommunications market can be cultivated by privatization, a process that include measures designed to promote private investment and strengthen the independence of regulatory bodies in the telecommunications sector. Measures that exemplify this approach include mandating infrastructure sharing, ensuring efficient spectrum

management, and diminishing barriers on imports of ICT goods and services. For example, the Republic of Korea’s major mobile operators – SK Telecom, KT and LG Uplus – have agreed to share 5G networks in 131 remote areas. This agreement allows a user to access networks provided by other carriers in regions not covered by their own.

*“The WTO Telecommunications Reference Paper offers comprehensive guidelines for a pro-competitive regulatory environment.”*

The WTO Basic Telecommunications Services Agreement acts as a guiding framework for opening telecommunications markets.<sup>2</sup> Specifically, the WTO Telecom Reference Paper has been established to ensure a pro-competitive regulatory environment. The paper is legally binding to the committed parties and encompasses six regulatory guidelines, covering competitive safeguards, interconnection, universal services obligation, public availability of licensing criteria, independent regulators, and allocation and use of scarce resources (WTO, n.d.). As of 2023, thirty three out of 38 Asia-Pacific economies that are WTO members have committed to the Paper.<sup>3</sup>

*“From 2007 to 2022, there was a significant improvement in the telecom regulatory landscape across the Asia-Pacific region. However, many LDCs, LLDCs, and PIDEs remain entrenched in State monopolies.”*

From 2007 to 2022, the telecom regulatory landscape in the Asia-Pacific improved significantly. Relying on the ITU’s regulatory maturity index, which measures criteria such as the establishment of an independent regulatory entity, the stipulated regulatory mandate, prevailing regime, and competition architecture,<sup>4</sup> the region’s average score increased from 36% in 2007 to 64% in 2022. However, in many LDCs, LLDCs, and PIDEs, state monopolies continue to dominate the telecommunications market.

<sup>2</sup> The Basic Telecommunication Services Agreement, the first international agreement on the liberalization of telecom services, was concluded in 1997 and formally entered into force in 1998. The basic telecommunications services refer to all telecommunication services, both public and private, that involves end-to-end transmission of customer supplier information, such as voice telephone services, and satellite-based mobile services. Following the basic telecom services, the negotiation expands to value-added telecommunication services, referring to suppliers “add value” to customer’s information. For more information, see [https://www.wto.org/english/news\\_e/pres97\\_e/summary.htm](https://www.wto.org/english/news_e/pres97_e/summary.htm) and [https://www.wto.org/english/tratop\\_e/serv\\_e/telecom\\_e/telecom\\_coverage\\_e.htm](https://www.wto.org/english/tratop_e/serv_e/telecom_e/telecom_coverage_e.htm)

<sup>3</sup> The five member States that are not taking part in the Telecommunications Reference Paper are Fiji, Maldives, Myanmar, Solomon Islands, and Macao; China.

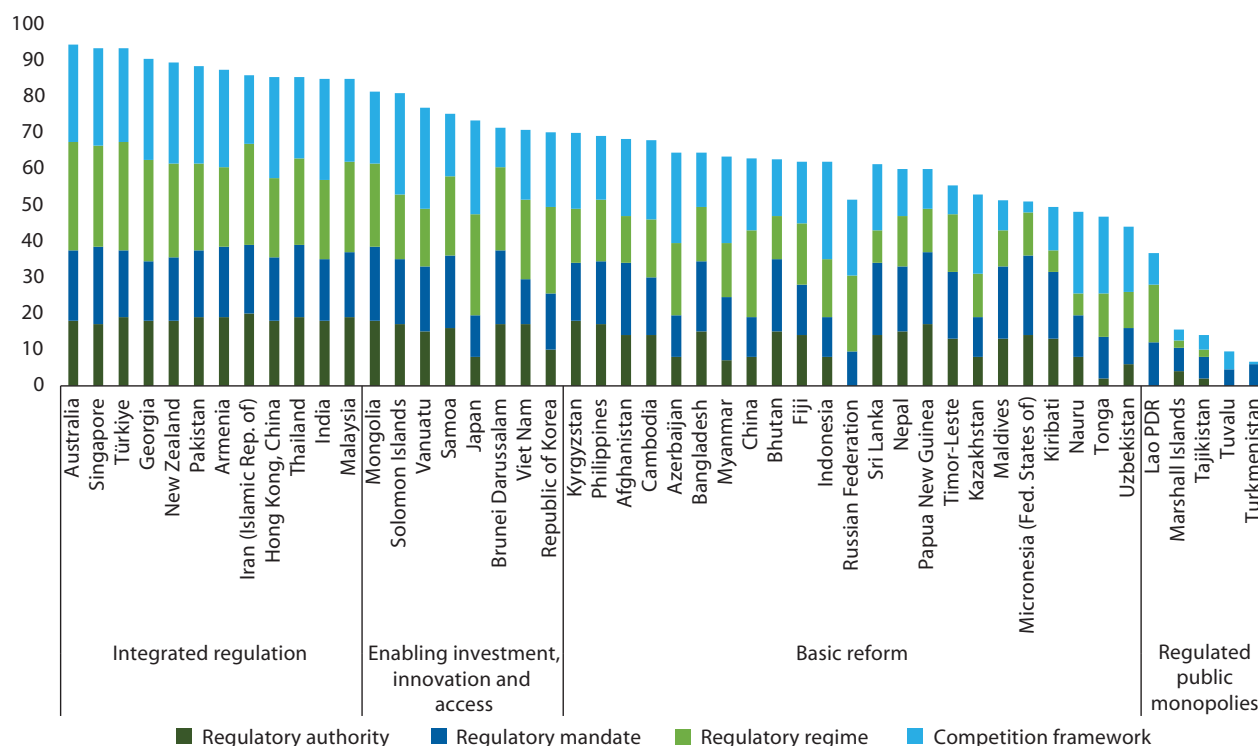
<sup>4</sup> For details and criteria of the the ITU’s telecommunications regulatory maturity index, see ITU, 2020.

A detailed exploration reveals pronounced disparities in the ICT regulatory environment across Asia-Pacific economies (figure 3.3). In 2022, Australia, Singapore, Türkiye, Georgia, and New Zealand were among the top performers in the ICT regulatory maturity index of the ITU. In contrast, Turkmenistan, Tuvalu,

Tajikistan, Marshall Islands, and Lao PDR are located at the other end of the regulatory spectrum, predominantly characterized by their state monopoly structures. This is compounded by the lack of an independent regulatory authority and essential measures to regulate anti-competitive practices.



**ICT Regulatory maturity index by Asia-Pacific economies, 2022**



Source: ESCAP, based on ITU ICT Regulatory Tracker (<https://app.gen5.digital/tracker/metrics>) (accessed September 2023).

Note: The ICT Regulatory Tracker evaluates the maturity of national legal frameworks with scores ranging from 0 to 100. A score of 0 signifies an environment dominated by public monopolies. Scores between 40 and 70 indicate countries that have undergone basic reforms, while scores between 70 and 85 represent environments with integrated regulation. Specifically, within the 70-85 range, the ITU identifies the presence of both telecom and digital regulatory frameworks adhering to best practice.

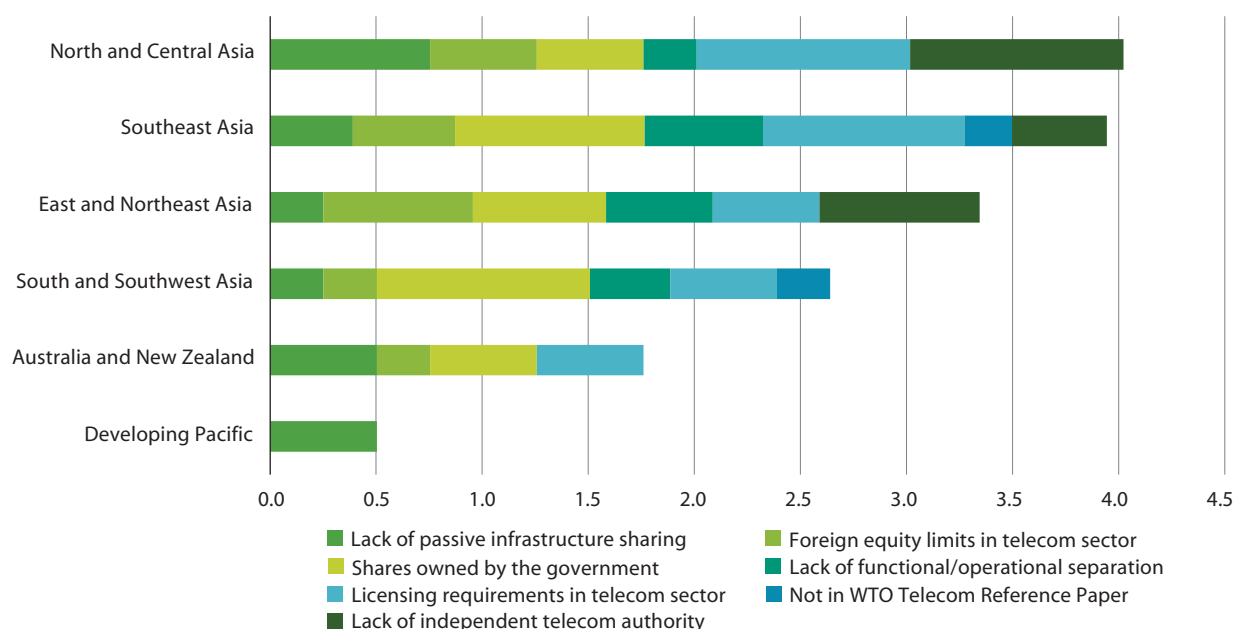
Similarly, from the ESCAP's RDTII database, of the 22 Asia-Pacific economies surveyed, 80% have their telecommunications sectors predominantly governed by state entities. For example, VNPT, Viettel, and Mobifone together account for over 90% of the market share in Viet Nam.

Furthermore, business licenses and registrations in telecommunications services frequently include nationality and residency prerequisites. These requirements are particularly pronounced in the economies of North and Central Asia, as well as in some areas of South-East Asia, and East and North-East Asia (figure 3.4).





Indicators of telecom policies in the Asia-Pacific region, 2022



Source: ESCAP, based on the RDTII database. See <https://dtri.uneca.org/escap/home>.

## 2.2 Digital infrastructure FDI policies

*“FDI policies related to digital infrastructure are generally encouraging.”*

Digital infrastructure encompasses transmission hardware, data generation and reception hardware, and data storage and processing hardware (ESCAP, 2023a, p.9). In the Asia-Pacific region, recent advancements in FDI policies related to digital infrastructure are generally encouraging:

- Many Asia-Pacific economies are easing ownership requirements to facilitate digital infrastructure investments.** Notably, the Philippines and India have made significant leaps, now allowing 100% foreign ownership, up from their previous caps. India further simplifies its FDI approach in telecommunications by favouring an automatic process over adhoc approvals. Bangladesh and Myanmar permit foreign entities to establish broadband networks (ITU, 2019; UNCTAD, 2021a).
- To attract more investment in digital infrastructure many Asia-Pacific economies extend fiscal incentives.** For example, Malaysia encourages collaborations with foreign partners and offers a 10-year tax break to foreign investors in digital infrastructure (Malaysia, 2022). Similarly, Thailand grants an eight-year tax holiday for investments in submarine cables and data centres (Thailand, 2021). Meanwhile, the Republic of Korea adjusted its tax structure to promote cutting-edge technology adoption by digital firms (Broadband Commission, 2021). These incentives not only attract investments but also channel funds into upgrading infrastructure and adopting advanced technologies (ESCAP, 2023);
- Establishment of regulatory bodies.** Countries, including Azerbaijan, Armenia, China, Myanmar and Viet Nam, have set up national competition authorities to streamline and improve oversight of incoming investments and transactions (ITU, 2023). Strengthening the legal infrastructure can potentially enhance investor confidence, thereby making digital sectors more enticing for foreign investments.

## 2.3 Tariffs and non-tariff measures

While many Asia-Pacific economies have moved towards lowering tariffs on ICT goods, there remains a significant variation across the region. With an average regional tariff of 9.5% in 2022, tariffs on ICT goods range from zero per cent in Singapore and Hong Kong; China, to more than 17% in the Maldives (figure 3.5a). Besides, trade defence measures often target ICT goods and services. More than 30% of the surveyed economies implement antidumping, safeguards, and countervailing duties. Moreover, 27% of these economies have outright bans on specific ICT goods or services, a trend that is particularly prevalent in South and South-West Asia (figure 3.5b).

health or the environment, amongst others, the compliance cost becomes significant when they deviate from international standards. However, economies increasingly adopt good practices for NTM. These practices include allowing foreign businesses to participate in technical standard-setting consultations and aligning their standards with those established by the recognized organizations (ESCAP, ECA, ECLAC, 2023). Examples include Malaysia's adoption of ITU standards for managing human exposure to electronic magnetic fields (EMFs) emitted by telecommunications equipment, and the Philippines's implementation of ITU-T Recommendations as part of the national telecom policy.

*"Trade in ICT products is frequently subjected to non-tariff measures (NTMs). The compliance cost becomes significant when they deviate from international standards."*

*"Adopting international standards, streamlining business approval processes, and implementing WTO ITA and TRIMS agreements are essential for efficient and cost effective digital connectivity."*

Trade in ICT products is frequently subjected to non-tariff measures (NTMs), including varying licensing, certification and labelling standards (figure 3.5c). While these measures are intended to protect public

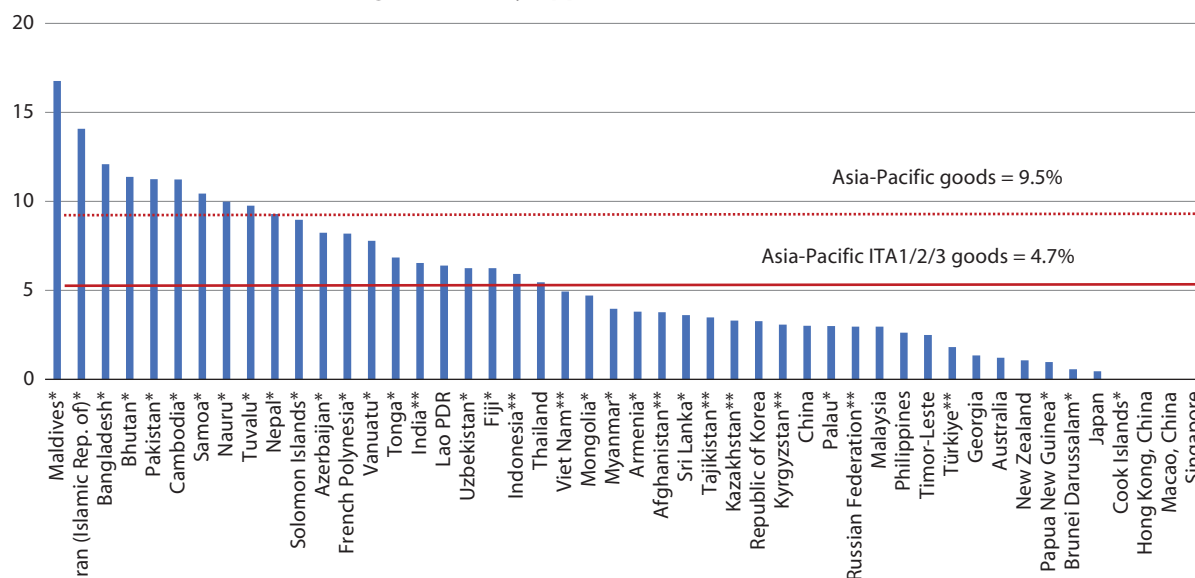
Adopting international standards, streamlining business approval processes, and implementing the WTO Information Technology Agreement and the WTO Agreement on Trade-Related Investment

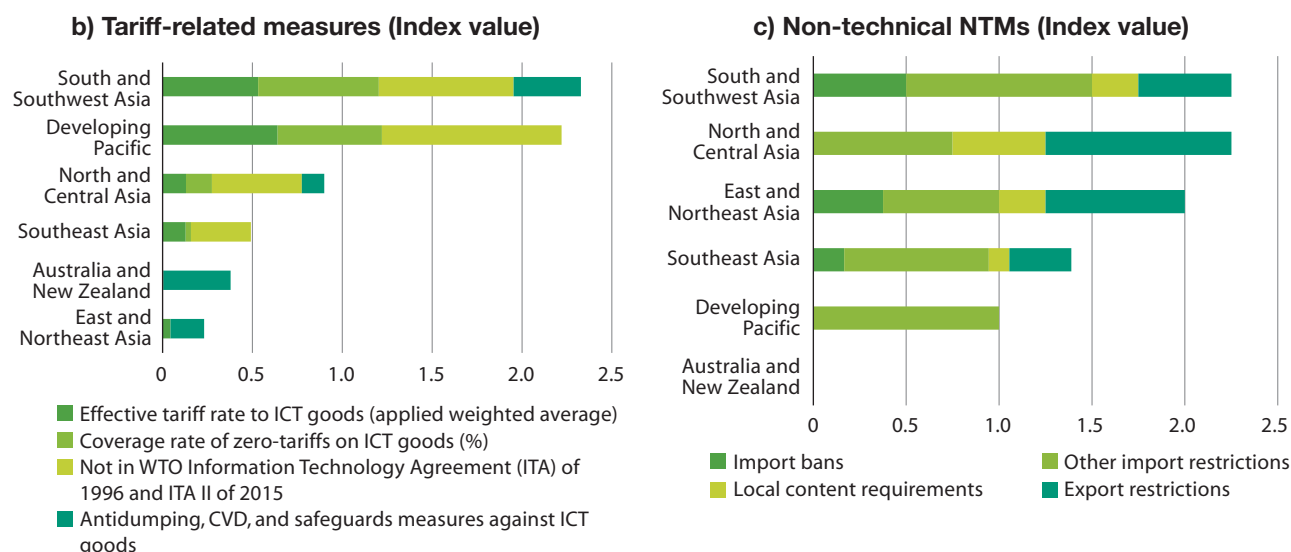


**Figure 3.5** Indicators of policies affecting digital infrastructure and cost access in the Asia-Pacific region, 2022

### a) Average tariffs on ICT goods

#### Average Effectively Applied Tariff of ITA1/2/3 (Per cent)





Sources: ESCAP, based on the RDTII database (<https://dtri.uneca.org/escap/home>) and UNCTAD TRAINS database (<https://trainsonline.unctad.org/home>) (accessed May 2023).

Note: \* Refers to economies not signing the ITA I, and \*\* refers to economies signing ITA I but not the ITA II expansion.

Measures (TRIMs) are essential to boost digital connectivity. Furthermore, active participation in forums for regional and global dialogues on ICT standards is instrumental in facilitating the harmonization of technical standards in the ICT sector. For example, the Global System for Mobile Communications Association (GSMA) working group provides platforms for discussion, delving into mobile ecosystem subjects such as 5G, AI, Blockchain, SIM, IoT, and network security (GSMA, n.d.).

To address the delays and complexities in the business approval process, some economies have adopted electronic processes for securing the necessary approvals and permits for imports and exports. For example, Bangladesh's One Stop Service (OSS) initiative allows both domestic and foreign businesses, as well as individuals, to submit essential documents via an automated OSS portal.<sup>5</sup>

Moreover, there exists potential for Asia-Pacific economies to further strengthen their commitments and implementation of WTO agreements, aimed at

eliminating trade and investment barriers in the ICT sector. For example, a considerable number of Asia-Pacific economies have not participated in the WTO ITA. Of 22 economies covered in the RDTII database,<sup>6</sup> 23% have not joined ITA I and 50% have abstained from participating in ITA II. Furthermore, about one-fifth of these economies enforce Local Content Requirements (LCRs) for ICT goods or services, a position that contradicts the WTO Agreement on TRIMs. For example, Indonesia mandates a minimum of 35% LCRs for 4G and 5G devices to bolster its domestic telecommunication industry (Limenta and Ing, 2022; Kominfo, 2021).<sup>7</sup>

### 3. POLICIES AFFECTING COSTS AND TRUST IN DIGITAL TRADE

A robust legal and regulatory framework is crucial to building confidence among stakeholders. It ensures that online transactions are safe, delivered goods and services meet consumers' expectations, and data is protected against misuse.

<sup>5</sup> See <https://beza.gov.bd/investing-in-zones/one-stop-service/>

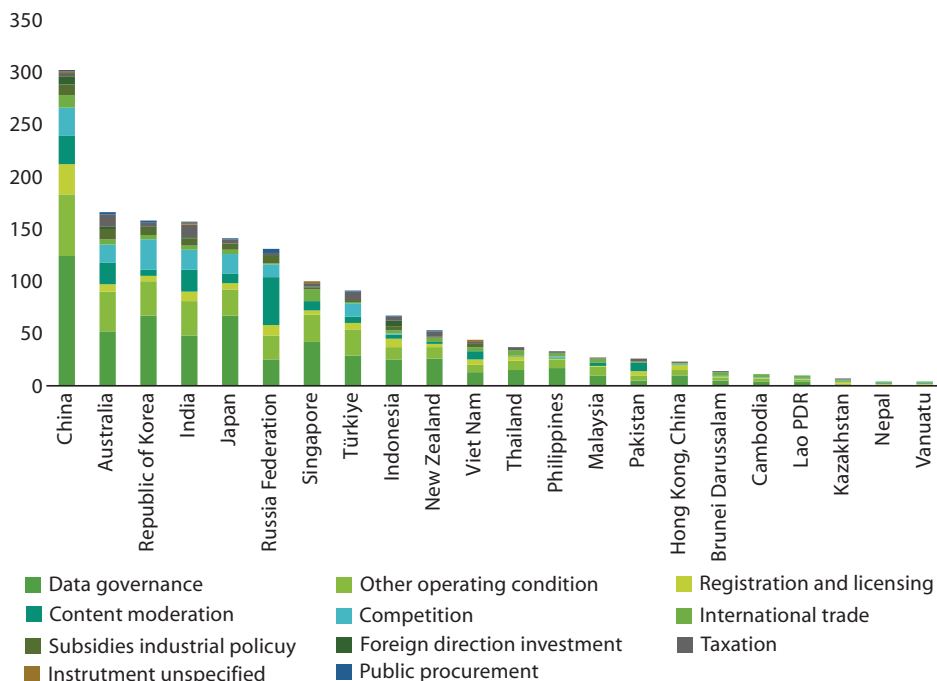
<sup>6</sup> In reference to Asia-Pacific economies examined under the RDTII and DSTRI indices, this pertains to the 22 Asia-Pacific economies for which data are available in ESCAP's RDTII database and OECD's DSTRI database. For a detailed list of the 22 Asia-Pacific economies, see box 3.1 in this chapter.

<sup>7</sup> For official documents, please see Indonesia's Ministry of Communication and Information Technology (MOCI) Regulation No.13/2021 in effect since 1 April 2022.



The number of digital policies adopted since January 2020 in Asia-Pacific economies

Number of measures



Source: ESCAP, based on the Digital Policy Alert (DPA) (<https://digitalpolicyalert.org/>).

Note: The DPA database specializes in tracking digital policy advancements in G20 countries. While it offers important information on certain non-G20 nations, the policy coverage for these countries is generally less exhaustive.

*“Since January 2020, Asia-Pacific economies have introduced a significant number of measures affecting digital trade and online activities.”*

Recognizing these necessities, since January 2020, Asia-Pacific economies have introduced a significant number of measures affecting digital trade and online activities. China is leading the regional trend (figure 3.6). New regulations in digital trade areas are primarily focused on aspects of digital governance, including data protection, online content moderation, competition, and the operational conditions of digital businesses.

Having outlined the general tendency of new regulations, the following subsections will delve into how existing and new regulations influence the cost and trust in digital trade in more detail.

### 3.1 Digital trade and investment facilitation

*“Streamlined trade procedures are pivotal for cross-border e-commerce, especially in B2C and C2C sectors that frequently handle small-value shipments.”*

Reducing digital trade costs is partly achieved by streamlining trade procedures for cross-border e-commerce. Specifically, B2C and C2C e-commerce are especially sensitive to trade procedural costs due to the high volume of small-value shipments they encompass. Transitioning from paper based methods to electronic trade procedures can greatly enhance accessibility, speed up processes, and promote environmental sustainability (ESCAP 2014; Duval and Hardy, 2021). To bolster this digital shift, e-contracts, e-signatures, and e-payments must be given the same legal effects as traditional methods (WTO,

ESCAP, and UNCITRAL, 2022). Alongside that, implementing a Single Window system – a unified portal for submitting standardized information and documents to meet regulatory criteria – trade can further optimize efficiency in a digitized trade landscape.

*“Regional progress in cross-border paperless trade is slow. PIDEs and SSWA economies, in particular, lag behind other subregions.”*

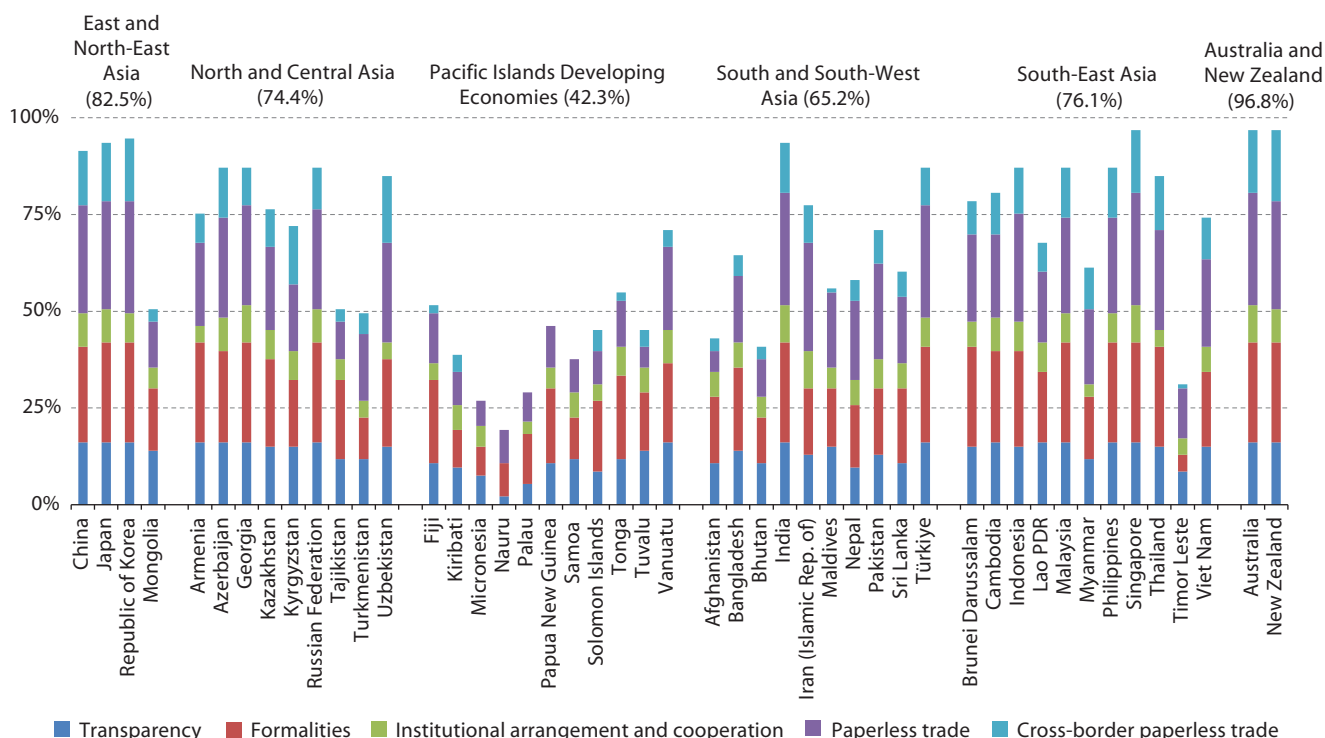
In this context, the Asia-Pacific region has made progress in implementing trade facilitation measures, particularly after the COVID-19 pandemic and subsequent supply chain disruptions. The implementation of paperless trade and cross-border paperless trade has increased by 10 percentage points (from 56% to 66%) and approximately 11 percentage points (from 31% to 42%),

respectively between 2019 and 2023.<sup>8</sup> More than 80% of the Asia-Pacific economies have developed e-transactions laws (UNCTAD, 2021b) and 70% have established electronic Single Window in 2021 (ESCAP, 2021). However, regional progress in cross-border paperless trade is slow. PIDEs and SSWA economies, in particular, lag behind other subregions (ESCAP, forthcoming) (figure 3.7).

Notably, establishing an effective paperless system for cross-border digital trade demands interoperable technical and legal frameworks among economies. However, the varied requirements of regional economies regarding digital transactions pose significant challenges, especially with the frequent absence of mutual recognition. Divergent rules between economies can incur additional costs, which may be an especially burdensome form for MSMEs to handle. Some important elements for policy include:

**Figure 3.7**

**Asia-Pacific implementation rate of trade facilitation measures<sup>9</sup>**



Source: ESCAP, based on Digital and sustainable trade facilitation in Asia and the Pacific 2023 (forthcoming).

<sup>8</sup> The ESCAP survey covered 46 Asia-Pacific economies in 2019 and 47 Asia-Pacific economies in 2023.

<sup>9</sup> The ESCAP 2023 survey classified 60 trade facilitation measures into four groups, including General, Digital, Sustainable and Other Trade Facilitation measures. The Asia-Pacific average implementation of WTO TFA-related measures stands at 66.76%.

*“The varied requirements of regional economies regarding digital transactions pose significant challenges, especially with the frequent absence of mutual recognition.”*

- **Digital contract:** Based on the RDTII index, most of the 22 Asia-Pacific economies in dataset, except for Nepal, recognize the legal status of contracts performed through electronic means to be valid and legally binding. For example, online, clickwraps, shirk wrap contracts are enforceable in Singapore provided that they are validly made, and users have an opportunity to be aware of the terms of contract and indicate affirmative assent.
- **Digital signatures:**<sup>10</sup> This is an area where economies in the region tend to be substantially diverse. According to the OECD DSTRI data, all 22 surveyed economies have adopted different legal approaches to recognizing e-signatures methods. For example, Australia, New Zealand and Singapore adopt a flexible stance, allowing all electronic signatures if both parties concur, reducing cross-border friction. Conversely, Indonesia and Nepal follow a stricter approach, recognizing only specific e-signatures based on a prescribed methodology. From regulator perspectives, the latter approach ensures security of a transaction. However, arguably, such rigidity can stifle adoption of new e-signature technologies, create cross-border challenges, especially for MSMEs that are not physically present in a country (WEF, 2017). Aiming to strike a balance between flexibility and security, many Asia-Pacific economies use a hybrid format that combines the elements of both approaches.
- **Digital payments:** The availability of electronic payment options in the Asia-Pacific region varies, with LDCs and developing economies often having limited options (ESCAP, 2018). The OECD DSTRI indicates that 55% of the 22 Asia-Pacific economies have implemented measures restricting access to payment settlement methods. For example, some regulations require

e-payment services or online retailers to establish a local commercial presence, use sanctioned intermediaries, or transact in local currency for international settlements.

- **Digital identity:** As per the ITU G5 Index, 69% of the 36 Asia-Pacific economies surveyed have established digital identity frameworks.<sup>11</sup> The progress varies widely across the Asia-Pacific economies. Notably, economies, such as Brunei Darussalam, Indonesia, Malaysia, Singapore, and Thailand have achieved full digitalization of their foundational identity systems, whereas Cambodia and the Lao People’s Democratic Republic are still in the pilot stages (UNCTAD, 2020a). Moreover, each economy has adopted diverse methods of digital authentication, including smartcards, digital certificates, mobile phone numbers and biometric information.<sup>12</sup> The varied authentication mentions can lead to interoperability challenges for cross-border digital transactions.

*“A small number of Asia-Pacific economies participate in the CPTA, underlining the opportunity to better leveraging of existing agreements for enhancing digital trade.”*

To enhance cross-border e-commerce facilitation, it is essential to prioritize the full implementation of the WTO Trade Facilitation Agreement (TFA), and regional frameworks such as the Framework Agreement on Cross-border Paperless Trade in Asia and the Pacific (CPTA). In addition to these agreements, a suit of legislative texts has been established to facilitate electronic commerce, for example, the UNCITRAL Model Law on Electronic Transferable Records (MLETR) 2017 and the Model Law on the Use and Cross-border Recognition of Identity Management and Trust Services 2022 (box 3.2). Nevertheless, only a small number of Asia-Pacific economies participate in the CPTA and United Nations Convention on the Use of Electronic Communications in International Contracts (ECC), underlining the opportunity to better leverage existing agreements for enhancing cross-border e-commerce and other digital trade modalities (figure 3.8).

<sup>10</sup> A digital signature, or advanced e-signature, uses cryptography to turn signed information into an unreadable format and then decodes it for the recipient.

<sup>11</sup> The ITU G5 Benchmark tracks how conducive policy, regulatory and governance frameworks for the digital transformation. It covers 48 Asia-Pacific economies. For digital identity measure framework, there are 36 Asia-Pacific surveyed economies.

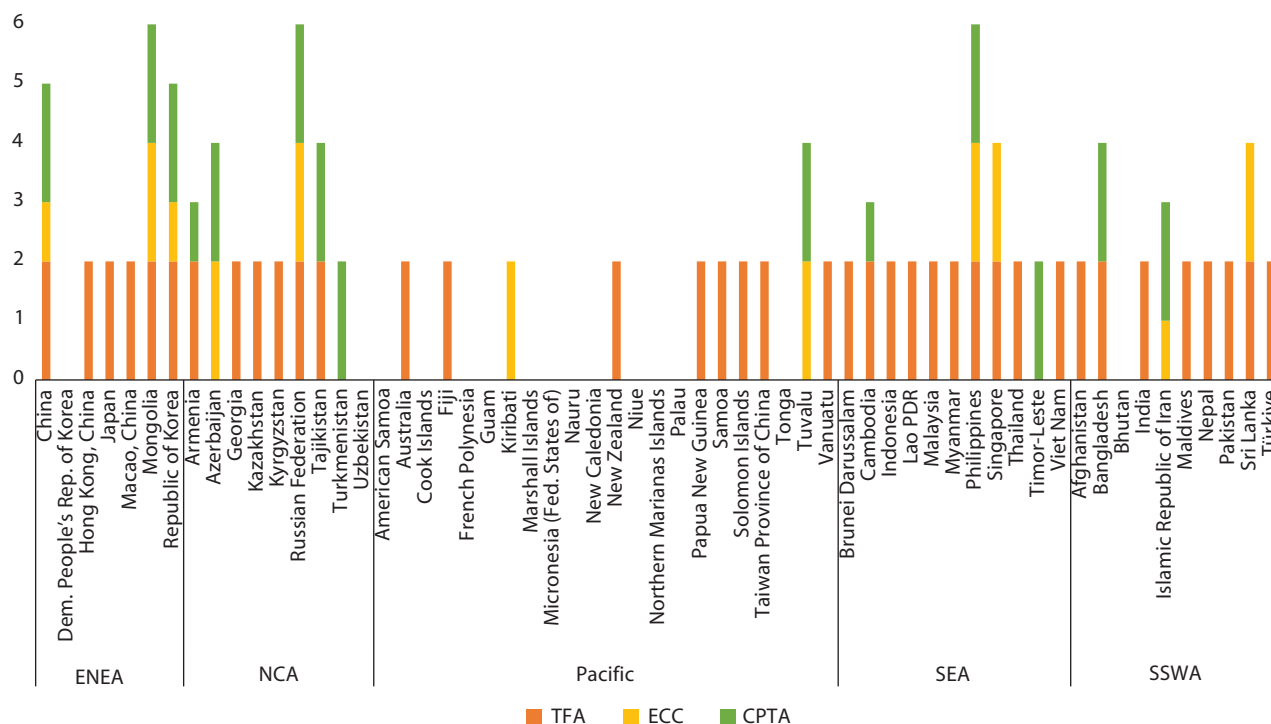
<sup>12</sup> Digital authentication is the process used to verify individuals, validate a person’s authority or ensure the integrity of information.





**Figure  
3.8**

### Participation in TFA, ECC, and CPTA in the Asia-Pacific region, 2023



Sources: ESCAP, based on WTO Trade Facilitation Agreement website ([https://www.wto.org/english/tratop\\_e/tradfa\\_e/tradfa\\_agreeacc\\_e.htm](https://www.wto.org/english/tratop_e/tradfa_e/tradfa_agreeacc_e.htm)), the UNCITRAL website ([https://uncitral.un.org/en/texts/ecommerce/conventions/electronic\\_communications/status](https://uncitral.un.org/en/texts/ecommerce/conventions/electronic_communications/status)), and the United Nations Treaty Collection ([https://treaties.un.org/Pages/Treaties.aspx?id=10&subid=Aandclang=\\_en](https://treaties.un.org/Pages/Treaties.aspx?id=10&subid=Aandclang=_en)) (accessed September 2023).

Note: The score of 2 refers to ratification, acceptance, approval, and accession to these international frameworks. The score of 1 refers to signatory to these international frameworks. The score of zero refers to participate to these international frameworks.



**Box  
3.2**

### International guidelines for trade facilitation

The WTO TFA covers provisions for expediting the movement, release and clearance of goods as well as promoting the use of electronic formats. Regionally, the CPTA holds significant potential for to complement the WTO TFA, and subregional efforts foster digital trade facilitation by enabling exchange and mutual recognition of electronic trade-related data and documents, and facilitating interoperability for single windows and other paperless trade systems, promoting economic integration and trade facilitation. Notably, fully implemented the WTO FTA is estimated to reduce trade costs by 14.3% on average (WTO, 2015), while the full participation of the CPTA could potentially lower trade costs by 10% to 30%, depending on the current state of paperless trade development (ESCAP, n.d.).

UNCITRAL Model Law on Electronic Transferable Records (MLETR) 2017 and the Model Law on the Use and Cross-border Recognition of Identity Management and Trust Services (MLIT) 2022 serve as internationally acceptable guidelines for the drafting and amendment of domestic laws. The United Nations Convention on Electronic Communications in International Contracts (ECC) builds upon the existing model laws as a treaty aimed at ensuring legal validity and enforceability of electronically concluded contracts and other electronically exchanged communications.



Moreover, the WTO concluded negotiations on an investment facilitation for development agreement. A fundamental principle of this agreement encourages member states to digitize their investment approval processes. An example of a national initiative in this endeavor is Malaysia, which has launched an online investment facilitation platform. Through this platform, investors can submit various applications, from initial investment proposals to permits and incentive applications. Investors can monitor the progress of their submissions, and the platform is accessible to all pertinent ministries. Another noteworthy example, outside the Asia-Pacific region, is Croatia. Invest Croatia, the country's investment promotion agency, offers a digital incentives calculator on its website.<sup>13</sup> This tool promotes efficiency and transparency, giving both current and potential investors vital information.

### 3.2 Online consumer protection and cybersecurity

Regulations that build trust by ensuring online transaction security, product delivery assurance, and prevention of data misuse are essential. Online consumer concerns include the conditions for the sale, whether the goods or services purchased online will meet their expectations when they arrive, and whether they are entitled to any remedies if any problems arise during or after the transaction. Addressing these concerns requires comprehensive regulations that encompass every phase of an online transaction – from the pre-purchase stage, which includes advertising and information dissemination, to the purchase phase, covering contract terms and the security of online payments; and through to the post-purchase phase, addressing dispute resolution and redress mechanisms.

 *“The region has made progress in online consumer protection frameworks.”*


Encouraging developments in online consumer protection are emerging within the region. For example, in Pakistan, the nationwide biometric verification of subscriber identity module cards has improved payment security simplified the process of mobile banking (UNCTAD, 2017). In China, a third-party payment method, such as an escrow system, is employed to safeguard transaction security. This

system involves consumers depositing the due amount with a third party, who keeps it until the consumer receives the good without complaints (Yu, 2016). Significantly, the regional initiative – ASEAN Guidelines on Consumer Protection in E-commerce – offers comprehensive guidance to policymakers. This encompasses different stages of e-commerce transactions, including pre-contractual information disclosure, consumer safety and privacy during a transaction, confirmation of purchase and payment, and post-purchase dispute resolution and redress (ASEAN, 2022).

According to regulatory trackers of international organizations, such as UNCTAD, ITU and ESCAP, a considerable number of Asia-Pacific economies have issued consumer protection laws and cybersecurity laws (figure 3.9). For example, data from the ESCAP's RDTII database indicate that among the 22 surveyed economies, most have consumer protection laws relevant to e-commerce transactions. All these economies, except for Vanuatu, offer a comprehensive framework covering all sectors, typically via consumer protection and/or electronic transactions laws.

 *“Most Asia-Pacific economies have cybersecurity laws, but few align with international treaties.”*

Regarding cybersecurity, most Asia-Pacific economies have cybersecurity laws, but few align with international treaties. According to the RDTII, the majority of the 22 Asia-Pacific economies have enacted cybersecurity laws, with the exceptions being a few LDCs and some PIDEs. However, most of them are not parties to the Budapest Convention on Cybersecurity, which is an international treaty aimed at combating computer crimes by harmonizing national laws.

 *“Service trade regulations, especially those related to computer professional services, affect the availability of digital security expertise.”*

Moreover, service trade regulations, especially those related to computer professional services, affect the availability of digital security expertise. For example, Kazakhstan implements annual quotas for contractual service providers in relation to its total workforce. The findings from the OECD STRI on computer services show that of the 22 Asia-Pacific

<sup>13</sup> See <https://investcroatia.gov.hr/en/incentives-calculator/>

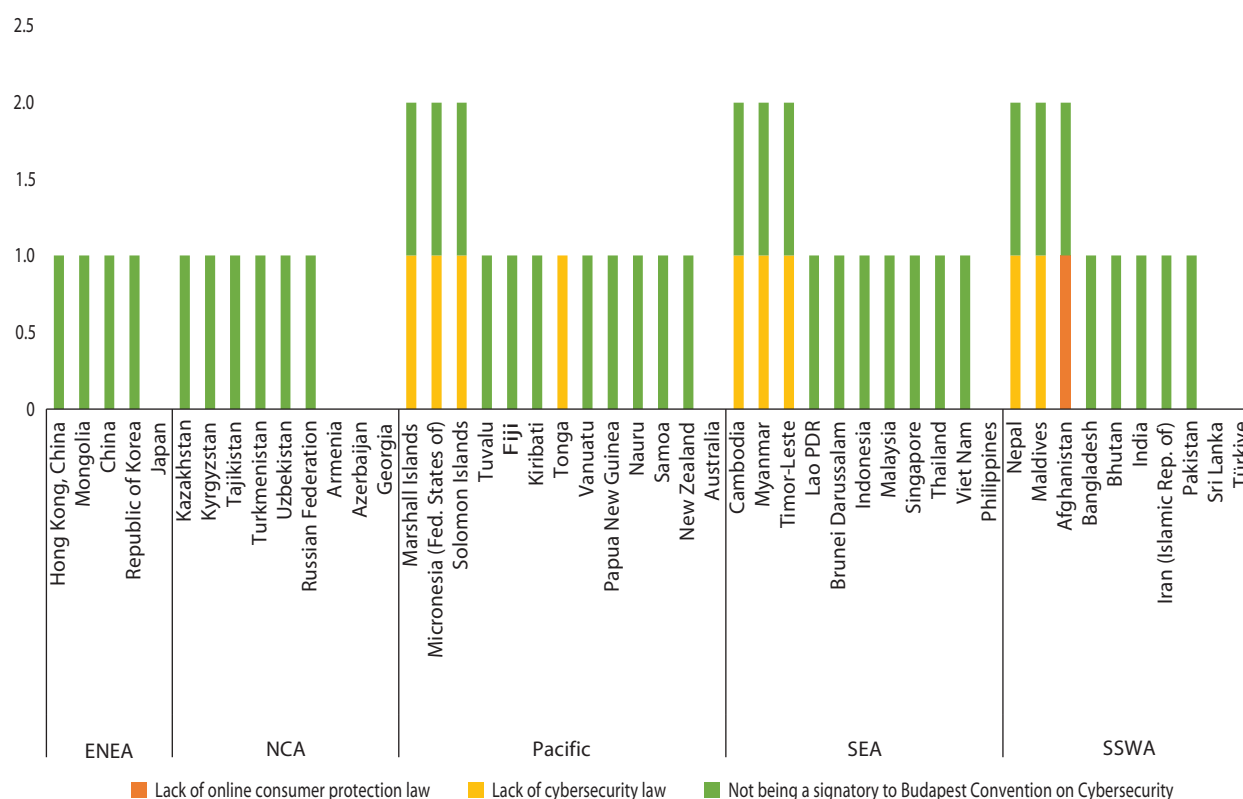
surveyed economies, foreign entry restriction is a substantial regulatory barrier in the computer service sector (43%), followed by restrictions to movement of people (33%) in 2021 (ESCAP and OECD, 2022).

*“Promising initiatives underway to establish cross-border dispute resolution frameworks, such as those of APEC and ASEAN.”*

In addition, it is essential to have effective mechanisms to address cross-border online transaction disputes. In the Asia-Pacific region, the dispute resolution mechanisms often fall short, especially concerning cross-border transactions. Nonetheless, there are promising initiatives underway to establish cross-border dispute resolution frameworks, such as those of APEC and ASEAN (box 3.3).



**Indicators of e-commerce policy issues in the Asia-Pacific region, 2022**



Sources: ESCAP, based on UNCTAD Global Cyber Law Tracker (<https://unctad.org/topic/e-commerce-and-digital-economy/e-commerce-law-reform/summary-adoption-e-commerce-legislation-worldwide>), the RDTII database (<https://dtri.uneca.org/escap/home>), and ITU G5 Benchmark (<https://app.gen5.digital/benchmark/metrics>) (accessed September 2023).

Note: According to the UNCTAD Global Cyber Law Tracker, online consumer protection laws are not found for the following economies: Armenia, Fiji, Georgia, Iran (Islamic Rep. of), Kiribati, Maldives, Marshall Islands, Micronesia (Fed. States of), Mongolia, Nauru, Pakistan, Papua New Guinea, Samoa, Solomon Islands, Tajikistan, Timor-Leste, Tonga, Turkmenistan, Tuvalu and Uzbekistan.



### Regional cooperation for cross-border online dispute resolution

**APEC Collaborative Framework for Online Dispute Resolution:** This framework has paved the way for the “APEC Procedural Rules for Online Dispute Resolution.” These procedural guidelines provide a clear direction for platforms and alternative dispute resolution centres to guide their implementation (APEC, 2019).

**ASEAN’s Strategic Action Plan for Consumer Protection (2016-2025):** This plan sets forth three core objectives: (1) The establishment of national online dispute resolution systems; (2) The development of a cohesive ASEAN network for online dispute resolution; and (3) The introduction of a mechanism tailored to manage cross-border complaints and investigations. In line with these objectives, the ASEAN Committee on Consumer Protection has crafted the “Guidelines on Consumer Protection in E-Commerce.” These guidelines are methodically designed, mapping out each phase of an e-commerce transaction. They encompass areas like pre-contractual information disclosure, ensuring consumer safety and privacy during transactions, confirmation of both purchase and payment as well as post-purchase dispute resolution and redress (ASEAN, 2022).

## 3.3 Data regulations



*“Effective regulatory practice involves facilitating data transfers, while simultaneously ensuring that consumers have confidence in the security and control of their personal information.”*

Proper data governance delineates rights for individuals concerning the use and protection of their data, while also assigning responsibilities to entities handling the data. These regulations shield individuals from potential misuse or breaches, foster trust in digital platforms, and consequently promote the growth of the digital economy. However, overly complex data flow regulations can place considerable burdens on cross-border businesses, especially MSMEs. Limitations on data flows can also affect the cost and wider accessibility to essential services such as e-payment, digital finance, smart logistics, digital health and e-education (see chapter 4 for further discussion). The sound regulatory practice is then to enable data transfers, while simultaneously ensuring that consumers have control of their personal information. China’s recent actions towards narrowing the scope of cross-border data transfer (CBDT) regulations has been positively received (box 3.4).

In the Asia-Pacific region, an increasing number of economies have established data protection frameworks with varying scopes (figure 3.10a). Developed economies typically possess comprehensive laws, while many emerging economies adopt sector-specific laws, especially in the banking and telecommunications sectors (ESCAP and OECD, 2022). While these discrete provisions are beneficial in their respective contexts, it can be challenging to balance the various priorities of data privacy protection.



*“Asia-Pacific economies have undertaken various forms of data protection measures.”*

Asia-Pacific economies have undertaken various forms of data protection measures. For example, Türkiye requires Internet payment services to store data locally. Viet Nam requires domestic and foreign telecommunication service providers, Internet service providers (ISPs), and value-added services in cyberspace to store all data locally.<sup>14</sup> The Reserve Bank of India has proposed requiring payment system operators to store data within the country. Developed countries are also implementing data localization measures. For example, Australia prevents health data to be transferred overseas.

<sup>14</sup> In Viet Nam, a recent Decree 53 also requires localization on personal data, account data and relationship data by all domestic firms providing telecoms services and online services to local customers as well as foreign firms engaging in the specified services.



### China's new draft regulations on cross-border data transfer

On 28 September 2023, the Cyberspace Administration of China (CAC) released a new set of draft regulations – the Regulations on Standardizing and Promoting Cross-Border Data Flows (draft for comment) – providing several allowances for the export of “important data” and personal information (PI) in certain scenarios, with the deadline for submitting comments being 15 October 2023 (China Law Translate, 2023). The draft regulation, if passed, would bring significant changes to the requirements for regulating the cross-border data transfer (CBDT) of China.

More specifically, the regulations contain 11 proposals to ease the CBDT compliance burden for companies (China, 2023), with the following implications considered the most important (Deloitte, 2023; Dong and others, 2023; OneTrust, 2023; Huld, 2023):

1. **Easing requirements for export of “important data” and PI.** The draft regulations provide that data generated in international trade, academic cooperation, transnational manufacturing and marketing, which does not contain PI or important data, are exempt from CBDT mechanisms including security assessment, PI protection certificate and standard contract;
2. **Facilitating CBDT for necessary transactions.** The regulations stipulate three specific scenarios in which the export of PI is deemed “necessary” and therefore are not subject to the three CBDT mechanisms. The three scenarios are: (1) where it is necessary for the performance of contract to which the data subject is a party to, (2) employee data cross-border transfers that are necessary for Human Resources (HR) management in accordance with legally formulated labour policies or collective employment contracts, and (3) cross-border data transfers that are necessary for protecting the health and property safety of a natural person in an emergency.
3. **Modifying security assessment threshold.** The regulations increase the thresholds of the volume of data that a company can export without the need to they need to undergo a certain CBDT mechanism. For example, while the current rules require a mandatory security assessment being done in the event the export involves more than 100,000 individuals’ data per year, the draft regulation raises this number to one million.
4. **Implementing the concept of a data “negative list” in free trade zones.** China’s free trade zones are allowed to formulate the list of certain types of data for which a company must undergo one of the CBDT mechanisms. Under this system, any data types that are not included in the list could be freely exported through the FTZs.

However, while the draft regulations seem to provide easing of the CBDT obligation, there are still unclear provisions that introduce uncertainty regarding the scope of the exemption (Kennedy and Woo, 2023). Moreover, as implementing the full scope of these transfers will take some time, businesses may find themselves in a challenging position, preparing to comply with uncertain regulations (Zhu and Warren, 2023). Despite this, the draft regulations are a welcomed move, and expected to substantially reduce the compliance burden for international companies doing business in China. Some experts expect that the final version of the draft regulations will soon be released after the public comment period (Zhu and Warren, 2023; Roberts and Ke, 2023). Until then, the current regulations, requiring implementation by 1 December 2023 for existing data transfers, remain in place.

According to the RDTII database, there are measures that encompass requirements for local storage (14% of the surveyed economies), local processing (55%), infrastructure obligations (14%) and conditional flow regime<sup>15</sup> (82%). Moreover, almost 70% of the 22 surveyed economies in the region prescribe minimum data retention periods. In addition, half of these economies necessitate Data Protection Impact Assessments (DPIA) or the appointment of Data Protection Officers (DPO). Notably, in most of these economies, the Government can access personal data without requiring a court order.

*“Stringent data regulations are particularly prevalent in North and Central Asia, followed by South and South-West Asia.”*

On average, stringent data regulations are particularly prevalent in North and Central Asia, followed by South and South-West Asia (figure 3.10b). For example, UNCTAD (2021c) indicated that the Russian

Federation adopts a security-oriented approach in shaping its regulatory model on cross-border data flows. The security-oriented approach also influences at a subregional level, particularly within the Eurasian Economic Union.

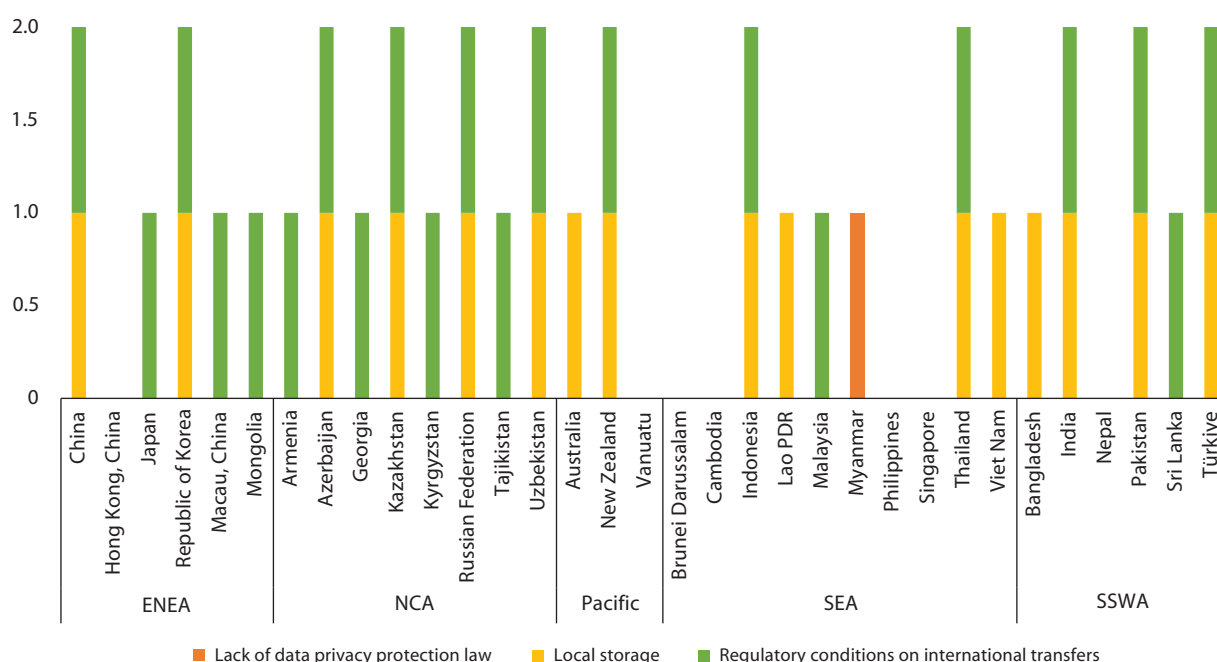
*“Different rules about data protection in various countries can slow down the growth of digital businesses.”*

Notably, in the Asia-Pacific region, while there is a shared foundation in data protection principles, the specific requirements in data regulations vary considerably across economies. For example, the mechanisms used for legal transfers of data differ, encompassing adequacy decisions, consents, various other legal grounds such as legal mandates, or even contractual agreements and binding corporate rules. From the OECD DSTRI, 57% of the 21 Asia-Pacific economies surveyed engage in cross-border data transfers of personal data to jurisdictions

**Figure 3.10**

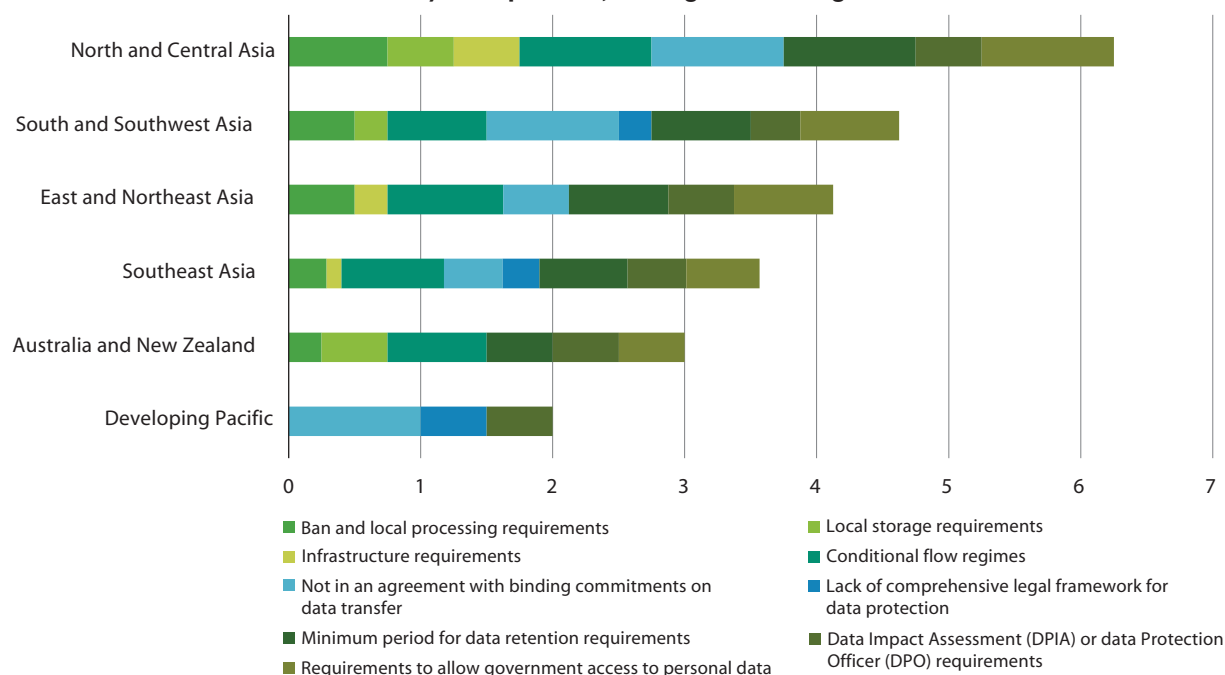
### Indicators of data policies in the Asia-Pacific region, 2022

#### a) Data protection, data localization and conditional data flow regimes



<sup>15</sup> Under a conditional flow regime, data cannot be transferred abroad unless certain conditions are fulfilled by the recipient country (WEF, 2019).

## b) Data policies, subregional average



Sources: ESCAP, based on UNCTAD Digital Economy Report 2021 Annex 2 – Annex to Chapter V, ([https://unctad.org/system/files/official-document/der2021\\_annex2\\_en.pdf](https://unctad.org/system/files/official-document/der2021_annex2_en.pdf)), the RDTII database (<https://dtri.uneca.org/escap/home>), and Onetrust Data Guidance (<https://www.dataguidance.com>) (accessed September 2023).

with comparable privacy safeguards. However, there is no clear list of economies countries considered to have adequate data protection, nor set standard rules for sharing data across borders.<sup>16</sup>

Different rules about data protection in various countries can slow down the growth of digital businesses. The need to navigate and adhere to these diverse data-transfer rules means businesses must invest in legal services and technology modifications tailored to each jurisdiction. The compliance costs stemming from the complexity of regulations might discourage numerous MSMEs from pursuing international expansion.

*“Regional and global initiatives are increasingly offering guiding principles for data regulation.”*

To tackle variations in data privacy and cybersecurity concerns, regional and global initiatives are increasingly offering guiding principles for data regulation. Many Preferential Trade Agreements (PTAs) in the region – for example, the CPTPP, RCEP,

Australia-Singapore Digital Economy Agreement and China-Republic of Korea Free Trade Agreement, have included data governance provision (for a comprehensive discussion, refer to chapter 5).

A notable framework is the Asia-Pacific Economic Cooperation (APEC) Privacy Framework. Building on this momentum, the Digital Economy Partnership Agreement (DEPA) was formulated. These regional initiatives accentuate the importance of international cooperation, especially concerning data governance. In addition, bilateral agreements ensuring equivalency of privacy regimes have been adopted, such as the European Union-Japan Mutual Adequacy Agreement. This Agreement provides smooth transfer of personal data between the parties without any additional contractual privacy specifications or safeguards (Slinn and others, 2023). In addition, the ASEAN Mutual Recognition Agreement (MRA) has the potential to serve as a mechanism for the ASEAN member States to mutually recognize privacy certifications for cross-border data protection (GSMA, 2018).

<sup>16</sup> For example, both New Zealand’s Privacy Act and Thailand’s Personal Data Protection Act stipulate that personal data should only be transferred to countries that offer similar protections. Yet, neither country has provided a specific list of jurisdictions that meet these protection standards.



*“A promising approach for addressing divergent data rules is for economies to harmonize their data regulations with established international standards, such as the ISO 27000.”*

A promising approach is for economies to harmonize their regulations with established international standards. The ISO 27000 series stands out as a particularly important tool. Specifically, the ISO 27001 delineates standards for ensuring data integrity, availability and restricting access solely to authorized personnel. In addition, the ISO 27701 focuses on the procedures an entity employs for collecting personal data, alongside mechanisms to prevent unauthorized disclosures or misuse. Singapore introduces a Data Protection Trustmark (DPTM), a voluntary enterprise-wide certification for organizations complying with these standards. DPTM signifies accountable data protection and reduces the risk of data breaches (Singapore, 2023a). Adopting such standardized benchmarks can pave the way for a more harmonized and trustworthy digital environment across borders.

### 3.4 Online platform regulations

*“Across the region, there are stringent rules governing online content and the responsibilities of platform providers.”*

Regulations concerning online content and intermediary liability affects e-commerce businesses, content providers, and individuals accessing information via the Internet. In Asia-Pacific economies, stringent rules governing online content and the responsibilities of platform providers are prevalent. Governments often regulate online access, using moral, political, or cultural reasons as justification (ESCAP, ECA, and ECLAC, 2022). For example, ISPs operating in Cambodia are required to install software programs equipped Internet

surveillance tools to filter and block social media accounts or pages with certain illegal content.

Often, Governments lack clear guidelines on intermediary liability, causing uncertainty for digital platforms like websites and apps, and their users or vendors, regarding shared responsibility for illegal content. Based on the 22 economies covered in the RDTII, half of them lack protections from online litigation for intermediaries, including e-commerce platforms, beyond copyright infringements (figure 3.11a). Furthermore, many surveyed economies have stringent regulations in the online content sector. For example, 27% of these economies mandate the utilization of local advertising services, among other restrictions. On average, North and Central Asia demonstrate a stronger inclination towards strict regulations for online platforms (figure 3.11b).

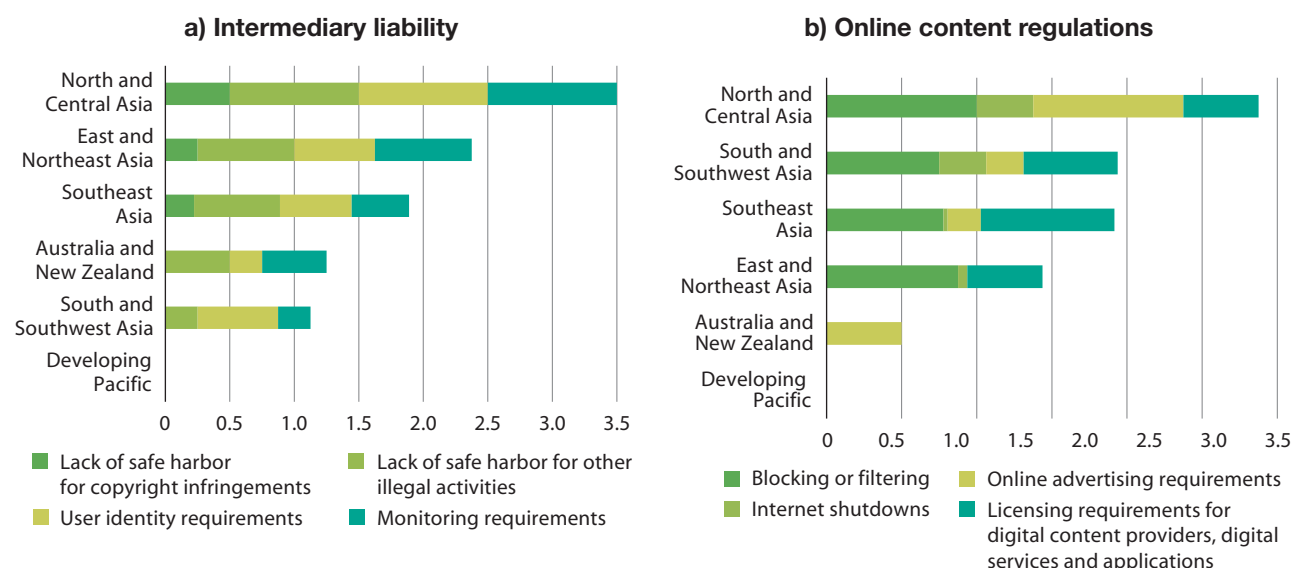
Furthermore, there are growing concerns about the unfair competition practices of major e-commerce platforms. In response, some Governments have implemented anti-monopoly regulations targeting these online marketplaces. India, for instance, has been notably proactive in this realm. The country has introduced competition policy measures intended to protect smaller sellers, and curtail potential abuses of platform market dominance. Specifically, e-commerce marketplace entities cannot source more than 25% of their products from a single seller. Furthermore, firms that have equity ties with marketplace entities cannot sell their items on the said platform. On top of this, these entities must annually report compliance to the Reserve Bank of India (UNCTAD, 2019). In addition, Indonesia rolled out new rules targeting social media platforms. Under these regulations, such platforms are limited to advertising products and are barred from conducting direct e-commerce sales. Moreover, when it comes to cross border e-commerce, there's a stipulated minimum price of US\$ 100 per unit FOB for goods directly imported into Indonesia.<sup>17</sup>

<sup>17</sup> Regulation No. 31 of 2023, effective from 26 September 2023.





**Indicators of online platform regulations in the Asia-Pacific region, 2022**



Source: ESCAP, based on the RDTII database (<https://dtri.uneca.org/escap/home>) (accessed May 2023).

### 3.5 Investment regulations

*“A lack of clarity and increasing fragmentation in investment policy formulation is observed.”*

As illustrated in figure 3.2, FDI policy measures are among the most intricate facets of digital policies in the Asia-Pacific region. Two major trends shape the FDI policy dynamics both in the Asia-Pacific region and globally. First, there is a lack of clarity and increasing fragmentation in policy formulation. This is largely due to the peripheral role of specialized investment promotion agencies (IPAs) in the decision-making process (OECD, 2021). As a result, broader ministries, often lacking specific expertise, primarily dictate these policies. Second, due to factors such as developmental differences, cultural and security issues, many Governments have intensified their inward FDI screening processes. These measures aim to mitigate risks associated with foreign control, evolving innovation environments and potential misuse of personal data (Chaisse, 2023).

*“Extensive measures are especially pronounced in Southeast Asia.”*

Frequently, these measures take the form of requirements that companies must meet to obtain licences and business registration. These policies usually form part of wider domestic efforts aimed at regulating the digital industry, sometimes covering several sectors.

In many Asia-Pacific economies, current regulatory environment risk-reducing competition concerning e-commerce and online services. Data from the RDTII reveals that 77% of surveyed economies set limits on foreign ownership in sectors related to digital trade, apart from e-commerce and telecom. Meanwhile, 23% set limits on foreign ownership in e-commerce businesses. Another 27% require a local presence for digital service providers. Moreover, 64% of these economies demand licensing for digital content providers, online services and apps, even if these are remotely offered. Extensive measures are especially pronounced in Southeast Asia (figure 3.12a).

*“In major developing economies, FDI in digital businesses is characterized by stringent ownership, registration and licensing requirements.”*

On one hand, in the Asia-Pacific, particularly in major developing economies, FDI in digital businesses is characterized by stringent ownership, registration and licensing requirements:

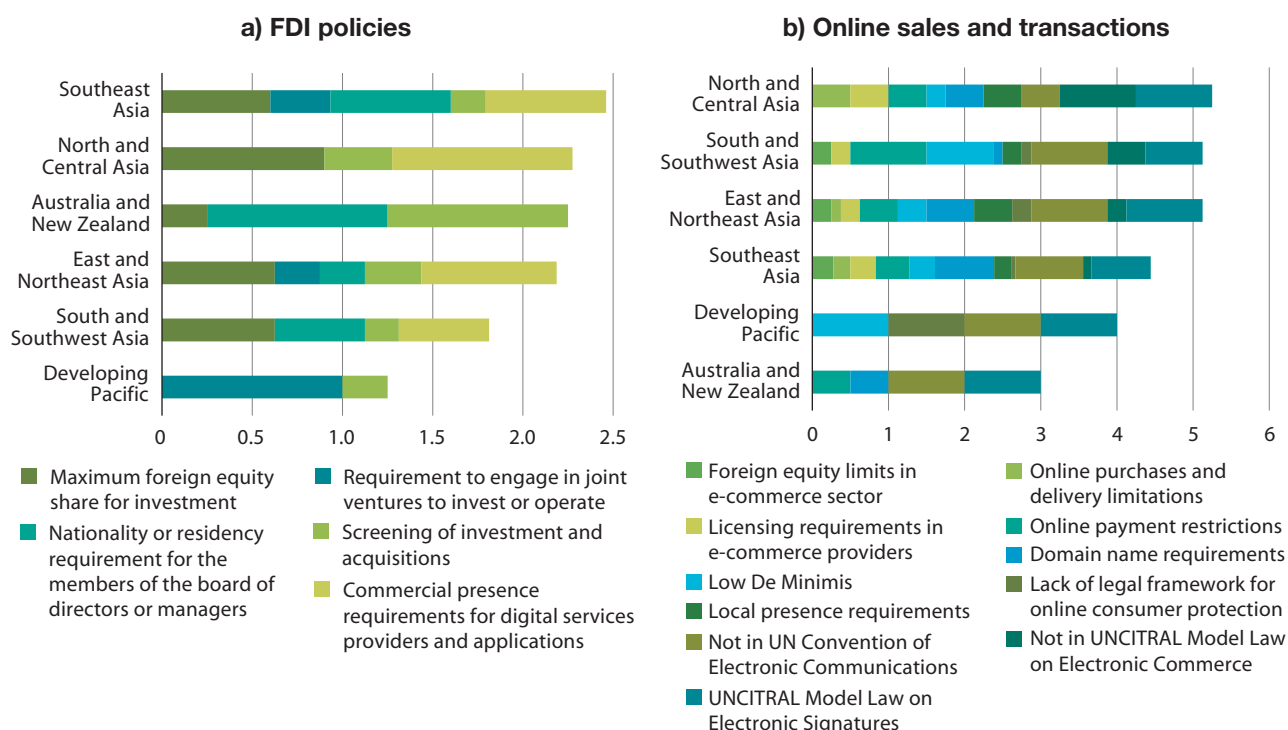
- **Ownership requirements.** For example, in Indonesia, the local ownership requirements for non-bank payment services are more stringent than for other businesses in general. For most businesses, Indonesian shareholders must hold a minimum of 15% of voting rights. However, this percentage jumps to 51% for digital payment services. Moreover, in clearing and settlement services, 80% of the shareholders must be Indonesian citizens (UNCTAD, 2021d);
- **Registration and licensing requirements.** For example, in Indonesia, foreign e-commerce businesses must establish a foreign trade

company representative office as part of their business registration prerequisites. They need to register their home country business licence with an authority and comply with particular local procurement guidelines, among other stipulations (UNCTAD, 2020b). Moreover, in Türkiye, e-commerce service providers with a net transaction volume exceeding 10 TRY billion (approximately US\$ 600 million) and have over 100,000 transactions within the economy excluding cancellations and refunds in a calendar year, must obtain an e-commerce licence;

- **Conditions on e-commerce activities.** Various measures have been enacted to regulate e-commerce businesses (figure 3.12b). For example, in India, competition policy measures aim to protect smaller sellers and curtail potential abuses by platforms that hold market dominance. For example, e-commerce marketplace entities cannot source more than 25% of their products from a single seller. Furthermore, firms that have equity ties with



**Figure 3.12** Indicators of policies affecting e-commerce and digital business in the Asia-Pacific region, 2022



Source: ESCAP, based on the RDTII database (<https://dtri.uneca.org/escap/home>) (accessed May 2023).

marketplace entities cannot sell their items on the said platform. On top of this, these entities must annually report compliance to the Reserve Bank of India (UNCTAD, 2019).

*“Many countries have simplified FDI regulations in digital domains, introduced fiscal incentives, upgraded their industrial and SEZs and introduced regulatory sandboxes.”*

On the other hand, many countries have streamlined FDI regulations in digital sectors, introduced tax benefits, enhanced their industrial zones and SEZs, and established regulatory sandboxes:

- **Countries are progressively relaxing FDI restrictions in the digital domain.** For example, the Republic of Korea repealed its long-standing ban on foreign digital ride-sharing platforms, a measure originally intended to protect domestic taxi businesses (The Pickool, 2022). Similarly, China launched a trial programme welcoming FDI in telecommunication services in key cities like Tianjin, Shanghai, Hainan and Chongqing. This initiative will also extend to areas such as tech services and e-commerce (UNCTAD, 2021e);
- **Regulatory modifications in cross-border ‘working capital’ and ‘venture capital’ rules.** For example, India and Viet Nam introduced Advance Price Agreements (APAs) to address potential governmental hurdles or taxes on subsidiaries. This is particularly crucial when digital projects demand close cooperation between local and parent firms (India, 2023a; Foley and others, 2021);
- **Monetary strategies are frequently paired with fiscal incentives.** For example, China and Malaysia offer full five-year tax breaks on technology and software acquisitions (ASEAN and UNCTAD, 2021). Furthermore, Singapore and India grant selected foreign startups with investment incentives, promoting local technological growth and easing the progression from ‘proof of concept’ to market ready solutions (Singapore, 2023b; India, 2023b). Beijing’s renowned Zhongguancun National Innovation Development Zone provides partial
- rent exemptions to high tech projects for up to two years (China, 2021);
- **Many countries offer tax and tariff incentives.** For example, China, Japan, Singapore and India use fiscal incentives such as corporate tax exemptions, which can range from 5 to 20 years, depending on project priority and import duty waivers on equipment and construction materials (ASEAN, 2021). Cambodia offers a depreciation allowance, Indonesia presents tax reductions, and India grants a full deduction for R&D costs and specific payments to research institutions (Deloitte, 2020). In Sri Lanka, companies exporting digital services are exempt from corporate taxes and are eligible for capital allowances if they are investing above a certain threshold. It is important to note that if factors like quality connectivity, digital expertise or venture capital availability are lacking, these fiscal incentives might not be as effective (ESCAP, 2023, p. 35). Thus, it is vital to evaluate these incentives in the broader business landscape of each country;
- **Asia-Pacific economies are digitally enhancing their industrial parks and SEZs to attract investors.** For example, China’s zones in Shenzhen and Urumqi have incorporated 5G and state-of-the-art broadband, catering to Industry 4.0 initiatives (China, 2020; Seetao, 2022). In a similar vein, Thailand and Singapore provide incentives for the formation of smart industrial zones connected to R&D canters (HLB, 2021; JTC, 2022). Such digital transitions bolster the operational efficiency of SEZs and underscore their significance in the host economy;
- **Regulatory sandboxes have been launched, before transforming into permanent initiatives.** The Central Bank of the Philippines piloted P2P mobile money systems, culminating in a national e-money policy in 2009. In Malaysia, the Central Bank explored eKYC and digital onboarding tools. MoneyMatch, an active participant in the initiative, innovated P2P remittance and crafted a user verification mechanism using facial recognition. It obtained the Central Bank’s approval in 2019 after necessary regulatory tweaks (World Bank, 2020).

## 4. POLICIES AFFECTING INNOVATION AND INDUSTRY 4.0

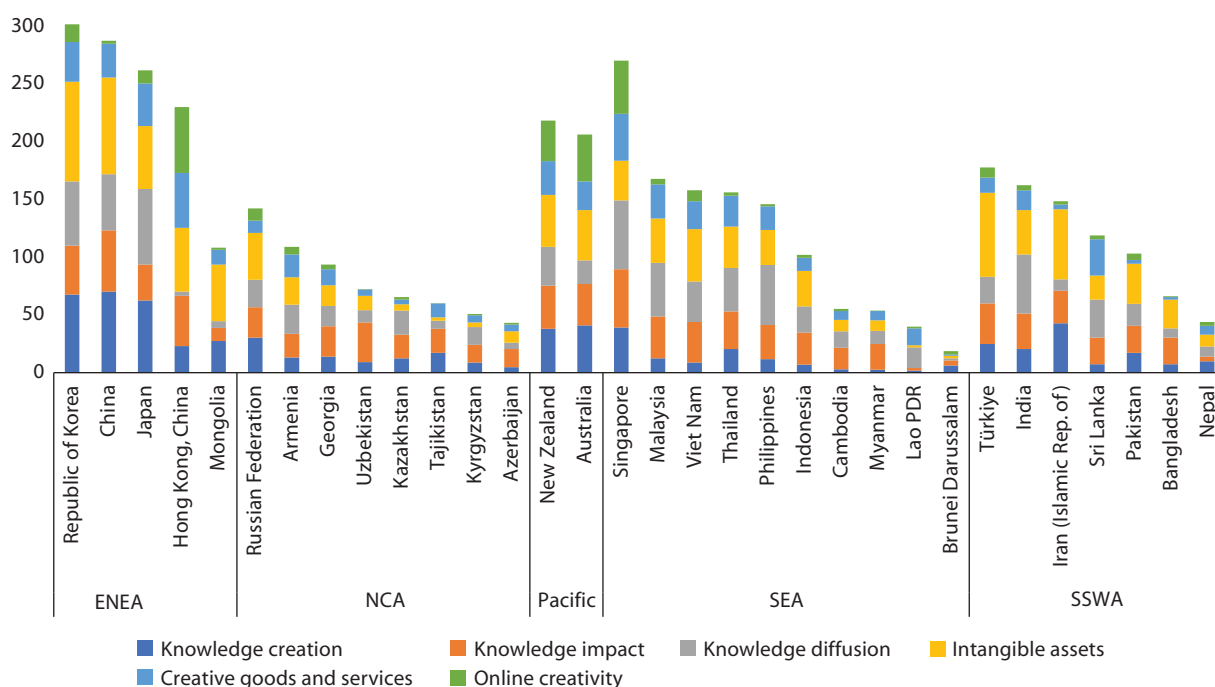
Innovation and Industry 4.0 mutually enhance of each other. Industry 4.0 embodies the latest wave of technological advancements in manufacturing and industry, driven by innovation. Moreover, innovation is instrumental in fostering sustainable development by augmenting productivity and propelling economic growth (ADB, 2022). In the Asia-Pacific region, findings from the Global Innovation Index (GII) reveal that South-East Asia, East and North-East Asia and the Pacific are narrowing the innovation performance gap with northern America and Europe (WIPO, 2022).

Within these subregions, the Republic of Korea, China, Singapore and Japan are the frontrunners (figure 3.13).

The interaction between industry, academia, and Government is necessary to transform the knowledge and innovation flowing across countries and industries. Regulatory mechanisms such as intellectual property rights (IPRs) and Government procurement are viable tools for fostering innovation and harness the potential of Industry 4.0.<sup>18</sup> At the same time, the adoption of harmonized standards is crucial in shaping the regulations and govern the fast pace digital transformation.

**Figure 3.13**

**Knowledge, technology, and creative outputs in the Asia-Pacific region, 2022**



Source: ESCAP, based on the WIPO Global Innovation Index (GII) database. ([https://www.wipo.int/global\\_innovation\\_index/en/2022/index.html](https://www.wipo.int/global_innovation_index/en/2022/index.html)) (accessed in September 2023).

Note: Knowledge and technology outputs cover knowledge creation (e.g., patent applications), knowledge impact (e.g., new firms spending on computer software), and knowledge diffusion (e.g., ICT services exports) variables. Creative outputs cover indicators on intangible assets (e.g., intangible asset intensity), creative goods and services (e.g., cultural, and creative services exports), and online creativity (e.g., mobile apps creation).

<sup>18</sup> No globally accepted definition of Industry 4.0. The original was initiated by the Government of Germany. The Industry 4.0 is a subset of the fourth Industrial Revolution; however, both terms are used interchangeably.

## 4.1 Intellectual property rights (IPRs)

*“In the Asia-Pacific region, the RDTII data show a trend towards adopting good practices in IPR policy.”*

In the Asia-Pacific region, the RDTII data show a trend of IPR policies that boost investor confidence in funding R&D and innovation. This includes laying down clear guidelines and exceptions in copyright regulations, such as the concepts of fair use and fair dealing.

Notably, the WTO Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS), serving as a minimum IP baseline, grants exclusive rights to IP owners to safeguard against unauthorized exploitation. As of September 2023, approximately 65% of the 58 Asia-Pacific economies are members of WTO and are, therefore, expected to adhere to the WTO TRIPS Agreement. Moreover, 50% of these Asia-Pacific member economies have ratified the WIPO Patent Cooperation Treaty, while 51% have become parties to the WIPO Copyright Treaty, among other WIPO treaties. Nonetheless, there is room for improvement in IPR enforcement. More than half of the surveyed economies have complex procedures for patent applications, and nearly 70% face online copyright enforcement concerns raised by their trade partner countries (figure 3.14a).

## 4.2 Public procurements

*“Asia-Pacific economies generally have a restrictive stance and are not a signatory of the WTO GPA.”*

Foreign participation in public procurement can enhance innovation through competition and knowledge transfer. However, the RDTII data show that the 22 Asia-Pacific economies generally have a restrictive stance and are not a signatory of the WTO GPA (figure 3.14b).

Specifically, several economies impose stringent conditions on foreign entities, which include mandatory use of local software, requirements for local data storage, and the necessity to establish

local offices or engage in joint ventures. Moreover, some surveyed economies have procurement conditions that may not align with the principles stipulated in the WTO TRIPS. For example, a few surveyed economies require the surrender of patents or trade secrets, such as the source code or encryption key, as a condition to win tenders.

## 4.3 Standards – Technical Barriers to Trade (TBT)

Standards can serve as a bridge between technology and policy to guiding the safe, secure, and trustworthy development and use of emergence technologies (Digital Watch Observatory, 2023). In Asia-Pacific, many surveyed countries have established rules for technical and encryption practices, but their implementation could be enhanced. A notable area for improvement is the coverage of conformity assessment bodies (CABs) across the region (figure 3.14d). The approval process for imported tech products in most of these countries could be streamlined. Notably, many of these countries do not permit foreign sellers to certify their products through self-declarations of conformity, referred to as SDoCs (figure 3.14c).

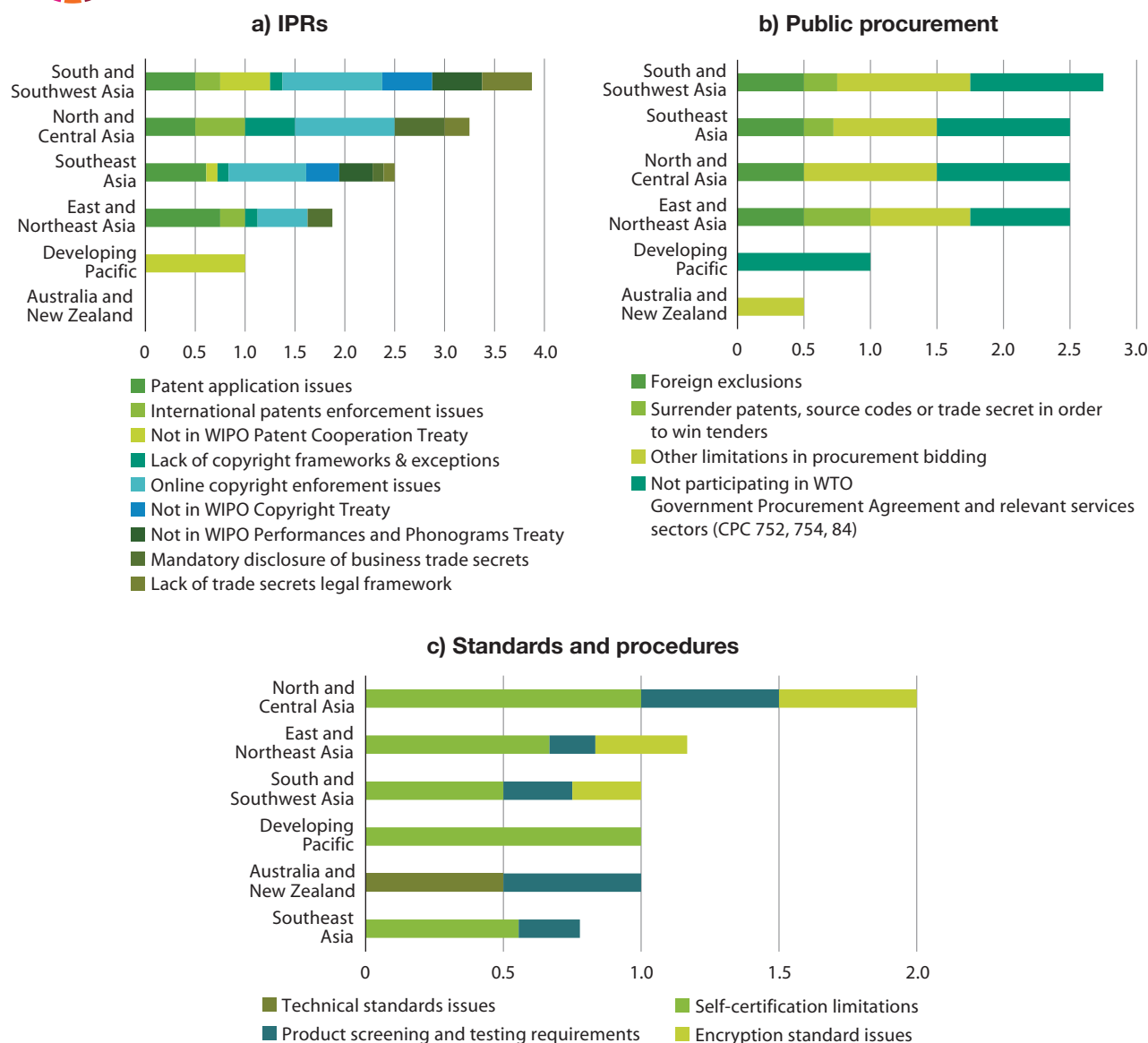
*“The growing diversity of technical standards underscores the importance of WTO TBT principles.”*

In the past few years, the Technical Barriers to Trade (TBT) Committee has seen a growing number and variety of regulations concerning modern technologies like IoT, 3D printers, drones and autonomous vehicles (Lim, 2021). The growing diversity of technical standards underscores the importance of WTO TBT principles for harmonization and transparency. The TBT Agreement grants flexibilities in policymaking to adapt to rapid technological changes. The Agreement does not define international standards, but it encourages harmonization by outlining the key principles for the development of international standards.<sup>19</sup> In the Asia-Pacific region, ASEAN, in their strategy for the Fourth Industrial Revolution, has acknowledged the importance of regulatory consistency and harmonization of technical standards across member countries (box 3.5).

<sup>19</sup> The six principles cover transparency, openness, impartiality and consensus, effectiveness and relevance, coherence and development dimension.

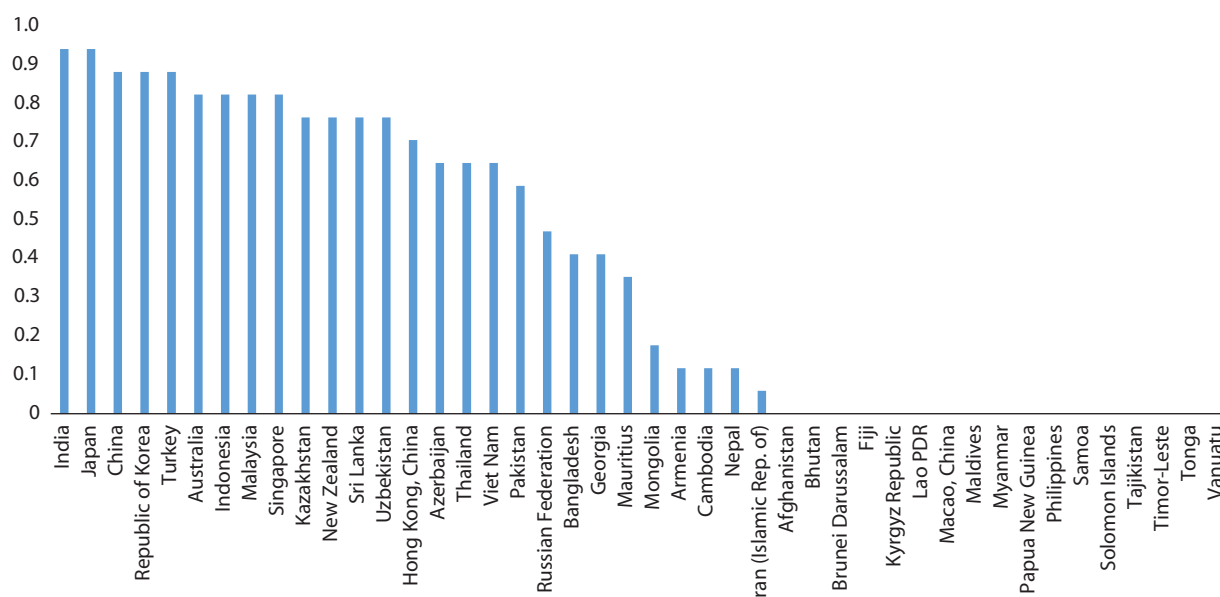


**Policies affecting innovation and Industry 4.0 in the Asia-Pacific region, 2022**





## d) CABs coverage



Sources: ESCAP, based on the RDTII database (<https://dtri.uneca.org/escap/home>), and Global Quality Infrastructure Index (GQII) (<https://gqii.org>) (accessed May 2023).

Note: Only 22 economies featured in ESCAP's RDTII 2.0 database are captured. GQII covers 44 Asia-Pacific economies



### Consolidated strategy of the Fourth Industrial Revolution for ASEAN<sup>20</sup>

On 29 April 2017, ASEAN highlighted the potential of Industry 4.0 at the ASEAN Summit as a mechanism to foster the region's growth and promote inclusive and equitable development. With the ambitious role of creating the Digital ASEAN community and reaping the benefits of a more connected and competitive region, ASEAN has launched a Consolidated Strategy anchored in three focus areas, which are Technological Governance and Cybersecurity, Digital Economy and Digital Transformation of Society. These focus areas reflect the efforts already championed by the ASEAN Community Council and the work that has already been started, which include the acceleration of inclusive digital transformation reflected in the ASEAN Comprehensive Recovery Framework (ACRF).

Through the synchronization of strategy, it will allow the region to facilitate Industry 4.0 as a stimulus for developing a competitive advantage to sustained economic growth while accounting for the varying levels of digital readiness anchored in the principles of community driven, inclusivity and practicality.

<sup>20</sup> Association of Southeast Asian Nations (2021) *Consolidated Strategy on the Fourth Industrial Revolution for ASEAN*. Jakarta, Jakarta: Association of Southeast Asian Nations.



## 5. CONCLUSION

*The dual nature of digital trade and investment policy strategies in the Asia-Pacific region raises questions about potential implications for market efficiency and competition.*

This chapter reveals that the digital policy landscape in the Asia-Pacific region is diverse and occasionally fragmented. A closer examination brings forth a dual nature in policy strategies. On one hand, there is a trend towards digital trade enabling policy, reflected in endeavours such as tariff reductions, the growing initiatives that promote trade facilitation, and crafting incentives to attract digital foreign direct investments. On the other hand, there is a marked gravitation towards establishing rigorous digital governance norms. When these are compounded with multifarious licensing and ownership criteria, it raises a question regarding potential implications on market efficiency and competition.

Furthermore, the diverse digital trade and investment regulations in place have led to increased costs in digital trade. For small businesses, these costs can be so prohibitive that they risk being pushed out of international markets. For consumers, the inconsistent regulatory framework might discourage full participation in the rapidly evolving digital economy due to concerns about online security and trustworthiness.

Gleaning insights from the policy trends laid out in this chapter, several policy implications emerge, crucial for harnessing digital trade as a potent growth engine for the developing Asia-Pacific region. Among others, the key implications extracted are:

### Infrastructure and cost of access

**Digital Infrastructure and regulations.** Easing ownership requirements and extending fiscal incentives demonstrate an inclination towards facilitating digital infrastructure investments in the region. However, State monopolies and intricate investment rules remain prevalent, signaling a need for more open telecom regulatory mechanisms.

**Tariffs and Non-Tariff Measures.** There is the ubiquity of Non-Tariff Measures in ICT equipment and services. Many of those are diverse technical measures. Embracing international standards, streamlining approval processes, and implementing WTO Agreements like the ITA, TBT and TRIMS potentially optimize costs and foster growth in digital trade and investment.

### Efficiency and trust in e-commerce and online transactions

**Digital trade facilitation.** Progress in cross-border paperless trade remains sluggish, with PIDEs and SSWA economies trailing other subregions. This underscores the need for regional economies to more effectively utilize digital trade facilitation instruments such as the CPTA, and UNCITRAL Model Laws.

**Online consumer protection and cybersecurity.** A holistic regulatory approach is needed, encompassing all aspects of online transaction. While many Asia-Pacific countries have rolled out consumer protection and cybersecurity measures to enhance online payment safety, integration with global treaties remains a gap. The region's mechanisms for resolving cross-border disputes often lack efficacy, but hopeful steps are being taken by APEC and ASEAN.

**Data regulations.** Although a foundational understanding of data protection exists, the specifics of regulations differ considerably across economies. Enhanced global and regional collaboration is essential to address the lack of recognized equivalency in data protection standards between economies.

**Online platform regulations.** There is a prevalence of strict measures in many developing Asia-Pacific economies related to content screening and platform accountability. Meanwhile, concerns over major e-commerce platforms' potential unfair strategies have led to increased Government regulations. A prevailing challenge is the lack of definitive intermediary liability guidelines.

**Investment regulations.** Strategies like fiscal incentives and regulatory sandboxes are employed to attract FDI; however, their efficacy is questionable in light of the stringent regulations challenging digital businesses in this region. Particularly in developing Asia-Pacific economies, digital businesses often grapple with rigid ownership, registration and licensing rules. Notably, major economies are starting to relax these digital FDI restrictions, but their approach is frequently fragmented.

### Regulatory environment for fostering innovation and Industry 4.0

**Intellectual Property Rights (IPRs).** The region has witnessed significant participation in the WTO TRIPS Agreement and various WIPO treaties. This development underscores a commitment to striking a balance between safeguarding proprietary rights and fostering public access, thus catalysing innovation.

**Public procurements.** Many Asia-Pacific economies have adopted a conservative stance. Their restrictive approach is further highlighted by the fact that many have not signed the WTO GPA.

**Standards – Technical Barriers to Trade (TBT).** The surge in regulations associated with Industry 4.0 technologies underscores the pressing need for standard harmonization. ASEAN is at the forefront, championing initiatives aimed at achieving consistency in technical standards. However, several Asia-Pacific economies could further refine their rules concerning technical and encryption practices. The process of tech product approvals urgently needs simplification.

Overall, this chapter signifies that the priority should lean towards nurturing regional collaborations to enhance the interoperability of the regional digital trade ecosystem. Chapter 5 delves deeper, exploring the diverse facets of multilateral and regional cooperatives.

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# Promoting sustainable development in digital trade and investment: The role of trade and complementary policies

Building upon the opportunities and challenges outlined in chapter 1, this chapter illuminates the policy prerequisites to guarantee that the advantages of digital trade permeate a wider demographic, particularly benefiting MSMEs, marginalized sectors including women, and workforce. Furthermore, the chapter emphasizes the potential of digital trade as a catalyst for environmental sustainability. It delves into strategies to foster a circular economy enhanced by digital trade. However, it acknowledges that the growth of digital trade introduces unique challenges, such as the proliferation of e-waste, that require complementary approaches to address them.

To tackle these issues, the chapter lays out both trade-specific and complementary strategies to ensure that this report's pursuit of digital trade growth does not overshadow the sustainable development goals.

## 1. DIGITAL TRADE FOR ECONOMIC GROWTH

*“Key policies influencing economic growth involve digital infrastructure, competition in telecommunications, data flows and privacy, e-commerce and innovation.”*

Policies fostering the growth of digital trade, as highlighted in chapter 3, play a crucial role in propelling economic growth. First and foremost are the policies affecting digital infrastructure and the costs of access. These are policies overseeing competition and regulations in telecommunications and ICT services. Second, policies that facilitate e-commerce and encourage investment in digital businesses are crucial for the success of a digital trade-led growth model. Specifically, trade facilitation regulations, business licensing and investment directives play a significant role in determining the costs associated with digital trade. Minimizing these costs is essential for expanding digital trade opportunities, particularly for smaller enterprises. Equally significant are policies that establish a trusted digital trade environment. These regulations centred on data privacy and online consumer protection. Furthermore, policies promoting innovation – whether by protecting intellectual property, striking a balance between nurturing startups and ensuring fair competition, or encouraging interoperable standards

– not only drive the growth of digital trade but also bolster broader digital integration and foster technological advancement across sectors.

## 2. DIGITAL TRADE FOR INCLUSIVITY

### 2.1 MSMEs in cross-border e-commerce

MSMEs account for more than 90% of all businesses and 70% of employment in many developing Asia-Pacific economies (ADB, 2021a). With the Internet, MSMEs – in theory – can establish a global presence by participating in cross-border e-commerce. However, as discussed in chapter 1, MSMEs have yet to realize their full potential in digital trade.

#### Balanced digital-trade tax policies

In recent years, the tax landscape for digital trade has been increasingly challenging for MSMEs. Many countries have lowered the De Minimis Thresholds for imports of low-value consignments (box 4.1). In addition, there is growing uncertainty regarding the Moratorium on Customs Duties on Electronic Transmissions, which temporarily exempts electronic transmissions from import duties.

*“The transition away from a tax-free environment without a globally accepted tax framework will introduce complexities and increases compliance costs, particularly impacting MSMEs.”*

While the shift from a tax-free scenario will affect all businesses, these changes will likely have a more severe impact on MSMEs. Small businesses involved in cross-border e-commerce are particularly sensitive to even marginal increases in trade costs, as they often handle low-value transactions. Many of these firms lack the resources and capacity to handle sophisticated documents for tax reporting, collection and remittance. The situation becomes even more complex when they navigate redress procedures and claims for withheld taxes across multiple jurisdictions.

*“It is important to ensure competitive fairness between all firms, both large and small, and optimize tax policies to support MSME growth.”*

These complexities highlight the pressing need to ensure competitive fairness, considering both large and small firms, rather than just differentiating

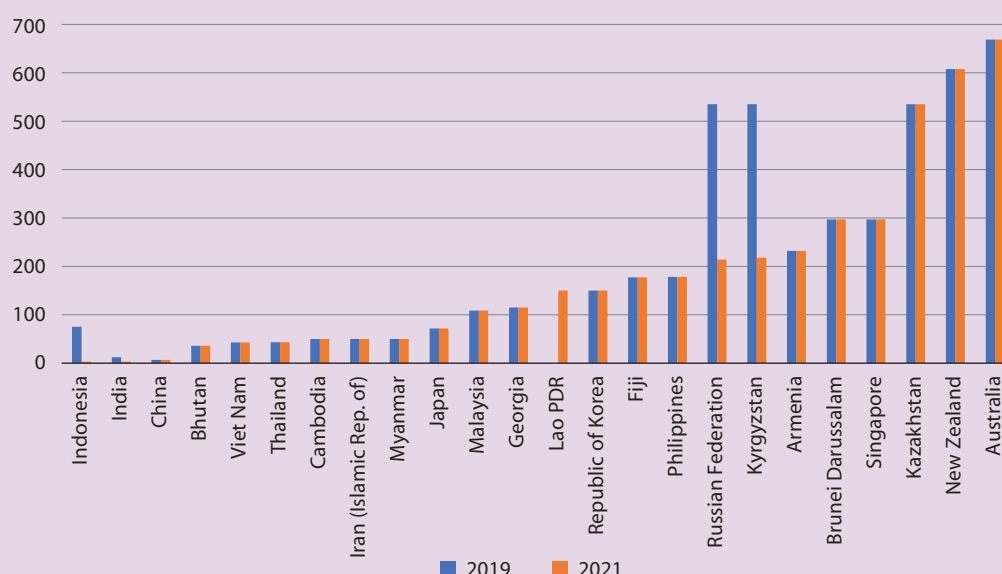


## Increasing uncertainties in the digital trade tax landscape: The de minimis and Moratorium on customs duties on electronic transmissions

### De minimis:

Many countries exempt low-value imports from border taxes, paperwork and VAT or GST since the administration cost often exceeds the potential revenue. However, increasingly concerns about the potential loss of revenue and putting domestic retailers at a disadvantage have prompted a re-evaluation of de minimis thresholds (WCO, 2015; OECD, 2019). Several countries have opted to lower their de-minimis thresholds, for example, Indonesia, India, Kyrgyzstan and the Russian Federation (see figure). Moreover, Australia<sup>1</sup> and Singapore<sup>2</sup> extended their GST systems to encompass low-value imported goods. As a result, more e-commerce goods and companies, particularly MSMEs, have faced import duties and sale taxes.

De minimis threshold in the Asia-Pacific region, 2019 and 2021



Source: ESCAP, based on data from Global Express Association, 2019 and 2021.

### Moratorium on customs duties on electronic transmissions:

The e-commerce moratorium, initiated in 1998 and consistently reaffirmed at World Trade Organization (WTO) Ministerial Conferences, provides a temporary exemption from customs duties for electronic transmissions. As the economy undergoes increased digitalization, several WTO members have begun to concern about the opportunity costs of the moratorium. Their apprehensions span from ambiguities regarding the moratorium's scope and the definition of electronic transmissions to concerns about missed customs revenue, and the wish to preserve policy flexibility amidst fast-paced technological shifts (Nordås, 2021). The WTO decides on the renewal of the moratorium at its ministerial conference every two years. The moratorium will expire on 31 March 2024, unless a decision to extend it is made before that date, which would occur at the Ministerial Conference 13 scheduled for February 2024.

<sup>1</sup> Effective from 2018, GST is applied to non-resident vendors selling low value goods (AU\$1,000 or less) to Australian consumers if their sales reach the registration turnover threshold of AU\$ 75,000 in the first year. See <https://www.ato.gov.au/Business/International-tax-for-business/GST-on-imported-goods-and-services/GST-on-low-value-imported-goods/#HowAustralianGSTworks>.

<sup>2</sup> Effective in 2023, GST 7% is applied to low value consignments (SG\$ 400 or less) for non-resident vendors selling to Singapore consumers (B2C) imported by post or air. See [https://www.iras.gov.sg/taxes/goods-services-tax-\(gst\)/consumers/gst-on-imported-low-value-goods](https://www.iras.gov.sg/taxes/goods-services-tax-(gst)/consumers/gst-on-imported-low-value-goods).

between offline and online entities. Regular dialogue between Governments and the private sector, encompassing both large corporations and small enterprises, is pivotal for a holistic approach to tax and trade challenges. It is vital for all stakeholders to stay informed about the ongoing tax shifts that could affect their trade opportunities.

### Simplified trade procedure

*“Simplifying trade processes is more essential than ever.”*

Simplifying trade processes, improving cross-border parcel movement and effectively handling returned goods are essential to bolster MSMEs. An OECD study indicates that refining trade procedures could elevate SMEs’ exports and imports by 4.5% (López González and Sorescu, 2021).

The UNTF Survey of 2023 found that more than 80% of countries in the region have launched programmes to improve SMEs’ access to trade information and

facilitate their understanding of trade procedures.<sup>3</sup> An example is Cambodia’s SeT4SME project (2021-2023), which aims to help SMEs navigate the global e-commerce market. However, there is room for improvement. For example, fewer than 30% of countries offer a Single Window mobile interface or computing centres for SMEs (figure 4.1).

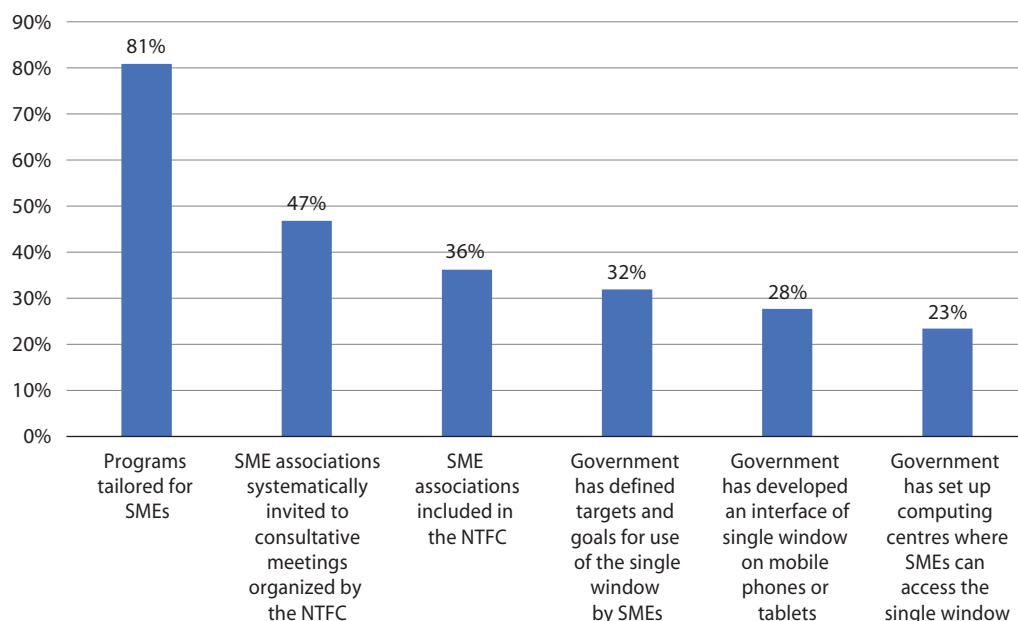
### Enhancing compliance capacity of MSMEs

*“Regulatory harmonization, legal guidance and regulatory information dissemination are also key.”*

Compliance issues discussed in chapter 3 suggests that ensuring adequate legal guidance and improving information dissemination about rules and regulations is essential for aiding MSMEs in their navigation through these regulations. Moreover, It is important to harmonize regulatory disparities between countries. This involves streamlining rules, adopting international standards and promoting regulatory collaboration to achieve mutual recognition of ‘equivalence’.



**The Asia-Pacific implementation of trade facilitation measures for SMEs**



Source: ESCAP, based on Digital and sustainable trade facilitation in Asia and the Pacific 2023 (forthcoming).

<sup>3</sup> See [www.untfsurvey.org](http://www.untfsurvey.org)

## Direct assistance to MSMEs for digital technology adoption

*“Tailored assistance is essential for MSMEs to promote their digital adoption, Industry 4.0 integration, and export competitiveness.”*

MSMEs often face greater challenges in adopting advanced technologies and engaging in digital trade compared with larger entities (as highlighted in chapter 1). This disparity underscores the need for targeted strategies. The following examples are the dedicated programmes available to MSMEs in the Asia-Pacific region:

- **Made in China 2025.** While Made in China 2025 is a comprehensive plan to upgrade China’s manufacturing sector, it includes measures and support for SMEs. This initiative encourages SMEs to integrate advanced technologies, including Industry 4.0, into their operations to enhance productivity and innovation;<sup>4</sup>
- **Industry4WRD (Malaysia).** The programme is led by the Malaysian Investment Development Authority (MIDA). It offers tax incentives, tools and training, and provides funding support to SMEs for adopting automation and smart manufacturing solutions. The Malaysian Digital Economy Corporation (MDEC) further bolsters this initiative by attracting digital FDI and offering grants for local digital innovation;<sup>5</sup>
- **Philippines Innovation Hubs.** The Philippines has established innovation hubs to provide SMEs with access to technology, training, and mentoring, helping them integrate Industry 4.0 strategies;<sup>6</sup>
- **Smart Factory Initiative (the Republic of Korea).** The initiative focuses on helping SMEs upgrade their manufacturing processes using smart technologies. It provides financial support, technology expertise and training;<sup>7</sup>
- **Singapore’s SMEs Go Digital Program.** The initiative provides SMEs with financial support and guidance to adopt digital technologies,

including Industry 4.0 solutions. It offers sector-specific solutions and subsidies to encourage SMEs to go digital.<sup>8</sup> In fact, Singapore offers a holistic support framework for SMEs (box 4.2).

## 2.2 Digital trade opportunities for marginalized groups

*“For a targeted policy approach to be effective, interventions must be grounded in thorough need assessments, evidence, and data.”*

For policies to be effective, especially those targeting inclusivity, a nuanced understanding of the various groups affected is crucial. Data segmented by factors such as sex, skill, migration status, age, location, indigenous identity, education and income can provide insights into specific challenges and disparities faced by these groups. By identifying significant disparity gaps, policymakers can then prioritize and tailor interventions for the most marginalized or affected groups. Ensuring that initiatives are evidence-based can enhance their effectiveness and ensure resources are allocated where they are most needed.

*“Research on gender highlights the disparities in digital skills and online business experience among women.”*

Research on gender highlights the disparities in digital skills and online business experience among women. Country studies by UN Women (2023) in China and ASEAN nations reveal that women-led SMEs encounter challenges in broadening their online markets, notably in exports. Women predominantly operate in sectors such as food, beverages and handicrafts. Entrepreneurs within these sectors often grapple with product standardization, adherence to regulatory demands, and proper labelling and packaging for online sales. Offering market insights and training on online sales and exporting can boost their competitive edge and pave the way for new export opportunities.

<sup>4</sup> See <https://nhglobalpartners.com/made-in-china-2025/>

<sup>5</sup> See <https://mdec.my/grants/smart-automation-grant>

<sup>6</sup> See <https://upscale.upd.edu.ph/> <https://www.qbo.com.ph/>

<sup>7</sup> See <https://www.seoulz.com/smart-factories-in-korea-the-governments-plans-the-future/>

<sup>8</sup> See <https://www.imda.gov.sg/how-we-can-help/smes-go-digital>



### Empowering small businesses: An example from Singapore

Singapore uses a holistic approach to enhance the competitiveness of small businesses in e-commerce and digital businesses:

**Retail Industry Transformation Map (ITM)** envisions productive omni-channel retailers, global brand owners and a skilled workforce. Initiatives like common IT standards and e-commerce development are being pursued to strengthen the sector's capabilities and global presence.

#### Start-up support community:

- **The Action Community for Entrepreneurship** offers co-innovation programmes, favourable tax regimes, and a range of support schemes, including corporate innovation, peer group mentoring and access to global markets and startup communities, all contributing to nurturing a vibrant and connected startup ecosystem in Singapore's e-commerce landscape;
- **Enterprise Singapore** has facilitated shared platforms for SMEs, including a shared e-commerce platform, to enhance operational efficiency. This e-commerce platform is particularly advantageous for SMEs seeking to enter e-commerce but facing initial capital constraints;
- **ezyCommerce** enables SMEs, including those in e-commerce, to receive up to 70% funding support for qualifying development and adoption costs, with 50% support for software and equipment-related expenses;
- **JTC's LaunchPad@one-north** provides an ideal environment and supportive ecosystem for e-commerce startups, situated in close proximity to a multi-disciplinary research and development (R&D) environment that includes innovative knowledge-based companies, institutes of higher learning and research institutions, making it a hub for innovation and entrepreneurship in the e-commerce landscape.

**Networked Trade Platform (NTP)** is designed to simplify and streamline the processes businesses have to go through when they are involved in trade. This is especially beneficial for SMEs, as it levels the playing field, granting them access to government services and essential trade services like electronic bills of lading and sea freight e-commerce. **Global eTrade Services (GeTS)** is integrated into NTP to assist businesses in meeting cross-border regulatory and compliance requirements by enabling the electronic exchange of trade documents between traders and foreign government agencies.

#### Skill development:

- **Talent development programme.** This effort falls under the broader SkillsFuture initiative, a collaboration between Workforce Singapore (WSG) and SkillsFuture Singapore (SSG). It offers a diverse range of skills development opportunities for individuals to enhance their competencies in e-commerce and related fields;
- **Skills framework for retail.** This is a part of Singapore's SkillsFuture initiative aimed at promoting skills mastery and continuous learning in the workforce, particularly within the Retail Industry Manpower Plan. It offers insights into the retail sector, including career paths, job roles, essential skills and training programmes for skill enhancement. In addition, it includes specialized training in e-commerce and Omni-channel operations, catering to the evolving needs of the retail industry.



*“PTAs with gender-related commitments can offer solutions, but they need to integrate clear, specific, and binding commitments.”*

Certain trade agreements appear promising in offering solutions. These agreements encompass cooperative provisions designed to diminish the challenges faced by underserved communities. For example, the Development Chapter of the CPTPP emphasizes collaborative efforts to enhance women’s skills and formulate education-centric policies.<sup>9</sup> Similarly, APEC’s Digital Workforce Development Project is geared towards broadening educational opportunities for under-represented groups.<sup>10</sup> Clearly, PTAs have the potential to bridge these gaps if they embed binding commitments to ensure non-discrimination and facilitate demand-driven capacity-building for specific groups<sup>11</sup> (ESCAP, 2023). However, this potential remains underutilized (Please see box 5.1 in chapter 5).

## 2.3 Cross-border trade in e-health and e-education services

As introduced in chapter 1, digital technology is transforming essential services, including health care and education, by making them digitally accessible from almost anywhere with Internet connectivity. For example, telemedicine can broaden health-care access to remote areas with ICT connectivity. Similarly, e-learning platforms such as Coursera or edX offer courses from universities and training institutions around the world. Beyond digital infrastructure, realizing such potential heavily relies on supportive regulatory frameworks and conducive trade policies.

In practice, essential services such as health care and education are frequently labelled as ‘sensitive sectors’ because of their direct influence on a nation’s public policy objectives. As a result,

liberalization in these services is typically limited, even within the GATS commitments.<sup>12</sup>

*“Limited-service liberalization and strict data transfer rules hinder cross-border delivery of health-care services.”*

In digital health services, strict regulations on the cross-border transfer of personal health information pose significant constraints to the cross-border delivery of the services (box 4.3).<sup>13</sup> Beyond data regulations, regulations overseeing medical services also have an impact. For example, India’s 2020 telemedicine guidelines stipulate that only medical practitioners registered with national or respective state medical councils are authorized to practice telemedicine within the country.<sup>14</sup> Similarly, in South-East Asian countries such as Indonesia, Singapore, Thailand and Viet Nam, international telemedicine services are mandated to be delivered in partnership with a health-care provider licensed in the patient’s home country (Intan and Defi, 2021).

*“Without a harmonized approach to trade policies in education services and digital trade, access to e-education services in developing Asia-Pacific economies may be restricted.”*

Both in developed and developing countries, Governments exercise regulation over education to meet their public policy objectives. This results in a myriad of domestic rules that can inhibit the full proliferation of trade in e-education services. Barriers such as limitations on electronic dissemination of academic materials or non-recognition of degrees secured via distance learning can impede the cross-border provision of education services (GATS Mode 1). Complications are further augmented by rules like nationality or residency requirements for educators. In addition, digital trade policies such as

<sup>9</sup> See CPTPP chapter 23, available at <https://www.mfat.govt.nz/assets/Trade-agreements/TPP/Text-ENGLISH/23.-Development-Chapter.pdf>

<sup>10</sup> See [tech.ed.gov/files/2019/04/APEC-Digital-Workforce-Development-Report-on-Promising-Practices-and-Design-Principles-Final.pdf](https://tech.ed.gov/files/2019/04/APEC-Digital-Workforce-Development-Report-on-Promising-Practices-and-Design-Principles-Final.pdf)

<sup>11</sup> Refer to chapter 5 for a detailed discussion on PTAs.

<sup>12</sup> Refer to GATS commitment in the WTO database. Available at [https://www.wto.org/english/tratop\\_e/serv\\_e/s\\_propnewnegs\\_e.htm](https://www.wto.org/english/tratop_e/serv_e/s_propnewnegs_e.htm)

<sup>13</sup> The issues of data regulatory intricacies are detailed in chapter 3. See also Postigo (forthcomings).

<sup>14</sup> See <https://www.mohfw.gov.in/pdf/Telemedicine.pdf>





### Different regulatory practices on health data in Asia-Pacific economies

Addressing the diverse requirements of different nations poses challenges for cross-border data transfers. These challenges are amplified in the domain of digital health services, marked by the sensitivity of personal data and the imperative for accurate data sharing.

- In **China**, health-related personal data, classified as “sensitive personal information,” is subject to stringent requirements. Processing this data requires explicit consent and is only allowed for specific and necessary purposes. Laws such as the Population Health Information Measures (2017) and Health Care Big Data Measures (2018) mandate that health information and health-care big data, respectively, must be stored on servers within China. The Electronic Medical Records Measures (2018) provides additional provisions concerning electronic medical records’ establishment, use and management.
- In **India**, health data are considered ‘personal data,’ with current legislation not requiring in-country storage, except for payment and insurance data (Bailey and Parsheera, 2021; Feigenbaum and Nelson, 2022).
- In contrast, the **Russian Federation**’s Federal Law on Personal Data mandates the use of local databases for storing and processing citizen’s data. (Andreeva and others, 2021).
- **Australia**’s Privacy Principles prohibit the overseas storage or handling of personal health data (Christie, 2022).
- In the **Republic of Korea**, while there are no general data localization laws, health-related data falls under “sensitive data” in the Personal Information Protection Act, requiring explicit consent for collection and specific notifications (Bae and others, 2021).
- **Thailand**’s Personal Data Protection Act also requires explicit consent for processing health-related data, treated as “sensitive personal data” (Horayangura and others, 2023).
- **Viet Nam**’s recent Personal Data Protection Decree designates health-related information as ‘sensitive’ and stipulates stricter regulations for collection and processing (Hille, 2023). Concurrently, a separate decree enforces data localization for telecom, Internet and service providers.
- Conversely, in **Singapore**, the Personal Data Protection Act does not require data localization and treats health data similar to other personal data.

restrictions on online content access and data flows can affect choices and affordability of e-education services.

However, in the Asia-Pacific region, various countries have shown examples of public-private investment in education and leveraging digital technologies to enhance education and training programs (box 4.4).

## 2.4 Cross-border digital economy workers

According to the OECD (2023), the majority of the global digital workforce is situated in Asia, with India leading (33% of English-speaking online platform workers in 2021), followed by Bangladesh (15%) and Pakistan (9%).<sup>15</sup> In developing nations, a significant

issue is also the informal status of many low-skilled digital economy workers; often referred to as part of “Gig workers”. Many remain outside of official social protection systems because they have not registered for taxation (ILO, 2022).

These challenges carry socio-economic consequences. The absence of standard labour protections leaves these workers susceptible to disparities like unfair wages, job insecurity and the unavailability of benefits such as health insurance or retirement plans. Furthermore, without adequate taxation mechanisms, Governments miss out on essential revenues that could otherwise be channelled into social services like education, health-care and other pivotal areas for sustained and inclusive growth.

<sup>15</sup> This region also dominates in online location-based and delivery platform employment (ADB, 2021b).



### Harnessing digital technology to enhance education: Examples from Asia-Pacific economies

Several Asia-Pacific countries have extensive programmes for enhancing digital skills. For example:

- China's Smart Education, launched in 2020, is an extensive online platform offering various learning resources. It supported distance learning during the pandemic and has trained more than 10 million teachers, primarily in remote areas. It was recognized with a UNESCO prize for its use of ICT in education in 2022;
- Singapore integrates digital technology in multiple ways, such as introducing robots into preschool classrooms through the Government's PlayMaker program, thereby promoting early childhood development. In addition, the SkillsFuture initiative, a comprehensive lifelong learning programme, provides resources for skill development and career advancement;
- In Kyrgyzstan, several private institutes, such as Codify, are training diverse populations in digital skills. Codify offers a comprehensive program including coding, programming and web development training, paired with a job-matching platform for local and international firms. They also support trainees with CV preparation and interview coaching.



*"Tackling these issues needs coordinated trade-, labour-, and tax policies"*

Addressing these challenges calls for multilateral and regional collaborative approaches. Some existing avenues for coordinated cross-border actions include:

- Future trade negotiations should assess the potential implications of trade agreements, especially their labour-related provisions, on a States' ability to guarantee appropriate conditions for platform workers. Specifically, these provisions are often located in chapters related to investment, e-commerce and cross-border trade in services;
- The World Economic Forum Charter of Principles for Good Platform Work (WEF 2020) commits the platform companies to principles of (1) diversity and inclusion, (2) safety and well-being, (3) flexibility and fair conditions, (4) reasonable pay and fees, (5) social protection, (6) learning and development, (7) voice and participation and (8) data management;<sup>16</sup>
- The ILO Tripartite Declaration of Principles concerning Multinational Enterprises and Social Policy (MNE Declaration) (2017) guides multinational enterprises on social policy, and inclusive, responsible and sustainable workplace practices;
- The United Nations model tax treaty provides guidelines for apportioning tax rights on income from services, including "managerial, technical, or consultancy services delivered remotely."<sup>17, 18</sup>



*"Resolving the informality associated with digital economy workers requires public-private collaboration between platforms and governmental bodies."*

Another important point for consideration is that resolving the informality associated with digital workers requires public-private collaboration between platforms and governmental bodies. Digital accounts, tracking workers' performance and earnings, can help integrate these workers into the

<sup>16</sup> International Labour Office (2021) *World Employment and Social Outlook 2021: The role of digital labour platforms in transforming the world of work*. Geneva: International Labour Office.

<sup>17</sup> United Nations Committee of Experts on International Cooperation in Tax Matters, "Taxation of Software Payments as Royalties," 4 October 2018.

<sup>18</sup> Another important framework is the OECD G20 Base Erosion and Profit Shifting (BEPS), designed to tackle tax avoidance by multinational enterprises and address double-taxation issues in digital services (OECD, 2022; Mullins, 2022).

tax system, formalizing their roles, and into social security schemes, ensuring they receive vital protection. However, new labour-policy frameworks should bridge labour and commercial laws and

safeguard the data privacy of labours.<sup>19</sup> Notably, the Asia-Pacific region has undertaken multiple initiatives to offer social protection to those in the digital economy (box 4.5).



#### **Integrating digital economy workers into social protection schemes: Examples from Asia-Pacific economies**

- The Government of the Philippines has prioritized social protection coverage for gig workers as part of its development plan (2023-2028). The country passed the Digital Workforce Competitiveness Act in 2022 to promote sustainable development and competitiveness of the digital workforce.
- India's proposed Code on Social Security includes provisions for life and disability cover, accident insurance, health and maternity benefits, old age protection and childcare for gig workers. Meanwhile, the All-India Gig Workers Union and All India IT and ITES Employees' Union work towards enhancing work conditions in specific sectors.
- Australia's Fair Work Ombudsman provides resources to ensure gig workers are aware of their employment rights and entitlements related to health, safety and compensation.
- Malaysia implemented the Self-Employment Social Security Act 2017, covering all economic activities. It also launched initiatives such as PenjanaGig and Kerjaya Gig to support self-employed workers in the digital economy.
- Many countries, such as Australia, Brunei Darussalam, China, India, Malaysia, the Philippines, Singapore and Thailand have implemented digital ID systems that help to ensure the authenticity of individuals within their social protection systems.

Sources: Government of Philippines, 2019, APEC, 2021 and Vadivel, 2021.

### **3. DIGITAL TRADE FOR ENVIRONMENTAL SUSTAINABILITY**



*“Several Asia-Pacific countries have adopted strategies to green their digital trade, with private sector collaboration playing a pivotal role.”*

Several Asia-Pacific countries have adopted strategies to green their digital trade and investment, with private sector collaboration playing a pivotal role. Notably, China is advancing eco-friendly practices by endorsing green packaging for e-commerce and enhancing supply chain management, with industry leaders like Alibaba Group championing these efforts (Deloitte, 2021; Alibaba Group, 2021). In India, a notable partnership with the Canadian apparel giant,

Lululemon, led to the establishment of a data science laboratory. This centre employs 250 local tech experts, harnessing data science, AI and cloud engineering to streamline global merchandise planning, consequently reducing excess inventory and overproduction.

Building on the connection between sustainable strategies and digital trade, numerous countries are shifting towards a digital-led circular economy. This model emphasizes not just eco-friendly measures, but also the principles of reusing, remaking and recycling resources. As this section delves further, the contributions of digital trade and trade and investment policies become clear. They are pivotal in merging digital advancements with the foundational concepts of the circular economy.

<sup>19</sup> Estonia's experience underscores the benefits of such cooperation. The Estonian Tax and Customs Board, in collaboration with Uber, launched a pilot project to link Uber's digital payment system with the State's digital tax system. This streamlines payments, eases administrative tasks, levels the playing field with the traditional economy and boosts tax revenue. Discussions are underway about expanding cooperation with digital labour platforms to monitor worker income for social security. While not fully active, Estonia's tax system can already view platform transactions via banks. (OECD, 2023).


### 3.1 The digital-led circular economy

As discussed in chapter 1, digital trade connects global markets, enabling the flow and adoption of innovations like sensor technologies, digital tracking systems and AI-powered supply chain optimizations. These technologies support the reuse and recycle process, ensuring resource optimization and minimal waste.

 *“An open digital trade environment is crucial for a circular economy.”*

An open digital trade environment becomes important for a circular economy. Key elements promoting this relationship include:

- **Data sharing.** Achieving the goals of the circular economy requires seamless data sharing among various stakeholders. These stakeholders operate in different segments, from circular supply chains involving products and materials to end-of-life value chains, secondary raw materials and the second-hand goods market;
- **Infrastructure and data governance.** Effective data exchange depends on harmonized regulations and a reliable, secure infrastructure for data storage and processing. Crafting clear guidelines, fostering trustworthy data governance, and promoting transparency, equivalency, and interoperability of standards and interfaces are essential;
- **Integrated approach.** A holistic strategy is crucial. Such a strategy should involve all governmental departments, and offer clear guidance for all players in the circular economy. However, data from the ITU indicate that the collaboration between ICT and other authorities has substantial room for improvement, especially in economies of North and Central Asia, PIDEs and LDCs (figure 4.2).

 *“Aligning licensing fees and varied product standards with the TBT Agreement is essential for a seamless transition to a circular model.”*

Beyond digital trade measures, traditional trade and investment policies also play a crucial role. Specifically, trade policy measures influence the

accessibility and cost-effectiveness of environmental services essential for a circular economy. For example, licensing fees for waste transporters, costs associated with storage and paperwork delays, and costs for securing waste trade permits can considerably hinder activities such as repairing, reusing, remanufacturing and recycling. Furthermore, the circular economy encompasses a broad spectrum of standards, including those for eco-design, eco-labelling, material content, material quality, recyclability and reparability. However, the surge in varied product regulations and standards that are not in line with the TBT Agreement obligations might impede progress towards embracing a circular economy.

### 3.2 International cooperation for cross-border e-waste management

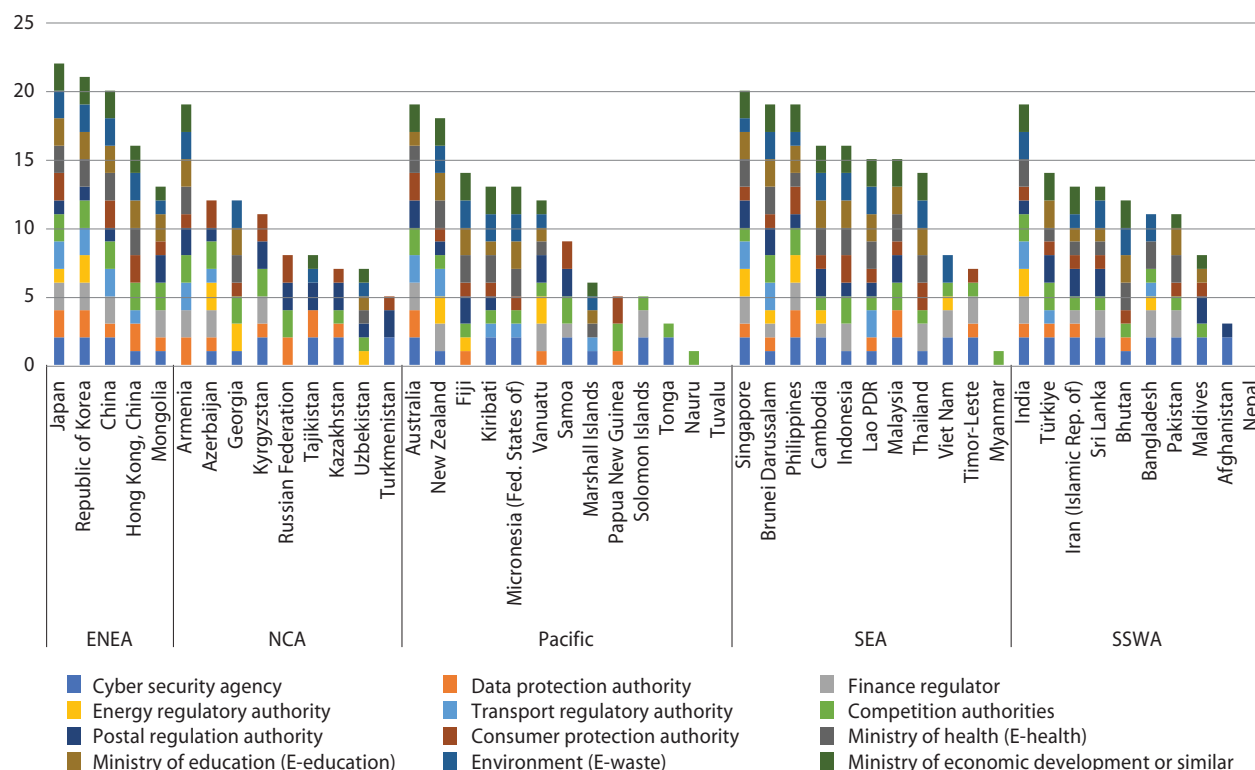
 *“The surge in digital trade and device usage exacerbates e-waste challenges.”*

The growth of digital trade, marked by the increased use of digital devices has inadvertently led to an increase in e-waste. Yet many developing economies lack the capacity to safely handle discarded device (Wang, Zhang and Guan, 2016). For example, in Thailand, as reported by the Pollution Control Department (2020), the country generated 421,335 tons of domestic e-waste in 2019, of which only 500 tons were reported to have been collected and managed.

Specifically, illegal exports of e-waste have led to growing international concerns. Observations indicate used devices from developed economies frequently become illicit e-waste exports to developing economies, with insufficient customs control enforcement (Tribune, 2022). Studies by the Basel Action Network (2016 and 2018) indicate that e-waste from North American ports primarily ends up in developing Asian countries, including China, Pakistan, Viet Nam, Indonesia, Malaysia and Thailand. Import bans, such as those implemented in China and Thailand, aim to mitigate these issues (box 4.6). However, the effectiveness of these measures is often questioned as ambiguous definitions, incorrect categorizations and data inaccuracies allow illegal imports to persist (Davenport, 2020; Geeraerts, Illes and Schweizer, 2015).



Coordination between ICT and other authorities in the Asia-Pacific economy



Source: ESCAP, based on the ITU G5 Benchmark (<https://app.gen5.digital/benchmark/metrics>).

Note: The index indicates collaboration between the ICT policy body (e.g., telecom/ ICT/ communication ministry or ICT regulator) and various authorities within the respective economies.

*“The growing transboundary e-waste challenge emphasizes the crucial role of trade and investment policy interventions that bolster international collaboration on environmental management, trade and investment in environmental services.”*

The increasing transboundary e-waste problem highlights the urgent need for international collaboration on cross-border environmental management and recycling services. This necessitates trade policy interventions focusing on regulatory cooperation using existing international frameworks, streamlined trade processes, enhanced trade data classification, and comprehensive trade agreements that emphasize mutual regulations, customs controls and transparency in electronic measures. Considering these complexities, areas for trade policy interventions include:

- **Regulatory cooperation.** Varied regulatory standards often impede the lawful international movement of e-waste earmarked for resource recovery. Utilizing international frameworks like the United Nations’ Basel Convention, the European Union Commission’s Waste Shipment Regulation, and the Bamako Convention, backed by 12 Organisation of African Unity nations, could address e-waste management challenges more effectively. To bolster the efficacy of these agreements, there is a pressing need for an international body to set cohesive standards for Electronic and Electrical Equipment (EEE) manufacturing and e-waste recycling, and to prevent misuse of heterogeneous standards for illicit trade in e-waste (Mohanty and others, 2015);
- **Trade facilitation.** Collaborative efforts among countries to establish streamlined trade permit



systems or pre-export checks can address illegal e-waste movements. A simplified notification process would allow border officials to allocate more resources to monitoring unlawful e-waste transfers;

- **Trade digitalization.** Accelerated paperless trade facilitation can reduce the impact of trade procedures on the environment. Research by ESCAP indicates that fully digitalizing trade regulatory processes in the Asia-Pacific region could reduce CO<sub>2</sub> emissions by 13 million tons, equivalent to planting 439 million trees (Duval and Hardy, 2021). The electronic Single Window in Vanuatu reduced CO<sub>2</sub> emissions by 5,827 kg by eliminating the use of papers in two trade procedures (ESCAP, UNEP, and UNCTAD 2021, p.95). Trade information portals have also been found to be an efficient tool in reducing energy consumption as they increase transparency and

make it easier for traders to access the information needed to fulfil administrative trade requirements (Ibid.);

- **Trade data collection and classification.** Current global trade data fails to differentiate between new electronics and e-waste or between e-waste and recyclable material. The World Customs Organization's 2022 Harmonized System (HS) amendments, which include provisions specifically for e-waste classification, are expected to simplify identification issues related to e-waste (WCO, 2022);
- **Trade agreements.** Comprehensive trade agreements can be instrumental if incorporate binding commitments and mechanisms to boost cooperation on regulations, customs control and transparency concerning EEE-related technical measures and technical regulation formulation among its signatories.



#### Strategies for e-waste management in Asia-Pacific economies

**Extended Producer Responsibility (EPR):** Japan, the Republic of Korea, and Singapore have the ERP policy which require manufacturers to be responsible for collecting products from households and delivering them to regional e-waste aggregation stations. They must also accept an old product when selling a similar new model. Costs of collections and recycling are borne by buyers. In Japan, for example, buyers are required to buy a recycling ticket and provide this ticket to the collection agent while discarding their Waste Electrical and Electronic Equipment (WEEE) (Japan, 2022; Chung and Murakami-Suzuki, 2008).

**Import bans:** In China, the Government launched a 10-month-long Operation Green Fence campaign in 2013 to regulate the activities of containerized waste imports better, including e-waste imports. Customs officials were deployed to ports to conduct rigorous inspections and physical checks on containers (Earley, 2013; Geeraerts, Illes and Schweizer, 2015). In Thailand, the Ministry of Commerce issued the Notification on Electronic Waste as Prohibited Goods for Importation into the Kingdom in October 2020. Violations of this order are punishable by a jail sentence of up to 10 years, a fine equivalent to five times the price of the e-waste imported illegally, or both (Arunmas, 2020).

**Exports:** In small developing economies, the amount of e-waste generated domestically falls short of the threshold required to maintain local processing facilities. As a result, shipping to nations that have the requisite facilities emerges as the only option (PREVENT and StEP, 2021).

## 4. CONCLUSION

Overall, the chapter stresses that for digital trade and investment to truly serve sustainable development, an all-encompassing strategy is pivotal. As pointed out, this includes harmonizing rules, targeted initiatives to overcome digital divides for vulnerable groups, promoting public-private collaborations and fostering international alliances to tackle challenges related to sustainable development. Drawing from a range of examples and discussions, the chapter introduces the following policy considerations.

- The increasing transition from a tax-free environment of digital trade is challenging, **particularly for MSMEs** in e-commerce and digital services. These challenges underscore the importance of fostering competitive equity among both large and small enterprises, rather than merely distinguishing between offline and online players. Engaging in regular dialogues between Governments and the private sector, including major corporations and smaller businesses, is crucial for devising inclusive digital trade and tax policies. Meanwhile, as the advantages of tax-free digital trade fade, the importance of simplifying trade procedures to offset escalating costs rises. This underscores the need for policies focusing on paperless trade measures for MSMEs. Furthermore, for effective cross-country regulatory navigation, MSMEs necessitate a harmonized regulatory framework, unambiguous legal directives and easily accessible regulatory data. Adopting international norms, endorsing regulatory synergy and promoting mutual 'equivalence' recognition are not just essential for the overarching economy but are especially crucial for inclusive digital trade.
  - **Underserved groups**, especially **women**, are part of MSMEs and labour force. Research pointed to a distinct imbalance in digital skills and online business experience among women. Strengthening collaboration between public and private stakeholders, with a focus on targeted, demand-driven training and financial assistance, is vital to bridge this gap. Ensuring the success of strategies tailored for these groups necessitates grounding them by thorough needs assessment research. Furthermore, PTAs with gender stipulations offer a potential solution.
- However, realizing their full impact requires the integration of clear, specific and enforceable provisions to bridge the digital gender divide.
- The potential of cross-border digital delivery of essential services, particularly in **digital health** and **e-education**, promises a unique opportunity to intertwine trade in services and inclusive development. Although digital health services present vast potential, they encounter obstacles in cross-border delivery, including stringent service liberalization and data transfer protocols. Similarly, the cross-border distribution of online educational services underscores the need for refinements in both service and education policies. These challenges highlight the untapped opportunities that are overshadowed by both traditional and digital trade barriers, preventing access to innovative solutions in service sectors. This situation emphasizes the need for a unified strategy in trade policies across these sectors and in digital services, including digital governance rules.
  - Addressing the complexities surrounding **digital economy workers** necessitates a holistic and collaborative strategy. Tackling these issues calls for integrated efforts, such as weaving labour-related clauses into trade agreements as well as labour and tax treaties. Outside the realm of trade policy, the informal status of digital economy workers calls for joint efforts between online platforms and governmental bodies. The goal is to formally recognize these workers, thus guaranteeing them essential social benefits. Simultaneously, new labour policies must blend labour and commerce directives while safeguarding worker data privacy.
  - The synergy between sustainable methodologies and digital trade is seen in **the circular economy**. Central to this is an open digital trade system that ensures the circular flow of goods and materials, supported by cross-border data flows and digital services. It is also important to highlight the important role of traditional trade and investment policies, particularly in environmental services as well as trade in waste and recyclables. Among these trade policy measures are technical standards on eco-design, eco-labelling and recyclability and paperless trade facilitation. An emerging challenge is that the proliferation of technical



regulations could obstruct this green transition if they deviate from the TBT Agreement. However, with the expansion of digital trade comes the escalation of cross-border illegal movements of e-waste. Addressing this challenge necessitates international collaboration, with an emphasis on updating trade classifications in accordance with the HS 2022 standards, and harnessing comprehensive trade agreements to underscore regulatory cooperation, at-the-border coordination for curbing illegal e-waste shipments, and advance trade and investment in environmental services within the region.

To conclude, in addressing the challenges faced by the Asia-Pacific region, particularly in harmonizing trade, investment, data protection and overarching policies, several foundational elements emerge as pivotal in the formulation of a robust digital trade framework:

- **Targeted intervention.** It is important to ensure that digital trade and investment initiatives do not inadvertently marginalize or disadvantage certain

sectors of the population. Authorities must duly identify these groups and devise strategies that cater to their specific needs;

- **Regulatory consistency.** Disparities in regulations might inadvertently privilege certain entities over others. Establishing a consistent regulatory framework is thus of paramount importance for inclusivity;
- **Collaborative efforts.** Given the cross-border nature of digital trade-related challenges, collaboration at both the national and international levels is essential. This can be facilitated through formalized agreements, collaborative committees or the dissemination of standardized practices;
- **Holistic perspective.** In shaping policies for the digital domain, policymakers must adopt an integrative approach that considers its implications on the broader economic landscape and remains in alignment with the SDGs. This ensures a balanced growth trajectory, wherein the advancement of the digital sector does not impede other facets of the economy.

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## CHAPTER



# Pursuing sustainable development through multilateral and regional cooperation in digital trade



Cooperation in digital trade rules could potentially be geared to pursue sustainable development. For example, Burri and Kugler (2023), in their qualitative review on digital trade provisions (DTPs) in trade agreements, suggested that commitments related to consumer protection, business trust,<sup>1</sup> data protection, enabling digital inclusion, electronic transactions facilitation and cybersecurity may represent measures aimed at addressing challenges related to sustainable development.<sup>2</sup> This chapter further explores the impact of DTPs on sustainable development and provides an overview of the status quo and the ongoing trends in multilateral and regional cooperation on digital trade, especially in the Asia and the Pacific region.

Multilateral cooperation covers the WTO rules related to digital trade and the ongoing initiatives and negotiations within the WTO. Regional cooperation covers preferential trade agreements (PTAs) signed by Asia-Pacific countries and other instruments that address digital trade-related issues.<sup>3</sup> A comparative analysis of DTPs across PTAs is presented, leveraging the Asia-Pacific Trade and Investment Agreement Database (APTIAD)<sup>4</sup> and the new ESCAP automated Regional Trade Agreement Text Analyzer, among other tools. Based on the comprehensive review and comparative analysis, the chapter provides recommendations on advancing regulatory cooperation in digital trade to reach sustainable development.

## 1. IMPACTS OF DIGITAL TRADE PROVISIONS ON SUSTAINABLE DEVELOPMENT

*“Empirical studies have concluded that the implementation of digital trade provisions tends to enhance digital trade, especially trade in services.”*

The inherent objective of DTPs is to achieve economic growth through boosting digital trade. There are several studies which have empirically

analysed the impact of DTPs on trade, and all of them have concluded that the implementation of digital trade provisions tends to enhance digital trade. Wu and others (2023) utilized data on bilateral global value chain (GVC) services exports to examine the impact of digital trade provisions as a key factor affecting the development of GVC services trade, and concluded that both the depth and scope of digital trade rules have a positive and significant effect on service trade. Similarly, Suh and Roh (2022) used data on cross-border service supply (Mode 1) as a proxy for digital trade and found that the impact is even stronger when deeper agreements are established between the parties. APEC (2023) noted that the inclusion of DTPs in trade agreements had a positive effect on digitally ordered and digitally deliverable trade between the APEC economies and its major trading partners. In particular, provisions designed to enhance consumer trust and lower market entry barriers exhibited the most significant impact on digital trade. Ma and others (2023) found that, for low-income countries, provisions promoting cross-border transfer of data and electronic information exhibited a promotional effect on the export of goods and services.

*“Significant and positive impacts of digital trade provisions found across all areas of development.”*

ESCAP explored the links between the existence of DTPs in trade agreements and performance of economies of the region based on specific SDG Target indicators covering economic, environmental and social aspects of sustainable development. Specifically, ESCAP research indicates that 10 additional DTPs in trade agreements are associated with an increase of 0.08 percentage points in the growth rate of an economy's real GDP per capita. The results summarized in figure 5.1 suggest that DTPs have a statistically significant positive impact in essentially all areas

<sup>1</sup> Commitments on business trust encompass provisions on source code, algorithms, and encryption.

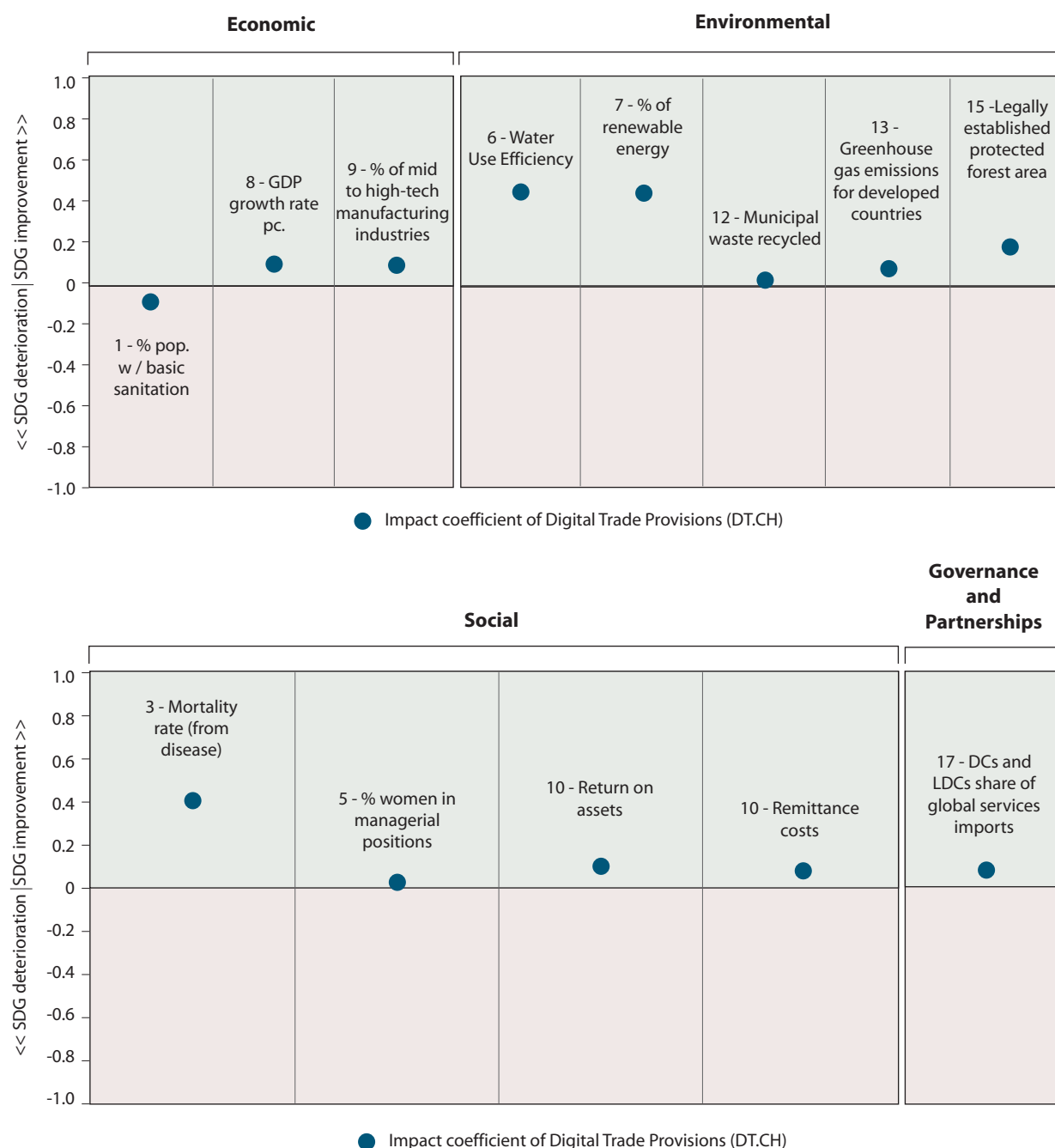
<sup>2</sup> Burri, Mira and Kholofelo Kugler, ‘Digitization, regulatory barriers and sustainable development’ (2023) SSRN Trade Law 4.0 Working Paper No 3/2023, [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=4424470](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4424470).

<sup>3</sup> This chapter covers bilateral, regional, inter-regional agreements, and other related agreement models. The use of the terms regional trade agreements (RTAs), preferential trade agreements (PTAs) and free trade agreements (FTAs) in this chapter does not aim to distinguish them from each other, but to encompass a range of agreement types between nations.

<sup>4</sup> Available at <https://www.unescap.org/content/aptiad>



Digital trade provisions in PTAs and SDG targets



Source: ESCAP.

Note: The graph presents normalized coefficients of impact on SDGs of DTPs, as measured by the number of trade chapters with digital provisions across international agreements (DT.CH). The coefficients range from 1 to -1, where 1 represents the highest positive impact recorded across all digital trade-related variables examined and -1 is its opposite.

of SDG development.<sup>5</sup> For example, DTPs are found to have positive impact on environmental targets such as Water Use Efficiency (SDG 6) and Share of Renewable Energy (SDG 7) as well as the social target such as Mortality rate from disease (SDG 3).<sup>6</sup> This reflects how digital trade cooperation and higher levels of digital infrastructure and regulatory readiness can help to harness the benefits of the digital revolution across a wide range of SDGs. Interestingly, the level of bindingness of DTPs does not seem to influence the impacts of the provisions on the SDGs. These results may be influenced by the prevalent characteristic of PTAs in Asia-Pacific countries, which tend to emphasize ‘best endeavour’ commitments.

In the light of the empirical and potential impacts of international agreements with DTPs on sustainable development, the following sections of this chapter review the ongoing trends of cooperation in digital trade rules.

## 2. SHAPING BASELINE DIGITAL TRADE RULES THROUGH MULTILATERAL COOPERATION

Multilateral cooperation in digital trade can be traced back to 1998, when the Work Programme on E-commerce was established (WTO, 1998). The most influential result under the Work Programme might be the Moratorium on Customs Duties on Electronic Transmissions – many PTAs have gone further by making this Moratorium permanent. Despite some minor regulatory adjustments WTO law has remained essentially in a pre-Internet state.<sup>7</sup> Arguably, the

current WTO law is able to address digital trade issues because the judicial body of the WTO has interpreted and applied WTO rules in various Internet-related trade disputes.<sup>8</sup> Nevertheless, there are still lots of debates and concerns on applying the WTO rules formulated in the pre-digital era to digital trade.<sup>9</sup> The Trade Facilitation Agreement (TFA), which is the only new recent multilateral agreement reached by the WTO, does support trade digitalization, with some provisions promoting the acceptance of electronic documents and electronic payments by government authorities.

*“Despite some minor regulatory adjustments, WTO law has remained essentially in a pre-Internet state.”*

Partly because of the stagnation of the Work Programme on E-commerce, the Joint Statement Initiative on E-commerce (JSI) was initiated by a group of 76 WTO members.<sup>10</sup> As of February 2023, there were 89 WTO members participating in the ongoing discussions on e-commerce, accounting for more than 90% of global trade. However, scholars took a careful look at the submitted documents under the JSI and noted that, while there are substantial improvements compared with previous developments under the Work Programme on E-Commerce, they do not necessarily reflect convergence of views on the key issues.<sup>11</sup> Although in their statement on 20 January 2023, ministers of the JSI co-conveners expressed their objective “to work towards substantial conclusion by end of 2023” (WTO, 2023), a far-reaching agreement with comprehensive provisions on e-commerce may be difficult.<sup>12</sup>

<sup>5</sup> The impact models include Digital Trade Variables (DTV) to separately capture the impact of DTPs on digital trade itself. The DTV coefficients have remained stable – and largely unchanged – across model specifications, suggesting that while DTPs may have an impact on the level of digital trade itself, the models successfully isolate the impacts of DTPs on SDGs. Please see Anukoonwattaka and others (forthcoming) for details.

<sup>6</sup> These results are robust across different digital trade provisions variables. Apart from DT.CH, the sum of binding (X2) and non-binding (X1) digital trade provisions (together – i.e., X1 + X2 – and separately), gathered through TAPED, were also run. The gathered results were remarkably similar with the DT.CH specification herein displayed. Moreover, extremely similar results arose across the specifications regressing X1, X2 and X1 + X2.

<sup>7</sup> Mira Burri, ‘The International Economic Law Framework for Digital Trade’, *Zeitschrift für Schweizerisches Recht* 135 (2015), 10–72; WTO, *World Trade Report 2018: The Future of World Trade* (World Trade Organization, 2018), [https://www.wto.org/english/res\\_e/publications\\_e/wtr18\\_0\\_e.pdf](https://www.wto.org/english/res_e/publications_e/wtr18_0_e.pdf).

<sup>8</sup> Mira Burri, ‘Digital Trade: In Search of Appropriate Regulation’ (2021) 11–12, [https://www.researchgate.net/publication/356162751\\_Digital\\_Trade\\_In\\_Search\\_of\\_Appropriate\\_Regulation](https://www.researchgate.net/publication/356162751_Digital_Trade_In_Search_of_Appropriate_Regulation).

<sup>9</sup> Ibid.

<sup>10</sup> WTO, *Joint Statement on Electronic Commerce*, WT/L/1056, 25 January 2019, <https://docs.wto.org/dol2fe/Pages/SS/directdoc.aspx?filename=q:/WT/L/1056.pdf&Open=True>

<sup>11</sup> Burri, Mira, ‘Towards a New Treaty on Digital Trade’, *Journal of World Trade* 55, No. 1 (2021) 77–100, <https://ssrn.com/abstract=3623734>.

<sup>12</sup> WTO (2023, (20 January), *WTO Joint Statement Initiative on E-commerce: Statement by ministers of Australia, Japan and Singapore*. [https://www.wto.org/english/news\\_e/news23\\_e/igo\\_20jan23\\_e.pdf](https://www.wto.org/english/news_e/news23_e/igo_20jan23_e.pdf)

*“The plurilateral Joint Statement Initiative on E-commerce involving 89 WTO members hold promise but a far-reaching outcome will be difficult.”*

Instead, a less ambitious agreement focused on enabling and facilitating e-commerce with relatively relaxed commitments to data flows appears more likely.<sup>13</sup> The outcome of the negotiations within the WTO may nonetheless provide a useful baseline for digital trade rules, which will potentially serve as a minimum level of commitments for cooperation in digital trade. As discussed in the next section, emerging rules at the regional level provide potential building blocks towards wider, deeper and more comprehensive cooperation in digital trade.

### 3. ADVANCING REGIONAL COOPERATION IN DIGITAL TRADE

#### 3.1 Overview of the status quo of regional cooperation

*“Preferential agreements have become the main forum of rulemaking for digital trade.”*

As noted above, many countries have turned to preferential trade agreements to deepen integration and cooperation on digital trade.<sup>14</sup> The past two decades have witnessed spectacular growth of PTAs featuring digital trade and e-commerce related provisions.<sup>15</sup> Many PTAs have stand-alone chapters on e-commerce. Digital economy agreements (DEAs) that exclusively contain provisions related to digital trade (so-called ‘digital-only’ agreements) have also

emerged since 2019. In the past four years, six DEAs have been adopted, all of which have at least one party from the Asia-Pacific region. Singapore has been the most active country signing DEAs.<sup>16</sup> In addition, several regional arrangements focused on specific digital trade-related issues have also emerged. The APEC Cross-Border Privacy Rules (CBPR) System and the ASEAN Framework on Personal Data Protection (PDP) are two examples, addressing only data privacy. The ASEAN Single Window Agreement and the Framework Agreement on Facilitation of Cross-Border Paperless Trade in Asia and the Pacific are two other examples, focusing on digitalization of trade documents.

*“More recent PTAs tend to have a broader coverage and include more comprehensive provisions on digital trade.”*

A mapping of DTPs, including e-commerce provisions,<sup>17, 18</sup> in 463 PTAs – 237 of which include at least one Asia-Pacific country – confirms that the number of PTAs with DTPs has been steadily growing, with more and more PTAs featuring a chapter dedicated to digital trade (see figure 5.2). The share of provisions addressing digital trade issues per PTA has also steadily risen – the average has increased from 8.5% (PTAs signed during 2000–2010) to 23% (PTAs signed during 2011–2022). The increasing average number of DTPs per PTA reflects the fact that countries are increasingly recognising the importance of digital trade and digital trade rules. However, the average share of digital-trade-related provisions per LDC PTA<sup>19</sup> remains extremely low (less than 1%).

<sup>13</sup> Yasmin Ismail, ‘The Evolving Context and Dynamics of the WTO Joint Initiative on E-commerce: The fifth-year stocktake and prospects for 2023’ (2023), 18, <https://www.iisd.org/system/files/2023-04/wto-joint-initiative-e-commerce-fifth-year-stocktake-en.pdf>

<sup>14</sup> ESCAP, ‘Handbook on provisions and options for trade in times of crisis and pandemic’ (2021), <https://www.unescap.org/kp/2021/handbook-provisions-and-options-trade-times-crisis-and-pandemic>

<sup>15</sup> In the context of PTAs, the term ‘digital trade’ and ‘e-commerce’ are interchangeable, referring to the same or similar aspects and topics. As there is no universal definition of digital trade or e-commerce, their scope is subject to the specific definition provided by each PTA.

<sup>16</sup> US-Japan Digital Trade Agreement (USJPDPA, 2019), the ASEAN Agreement on Electronic Commerce (ASEAN AEC, 2019), Australia-Singapore Digital Economy Agreement (ASDEA, 2020), Digital Economy Partnership Agreement (DEPA, 2020) between Chile, New Zealand, and Singapore, United Kingdom-Singapore Digital Economy Agreement (UKSDEA, 2022) and the most recent one, Republic of Korea-Singapore Digital Partnership Agreement (KSDPA, 2022).

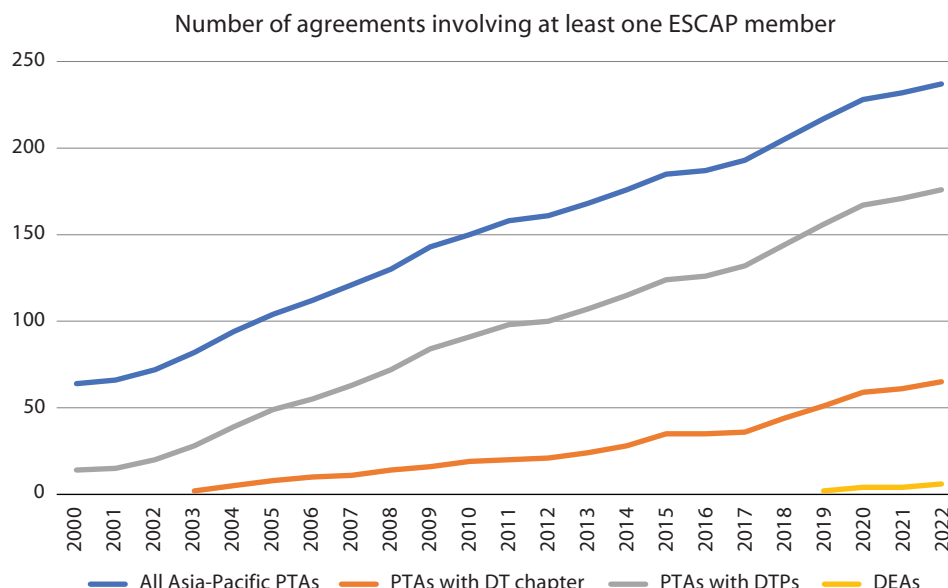
<sup>17</sup> Digital trade provisions (DTPs) include those that straightforwardly mention the term ‘digital trade’ or ‘e-commerce’, and those addressing digital trade topics without including the term per se. Therefore, a comprehensive review requires identifying all relevant keywords, coding and mapping all identified keywords in PTAs. They essentially include all articles under an e-commerce/digital trade chapter and any other articles that have digital trade related terms in their names, and all articles of DTAs.

<sup>18</sup> Beta version of the ESCAP Trade Agreement Text Analysis Tool is available at <https://tiid.shinyapps.io/text-analysis-tool/> – for more details on the methodology and algorithm behind the tool, please refer to [https://tiid.shinyapps.io/text-analysis-tool/\\_w\\_69bc132f/Technical\\_paper\\_text\\_analysis\\_tool.pdf](https://tiid.shinyapps.io/text-analysis-tool/_w_69bc132f/Technical_paper_text_analysis_tool.pdf)

<sup>19</sup> LDC PTA refers to PTAs that include at least one LDC.



**Digital trade provisions and chapters in PTAs and emerging DEAs in the Asia-Pacific region, 2000-2022**



Source: ESCAP.

Note: Preferential Trade Agreements (PTAs), digital trade chapter (DT chapter), digital trade provisions (DTPs), digital economy agreements (DEAs). Only PTAs including at least one ESCAP member are included; cumulative numbers from 2000 are presented. For the purpose of figure 5.2, DEAs are not counted in PTAs.

Figure 5.3 below reflects the status of the inclusion of DTPs in signed and enforced agreements among Asia-Pacific economies. Purple lines and blue circles refer to agreements with at least one digital-trade-related provision, while grey lines and circles represent agreements without DTPs. Moreover, the circles or triangles with orange lines represent agreements that provide comprehensive DTPs, i.e. DTPs which address a wider range of digital trade issues (the orange triangle refers to the ASEAN-Australia-New Zealand FTA upgraded in 2022).<sup>20</sup> Also, the bigger font for a name of an economy in figure 5.3 indicates a larger number of agreements with DTPs signed by that economy – Singapore, Australia, New Zealand, Republic of Korea, China, Japan and the United States are the most active ESCAP countries in signing agreements with DTPs.

The figure highlights that the East and South-East Asia economies have welcomed DTPs in their

agreements, while Central Asia and South Asia economies have generally not done so.

*“Low and lower middle-income economies are lagging behind in incorporating DTPs in their trade agreements.”*

Notably, Central Asia and South Asia lack of DTPs in their agreements within the region, compared to in their agreements involving parties outside the region. The pattern reflects that economies in Central Asia and South Asia have so far taken a passive approach when negotiating DTPs. Notably, only ASEAN LDCs in Asia-Pacific participated in agreements containing comprehensive DTPs, while the Pacific Island Forum (PIF) LDCs participated in the Pacific Agreement on Closer Economic Relations Plus (PACER Plus) which only includes a few provisions enabling paperless trade.<sup>21</sup>

<sup>20</sup> DTPs covering more than three of seven groups of distinct issues related to digital trade. Refer to the section on scope of digital trade provisions for details.

<sup>21</sup> For example, Article 6 of the PACER Plus encourages the use of automated customs systems.





**Figure 5.3**

PTAs with and without DTPs signed by Asia-Pacific economies<sup>22</sup>

## 3.2 Different approaches to digital trade

*“While the overall trend is to increasingly include digital trade in PTAs, countries are taking different approaches tailored to their own priorities.”*

A broad review of existing PTAs and the related literature suggests that influential trading partners have taken different approaches,<sup>23</sup> as summarized in table 5.1 below.<sup>24</sup> US-led PTAs provide the most comprehensive provisions on digital trade, covering emerging and core digital governance issues. In contrast, PTAs involving China generally address a smaller number of digital trade issues. However, both China and the United States have been adjusting their approaches. For example, when negotiating TPP, the United States had reserved non-

discrimination obligations to a smaller scope of application than in its previous FTAs.<sup>25</sup> In RCEP, China accepted provisions addressing cross-border transfer of information by electronic means and location of computing facilities, although with carve-outs and larger discretionary policy space.<sup>26</sup> Interestingly, the Singapore-China FTA (upgraded in 2019) applies the Chinese model, while the Singapore-European Union FTA (2019) uses the European Union’s model, which reflects the flexibility of Singapore in advancing international cooperation on digital trade.

*“US-led PTAs include the deepest commitments on digital trade liberalization, while China tends to take more cautious approaches. All countries keep adjusting their approaches, while Singapore tends to provide the most significant flexibility.”*



**Table 5.1** Different approaches to addressing digital trade in PTAs

### Different approaches taken by main trading partners

**United States approach:** the United States arguably has taken the most ambitious approach to addressing digital trade in PTAs, by providing for a broad scope of digital trade. The United States has been particularly ambitious on the liberalization of digital trade in services, it tends to extend commitments to cross-border trade in services produced, distributed, marketed, sold or delivered by electronic means. However, the United States is more cautious about financial services, and it tends to have special arrangements for cross-border financial services. United States-led PTAs tend to include comprehensive and deep provisions on the governance of data. The United States values free access to data and movement of data more than regulatory rights.<sup>27</sup>

<sup>23</sup> Henry Gao, ‘Data Sovereignty and Trade Agreements: Three Digital Kingdoms’ (2022), Hinrich Foundation at <https://www.hinrichfoundation.com/research/article/digital/data-sovereignty-trade-agreements-digital-kingdoms/>; Susan Ariel Aaronson and Patrick Leblond, ‘Another Digital Divide: The Rise of Data Realms and Its Implications for the WTO’ (2018) 21 *Journal of International Economic Law*, 245, at <https://academic.oup.com/jiel/article/21/2/245/4996295>; Henry Gao, ‘Digital or Trade? The Contrasting Approaches of China and United States to Digital Trade’ (2018a) 21 *Journal of International Economic Law* 297 <https://academic.oup.com/jiel/article/21/2/297/4996884>

<sup>24</sup> The approaches identified are based on the content of the following recent agreements in particular: CPTPP (2018), United States-Japan DTA (2019), USMCA (2020), European Union-Japan Economic Partnership Agreement (2019), European Union-Viet Nam FTA (2020), European Union-New Zealand FTA (expected to enter into force in 2023), Singapore-Australia DEA (2020), DEPA (Chile, New Zealand, and Singapore) (2021), Singapore-the Republic of Korea DPA (2023), China-the Republic of Korea FTA (2015), RCEP (2020), China-New Zealand FTA (upgraded 2022), Singapore-EU FTA (2019), Singapore-China FTA (upgraded 2019).

<sup>25</sup> Henry Gao, ‘Regulation of Digital Trade in US Free Trade Agreements: From Trade Regulation to Digital Regulation’ (2018b) *Legal Issues of Economic Integration* 45, No. 1: 47-70, [https://ink.library.smu.edu.sg/cgi/viewcontent.cgi?article=4511&context=sol\\_research](https://ink.library.smu.edu.sg/cgi/viewcontent.cgi?article=4511&context=sol_research)

<sup>26</sup> RCEP, Article 12.3, paragraphs 4 and 5, explicitly say measures affecting trade in services are subject to service chapter.

<sup>27</sup> See *Supra* note 18.



**Table 5.1.** (continued)

<p><b>European Union approach:</b> The European Union has underlined the link between cross border trade in services and digital trade, while it tends to include commitments in related service sections instead of the e-commerce section. The European Union provides fewer specific commitments on data-related issues, instead, it emphasizes regulatory cooperation for e-commerce. Notably, the European Union has special emphasis on personal data protection and protection of national treasures of artistic, historic or archaeological value – it tends to ensure these two priorities through exceptions. The European Union takes a very strong position, requiring the highest level of protection for personal data, which is seen by some other trading partners as a trade barrier, while it also forced some countries to enhance their domestic regulatory framework for personal information protection.</p>
<p><b>Singapore approach:</b> Singapore has been particularly active in negotiations on digital trade. It has formulated very comprehensive agreements dedicated to digital trade, including the first digital-trade-only agreement DEPA. Singapore is using and promoting its comprehensive model with similar coverage of topics and structure, while providing flexibility in bindingness and policy space. Moreover, Singapore tends to promote its model by starting from negotiations of bilateral agreements with like-minded developed partners – with small adjustments on language to provide stronger or weaker obligations. It is more flexible when negotiating with partners who may stick to their own models, such as the European Union and China.</p>
<p><b>China approach:</b> China has taken a cautious approach on digital trade by narrowing the scope of digital trade and focusing on enabling and facilitating trade in goods by electronic means. Even where services are mentioned, they are mainly ancillary services helping to facilitate goods trade. China tends to only make commitments on digital trade when it considers this to be necessary or feasible, and usually does not include additional obligations to the existing international obligations or practices. When negotiating tough issues, it tends to include additional conditions and/or exceptions to reserve policy space. China values the right to regulate more than digital liberalization, particularly, it prioritizes security interests and online content review.</p>

Source: ESCAP.

### 3.3 Growing scope of DTPs and increasing relevance to sustainable development

*“The most common DTPs are those enabling and facilitating trade digitalization. The wide coverage of the protection of consumers and data privacy also reflects common regulatory needs.”*

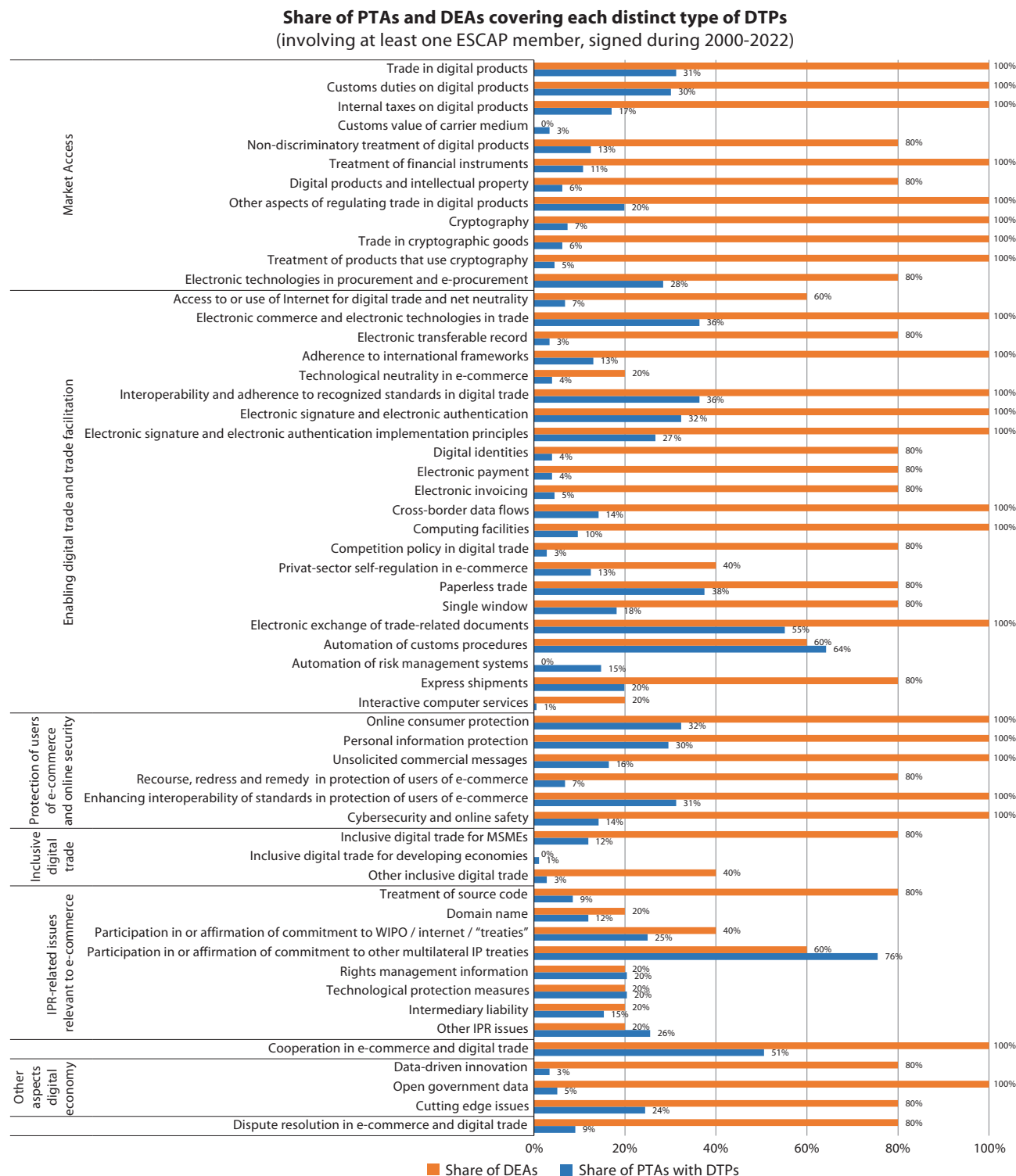
Figure 5.4 provides an overview of the overall thematic coverage of DTPs in all PTAs with at least one DTP and in all DEAs signed by Asia-Pacific economies. A larger share shown indicates that a thematic topic is more commonly addressed by PTAs and DEAs. The most commonly covered DTPs are those enabling and facilitating electronic means to achieve trade. Such provisions do not touch more sensitive topics such as the governance of data or deeper commitments on digital services. DTPs on the

protection of online consumers and personal information are also widely covered. However, the inclusion of DTPs on consumer protection and personal data protection does not mean that countries are taking the same or interoperable standards – a detailed review on specific provisions is needed to assess the extent of cooperation – as discussed in the following sections.

Figure 5.4 also reflects that DEAs (orange bars) have a far more comprehensive scope than PTAs (blue bars). Notably, despite provisions that would contribute to economic growth, DEAs incorporate more DTPs that would directly contribute to other aspects of sustainable development, such as inclusive digital economy. As such, the next section discusses the cooperation pursued through DEAs in more details.



**Thematic coverage of DTPs in PTAs and DEAs, signed by at least one ESCAP member during 2000-2022**



Source: ESCAP, based on results of mapping by ESCAP Trade Agreement Text Analysis Tool (<https://tiid.shinyapps.io/text-analysis-tool/>).

Note: Digital Economy Agreements (DEAs), Preferential Trade Agreements (PTAs), digital trade provisions (DTPs), intellectual property right (IPR). The PTA share represents the share of PTAs with each distinct type of DTPs out of PTAs with at least one DTP, not out of all PTAs.

### 3.4 Deep and novel cooperation through Digital Economy Agreements

*“‘Digital-only’ agreements have rapidly emerged to address a broader scope of emerging issues, including inclusive digital economy and sustainable development.”*

The DEA model differs from the approach taken in earlier PTAs. First, it broadens the scope of ‘e-commerce’ or ‘digital trade’ to ‘digital economy’ topics. DEPA and other DEAs provide a far wider range of settings aiming to leverage the full innovative potential of the digital economy. Second, DEAs include interesting new approaches to data governance, for example, providing a platform to build confidence and unlock collaboration on how to balance free data flows and public policy objectives. Further, DEAs extend the cooperation to co-designing rules and standards for emerging technologies such as artificial intelligence, digital identities, fintech, ‘regtech’ (regulatory technology) and data innovation. Last but not least, the DEA model incorporates inclusive digital economy and sustainable development, for example, the inclusion

of special treatment and cooperation for MSMEs and regional capacity-building (table 5.2).<sup>28</sup> In contrast, earlier PTAs have only included sustainable development issues, such as gender, to a limited extent (box 5.1). Another observation is while DEAs and the DEPA do not directly include references to boost investment in digital economy sectors, they are likely to indirectly, positively help increase investment particularly in areas related to digital adoption and digital businesses.

DEAs have started to transform the trade landscape and arguably paved the way for other innovative approaches to regional cooperation in the digital ecosystem.<sup>29</sup> The influence of DEAs on the larger players is starting to be visible: China submitted a request to join DEPA, the European Union is negotiating a DEA with Singapore, and there appears to be DEA-like elements to the United States-led Indo-Pacific Economic Framework (IPEF) negotiations.<sup>30</sup> The proliferation of – mostly bilateral – DEAs may, however, make digital trade more complex unless rules in these agreements are harmonized. The next section provides a comparative analysis of DTPs in selected important agreements to see whether there is an emerging coherence.



Mapping of sustainability related provisions in DEAs or other frameworks

Micro, small and medium-sized enterprises	<b>Information sharing:</b> Provision to ensure publicly accessible information that can be relevant or beneficial to MSMEs.
	<b>SME cooperation:</b> Provision to establish a cooperation framework to enhance trade and investment opportunities for SMEs in the Digital Economy through information exchange, MSMEs’ participation in government procurements, and MSMEs trade and investment platforms.
	<b>Digital SME dialogue:</b> Provision to establish a Digital MSME dialogue including private sector, non-government organisations, academic experts, and other stakeholders to promote relevant collaboration efforts and initiatives supporting MSMEs and digitalization.
Digital Inclusion	<b>Digital inclusion:</b> Provision to address barriers in accessing digital economy opportunities and promote digital inclusion, including through promoting access to digital infrastructure, and participation of women, rural populations, low socio-economic groups and Indigenous Peoples in the digital economy.
	<b>Women participation in digital trade:</b> Provision to facilitate participation by women and women-led enterprises in digital trade through cooperation, information sharing and technical assistance.
	<b>Digital skills development:</b> Provisions to address digital skill gaps and provide capacity-building to improve digital literacy skills training.

<sup>28</sup> Stephanie Honey, 2023, ‘The Long Road to a Seamless Global Digital Economy’, Hinrich Foundation <https://www.hinrichfoundation.com/research/article/digital/the-long-road-to-a-seamless-global-digital-economy/>

<sup>29</sup> ‘Digital Economy Agreements Are a New Frontier for Trade – Here’s Why’ (World Economic Forum, 24 August 2022). See <https://www.weforum.org/agenda/2022/08/digital-economy-agreements-trade/>

<sup>30</sup> See *supra* note 23.

**Table 5.2.** (continued)

<b>Innovation</b>	<b>Public domain:</b> Provision to recognize the importance of accessible public domain and publicly accessible databases for the development of the digital and knowledge-based economy.
	<b>Open government data:</b> Provision to facilitate public access to and use of open government information to foster economic and social development, competitiveness and innovation.
<b>Transparency</b>	<b>Publication:</b> Provision to ensure that laws, regulations, procedures and administrative rulings related to digital trade and digital economy are promptly published or otherwise made available to access by interested persons.
	<b>Administrative proceedings:</b> Provision to ensure that related persons are provided with prior notice and reasonable opportunity to present facts and arguments in support of their positions in an administrative proceeding ("right to be heard").
	<b>Review and appeal:</b> Provision to establish or maintain independent judicial, quasi-judicial, or administrative tribunals, or procedures for the purpose of the prompt review and correction of final administrative actions regarding matters related to digital trade or digital economy.

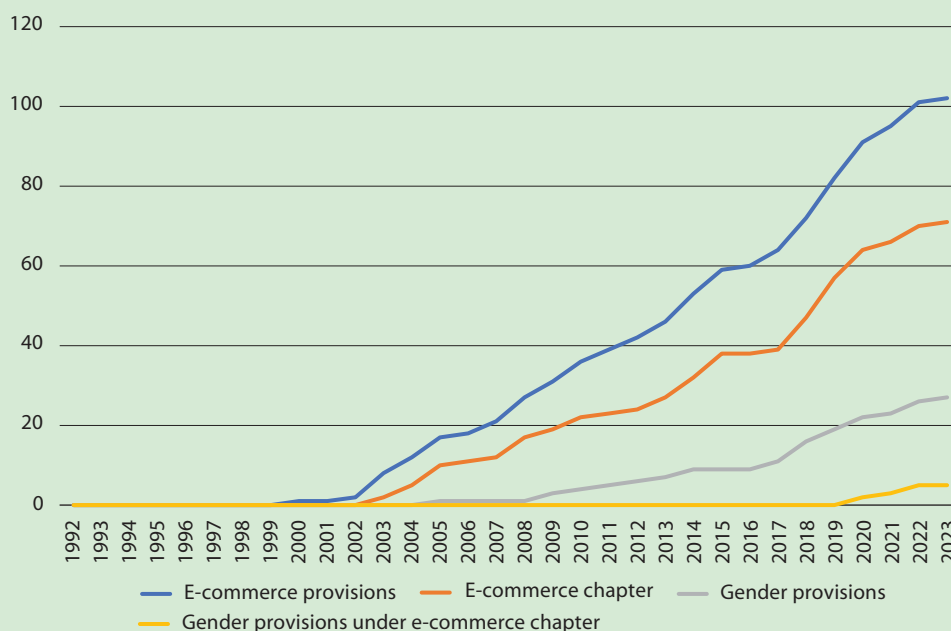
Source: Baker and Le (forthcoming).



### Gender provisions in PTAs in the Asia-Pacific region

As of 2023, out of 71 PTAs with dedicated chapters on e-commerce or digital trade, only five have provisions related to gender (figure). Furthermore, only four agreements feature a standalone chapter on Gender. Three of these agreements are bilateral between the United Kingdom and developed Asia-Pacific partners (Australia, Japan, and New Zealand). Another is the Singapore-Pacific Alliance FTA. These gender-related provisions or chapter typically emphasize cooperation, yet they often lack specific commitments and enforcement mechanisms.

#### E-commerce and gender-related provisions in Asia-Pacific PTAs, 1992-2023



Source: ESCAP, based on the APTIAD Database (<https://www.unescap.org/content/aptiad>).

### 3.5 Promoting coherence in digital trade rules

A lack of consistent rules on digital trade in PTAs may undermine the benefits associated with digital trade, especially for smaller traders and economies. Table 5.3 provides a comparison of DTPs in selected PTAs and DEAs.<sup>31</sup> It shows which agreements include provisions in each of the key issue areas mentioned earlier. It also indicates the strength of each provision, based on the level of bindingness, the specificity of the language and the exceptions provided. Stronger strength represents more legally binding obligations and/or deeper commitments; however, it does not necessarily indicate that the provision is better than weaker ones as the softer language provides more policy space.

*“Despite increasing consistency in terms of issues covered, legal language used to address them substantially differs across agreements.”*

There is a significant overlap in the coverage of core DTPs across the agreements, particularly in DEAs. Notably, there appears to be some consistent commitments, including: no customs duties on electronic transactions; promoting paperless trade; application of UNCITRAL instruments for electronic transactions; reducing restrictions on cross-border data flow and location of computing facilities, and

enhancing the protection of online consumer, personal data and cybersecurity. This reflects a potential coherence, despite the different levels of bindingness across agreements.

Despite the emerging consistency in coverage, DTPs can still be very different in creating obligations, allowing for different degrees of policy space. For example, the provision on cross-border transfer of information by electronic means in DEPA, KSDPA, CPTPP, and RCEP have nearly identical structure with very similar text. However, the slight differences in legal language result in very different levels of bindingness (see table 5.4 below).

*“Any regulatory coherence achieved within the Asia-Pacific region will aid in the development of a multilateral consensus on digital trade rules.”*

The Asia-Pacific region stands out as a leader both in regional and global digital trade negotiations. The two mega-regional agreements (CPTPP and RCEP) have particularly influential roles. Furthermore, many Asia-Pacific economies are actively participating in negotiations under the WTO JSI. Consequently, any regulatory coherence achieved within or in association with the Asia-Pacific region will substantially aid in the development of a multilateral consensus on digital trade rules.

<sup>31</sup> This extends the analyses done by Deborah Elms, Overview of digital trade provisions in Asian agreements (2021). See <https://www.unescap.org/sites/default/d8files/event-documents/guest%20speaker%20presentation%20-%20Deborah%20Elms.pdf>, and Dan Ciuriak 2022, c. 25. See also Du et al. (2023).



Comparison in coverage and strength of selected DTPs in trade agreements

Key issue area	Core digital trade provisions (DTPs)	DEAs				PTAs			
		USJPDPA (2019)	ASEAN AEC (2019)	ASDEA (2020)	DEPA (2021)	USMCA (2020)	EU-VN FTA (2020)	CPTPP (2018)	RCEP (2020)
Openness and market access	No customs duties on electronic transmissions	✓	✗	✓	✓	✓	✓	✓	✓
	Non-discrimination of digital products	✓	✗	✓	✓	✓	✗	✓	✗
	Cross-border trade in services by electronic means	✓	✗	✓	✓	✓	✓	✓	✗
Enabling and facilitating digital trade	Electronic authentication and signatures	✓	✓	✓	✗	✓	✗	✓	✓
	Paperless trading	✗	✓	✓	✓	✓	✓	✓	✓
	Electronic invoicing	✗	✗	✓	✓	✗	✗	✗	✗
	Electronic payment	✗	✓	✓	✓	✗	✗	✗	✗
	Domestic regulatory framework for electronic transactions	✓	✓	✓	✓	✓	✗	✓	✓
	Access to and use of the Internet and interconnection	✗	✗	✓	✓	✓	✓	✓	✗
	Cross-border transfer of information by electronic means / cross-border data flows	✓	✓	✓	✓	✓	✗	✓	✓
Data governance	Location of computing facilities	✓	✓	✓	✓	✓	✗	✓	✓
	Open government data	✓	✗	✓	✓	✓	✗	✗	✗
	Online consumer protection	✓	✓	✓	✓	✓	✗	✓	✓
Trusted digital trade and protection	Personal information protection	✓	✓	✓	✓	✓	✓	✓	✓
	Unsolicited commercial electronic messages	✓	✗	✓	✓	✓	✗	✓	✓
	Source code	✓	✗	✓	✗	✓	✗	✓	✗
	Cybersecurity	✓	✓	✓	✓	✓	✓	✓	✓
	National treasures of artistic, historic or archaeological value	✗	✗	✗	✗	✗	✓	✗	✗
	MSMEs	✓	✓	✓	✓	✓	✗	✓	✓
Deep cooperation	Digital identities	✗	✗	✓	✓	✗	✗	✗	✗
	Standards, technical regulations and conformity assessment for digital trade	✗	✗	✓	✗	✗	✓	✓	✗
	Artificial intelligence	✗	✗	✓	✓	✗	✗	✗	✗
Emerging tech-nologies	Data innovation	✗	✗	✓	✓	✗	✗	✗	✗
	Financial Technology Cooperation	✗	✗	✓	✓	✗	✗	✗	✗
Dispute settlement	Whether dispute settlement is applicable?	✗	✓	✓	✓	✓	✓	✓	✗

The strength of the provision is denoted by: the colour from dark to light = from strong to weak. The strong or weak level of strength does not mean to make judgment about good or bad.

Source: ESCAP.

Note: ASEAN Agreement on Electronic Commerce (ASEAN AEC), European Union-Japan Digital Trade Agreement (EUJPDPA), Australia-Singapore Digital Economy Agreement (ASDEA), Digital Economy Partnership Agreement (DEPA, between Chile, New Zealand, and Singapore), European Union-Viet Nam Free Trade Agreement (European Union-VN FTA), Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP), Regional Comprehensive Economic Partnership (RCEP). The strength of each provision is assessed holistically based on the level of bindingness, the specificity of the language, and the exceptions provided.





**Provisions on ‘cross-border transfer of information by electronic means’ in selected trade agreements**

PTA	Article No.	Cross-border transfer of information by electronic means	Including personal information	Limitation on regulatory requirements	Non-binding note*	Exceptions for legitimate public policy objectives	Special exception for essential security interests	discretionary language**	Level of bindingness
DEPA	4.3	shall allow	✓	✗	✓	✓	✗	✗	
KSDPA	14.14	shall not prohibit or restrict	✓	✓	✗	✓	✗	✗	
CPTPP	14.11	shall allow	✓	✗	✗	✓	✗	✗	
RCEP	12.15	shall not prevent	✗	✗	✓	✓	✓	✓	
*DEPA explicitly stipulates in its annex said Article 4.3 does not create any rights or obligations. RCEP provides carve-out for certain parties in a certain period of time.									
**RCEP explicitly uses ‘it considers necessary’ and ‘shall not be disputed by other Parties’ to give more policy space.									

Source: ESCAP, based on textual review of the analysed agreements.

Note: Digital Economy Partnership Agreement (DEPA), between Chile, New Zealand and Singapore), the Republic of Korea-Singapore Digital Partnership Agreement (KSDPA), Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP), Regional Comprehensive Economic Partnership (RCEP).

## 4. CONCLUSION

*“Engagement in digital trade cooperation across the region is growing but unequal.”*

Although a large group of WTO members are having conversations on digital trade under the JSI, regional and preferential agreements remain the main channel for the formulation of digital trade rules, especially for emerging issues. Including DTPs, if not entire chapters on digital trade (or e-commerce), in PTAs is becoming the norm rather than the exception in Asia and the Pacific. East and South-East Asia countries are prominent in incorporating DTPs in their trade agreements, while Central Asia and South Asia countries are lagging behind. Countries in Central Asia and South Asia may consider enhancing intra-subregional cooperation on digital trade, building on existing PTAs to agree on DTPs that would support their digital transformation efforts. ESCAP analysis suggests that such DTPs need not be binding to be effective. Softer rules would provide the policy space needed to deal with a rapidly evolving digital trade environment, also enabling the participation of less advanced economies.

*“Asia-Pacific economies are taking the lead in signing DEAs, often bilaterally. Creating a new ‘noodle bowl’ of inconsistent agreements should be avoided.”*

The most common DTPs found in PTAs are those enabling and facilitating trade digitalization and paperless trade. Other common commitments across PTAs include: imposing no customs duties on electronic transactions, reducing restrictions on cross-border transfer of data, and protecting personal information. Although legal language differs across agreements, the most common commitments across agreements have the potential to shape some universally applicable disciplines. The more advanced Asia-Pacific economies, especially Singapore, are taking the lead in signing DEAs. The recent surge in signing dedicated DEAs provides a novel, useful and flexible approach to negotiations on digital trade. DEAs include a wider range of DTPs addressing key and emerging issues of digital trade. However, creating a new “noodle bowl” of inconsistent agreements should be avoided. The growing number of bilateral DEAs may make the digital trade environment unnecessarily complex, in particular for smaller firms in developing economies. Plurilateral approaches, as in DEPA, should be preferred.

*“More comprehensive and tailored digital trade provisions have the potential to contribute more to sustainable development.”*

Besides boosting economic growth by liberalizing and facilitating cooperation in digital trade, DTPs also have positive impacts on addressing environmental and social challenges. The more comprehensive

DTPs are usually associated with deeper cooperation and more specific arrangements for implementation, thus would be more likely to help reach sustainable development. Moreover, more recent DEAs are increasing incorporating DTPs that are dedicated to sustainable development, such as provisions related to inclusive digital economy. Being aware of the trend of linking digital trade and sustainable development, countries, especially less-developed countries, need to keep abreast of these negotiations and be clear about their own needs. For example, less-developed countries could stress the importance of DTPs on the inclusion of MSMEs in digital trade, capacity-building and transfer of digital technologies among other topics to reduce the digital divide.

*“For the most sensitive issues, for example, data governance, voluntary mechanisms may offer promising regional solutions.”*

Some DTPs are more controversial than others. For example, there is broad consensus on DTPs on paperless trade facilitation but less so on DTPs related to data governance. Before the signing of the DEPA in 2020, which introduced a modular approach allowing joining countries to accept different levels of commitments, the ASEAN Digital Data Governance framework, endorsed in 2018, established a voluntary mechanism that considers the variations in data governance and digital capabilities among countries (box 5.2). The use of progressive and/or voluntary

commitments is a good strategy for less-developed countries when negotiating DTPs, particularly since they will also often need time to enhance domestic legislation on digital economy-related issues, such as online consumer protection, personal information protection, and internal electronic transactions.

*“Building upon existing international standards and agreements is key to accelerating cooperation and enhancing consistency in digital trade regulations.”*

Looking ahead for deeper cooperation and closer integration in digital trade, legal and technical interoperability need to be promoted. To enhance interoperability, countries should refer to and build upon existing international standards and instruments when developing their domestic regulatory environment. For example, countries are encouraged to adopt the existing UNCITRAL model laws related to electronic commerce as well as relevant UN/CEFACT technical standards for electronic business. Similarly, at the multilateral and regional level, countries should also actively participate in existing multilateral or regional cooperation frameworks and agreements, before considering creating new ones. For instance, the UN treaty called the Framework Agreement on Facilitation of Cross-border Paperless Trade in Asia and the Pacific (CPTA) already provides an inclusive and neutral platform for the pilot testing of cross-border paperless trade solutions among over 50 member

## Box 5.2

### The ASEAN Framework and other voluntary approaches to data governance

The ASEAN Framework on Digital Data Governance utilizes two primary methods: First, certification of organizations and businesses demonstrating compliance with national data protection laws as well as reliable and effective data management practices. Second, Model Contractual Clauses (MCCs), which are contractually enforceable data transfer agreements ensuring the full protection of personal data when transferred to an overseas territory (UNDP, 2021).

Other voluntary mechanisms that can aid in achieving interoperability and facilitating cross-border data flows are Binding Corporate Rules (BCRs) and Codes of Conduct. BCRs require enterprises to adhere to data protection protocols when transferring personal data between corporate groups within and across borders. Similarly, Codes of Conduct, developed by professional societies, allow participating members to voluntarily adopt specific data protection provisions. For example, an international scientific consortium has advocated for an international code of conduct, led by scientists themselves, which offers greater flexibility for updates compared to the slower process of developing national and international laws (Phillips and others, 2020).

states, enabling harmonization of electronic trade data and document exchange rules and systems currently being developed only at the bilateral or subregional levels. Such agreements and frameworks may be directly referred to in relevant DTPs. At the global level, active participation in the on-going WTO

JSI discussions on e-commerce, as well as in initiatives such as the UNCTAD-led E-trade For All capacity building initiative should be positively considered, with the ultimate goal of achieving an inclusive digital trade environment supportive of the sustainable development goals.

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CHAPTER



# Sustainability impact of ICT goods trade and digital trade-related policies




This chapter uses computable general equilibrium modelling (CGE) to examine the impact of various digital trade-related policies. Policies considered include those captured by OECD's digital trade restrictiveness index, Information Technology Agreement (ITA) I and II as well as implementation of digital trade facilitation improvements.

## 1. BACKGROUND

Digital technologies are reshaping global supply and demand, including by helping to reduce trade costs (Smeets, 2021; WTO, 2018). While the contribution of digital services to global trade is not well understood (WTO, 2019), the impacts of policy changes are likely to be large. For example, a recent study found the increase in digital trade barriers from 2014 to 2018 caused Chinese manufacturing exports to drop by more than 2% (Jiang and others, 2022).

While digital trade is becoming increasingly important, formal modelling of the impact of digital trade, including using global computable general equilibrium (CGE) analysis, has been limited to date. Some early work was undertaken estimating negative performance outcomes resulting from data regulation, which were then implemented in the Global Trade Analysis Project (GTAP) model, suggesting that requirements such as digital localization may have a greater impact on trade flows, investment and welfare than traditional trade barriers (Van der Marel and others, 2016).

 *“More research is needed to understand the impact of digital policies.”*

Other early work indicates that the impact of digital technologies is likely to have a significant effect on trade (Bekkers and others, 2021), but this may vary substantially across regions and sectors. A global CGE model has also been used to examine the impact of levying customs duties on electronic transmissions (Makiyama and Narayanan, 2019); and recent work has been undertaken using a similar global modelling framework to assess the impacts of a Digital Economy Agreement (DEA),<sup>1</sup> suggesting that DEAs will positively increase the output of the ICT sector, with benefits for other downstream sectors (Lim and Xie, 2022). Sheperd (2022), under the

assumption of reducing existing iceberg trade costs in digitally delivered sectors by 10%, uses CGE modelling to demonstrate the positive spillover effects on other sectors, noting that future research is needed to estimate the actual impact of changes in digital restrictiveness, as this study aims to do.

Against this backdrop, this chapter uses the GTAP model (Corong and others, 2017; Hertel and Tsigas, 1997) and the latest version 11 of the GTAP database, with a baseline year of 2017 (Aguiar and others, 2022). This report uses databases on digital services restrictions, including from the OECD, to explore the impacts of regulatory cooperation and lower trade restrictions on digital trade-related goods and services among different groups of economies, with a particular focus on Asia-Pacific economies. Modelling mechanisms that aim to represent the policy changes as appropriately as possible are used (Walmsley and Strutt, 2021). A range of potential impacts are analysed, including GDP, trade, sectoral effects and CO<sub>2</sub> emissions.

## 2. DIGITAL TECHNOLOGIES, EFFECTS ON PRODUCTIVITY AND BARRIERS TO TRADE

Villafuerte, Narayanan and Abell (2021) examine the macroeconomic impact of digital marketplaces and digital technology, with the results based on an assumption that there would be a 20% global increase in the digital sector size by 2025. It is also assumed that the use of greater digital inputs would increase total factor productivity growth by 2%. The assumption is based on the premise that “the expansion in the digital sector will boost total factor productivity in the economy”. However, is there empirical evidence showing that a link between the digital sector and TPF?

 *“The impact of ICTs on productivity is gradual and relies on early tech adoption.”*

Van Ark (2016) notes that despite a rapid increase in business spending on capital and services in Information and Communication Technology (ICT), the New Digital Economy (mobile technology, the Internet, and Cloud) has not yet generated any visible improvement in productivity growth. Indeed,

<sup>1</sup> See <https://www.mti.gov.sg/Trade/Digital-Economy-Agreements>

total factor productivity in developed economies, such as the United States and the European Union, has shown a weak growth rate (Inklaar and others, 2019; van Ark and others, 2018), despite the contemporaneous effect of the digital revolution. Surprisingly, industries which are the most intensive users of digital technology have been responsible for the largest part of the slowdown in productivity growth in the United States, the United Kingdom and Germany (Van Ark, 2016). The author argues that this effect is due to declining ICT prices, the rise of ICT services (in lieu of ICT assets) in business spending and continued investment in knowledge-based assets, which the author compares to R&D that has yet to pay dividends. Indeed, the author concludes that the new digital economy is in the “installation phase” and productivity will grow once it is in the “deployment phase”.

*“Many of the benefits offered by ICTs and digital technologies are not well-captured by traditional measures, such as GDP.”*

Supporting this hypothesis, Tranos, Kitsos and Ortega-Argilés (2021) found that early adoption of online content creation increased regional productivity levels in the United Kingdom up to 16 years later. In addition, many benefits are not accounted for by traditional measures – free content online is bypassed altogether – but average consumers are much better off with these services than suggested by GDP per capita figures compared across time. Conversely, the adoption of ICT can occasionally hinder economic development, such as by diminishing long-term employment growth due to automation or by diverting focus away from the manufacturing sector (Rodrik, 2016) or through cannibalizing pre-existing non-digital processes (Remes, Mischke and Krishnan, 2018). Indeed, some studies show that the effect of greater connectivity negatively affects exporting firms in lower-income economies (Rodrik, 2016).

*“Stricter data policies lead to reduced imports of data-intensive services, affecting crucial production inputs and efficiency gains in poorer countries.”*

Beyond affecting productivity, theory suggests that placing various digital restrictions would reduce trade in sectors that rely on digital or digitally-aided

delivery, primarily in services. As expected, when exploring the potential effects of data policy restrictions on the trade of services, Ferracane and Marel (2019) found that more restrictive data policies, particularly with regard to the cross-border movement of data, result in lower imports in data-intensive services for countries imposing them. The authors note that developing countries may wish to limit such imports to establish expertise and specialization in industries in which they subsequently can export or participate in value chains. However, data and data-intensive services are important inputs for downstream sectors, also for manufacturing. When efficiently supplied, they help countries develop. Strict data policies may therefore reduce the opportunity for poorer countries to reap efficiency gains and ultimately grow.

### 3. DIGITAL TRADE RESTRICTIVENESS

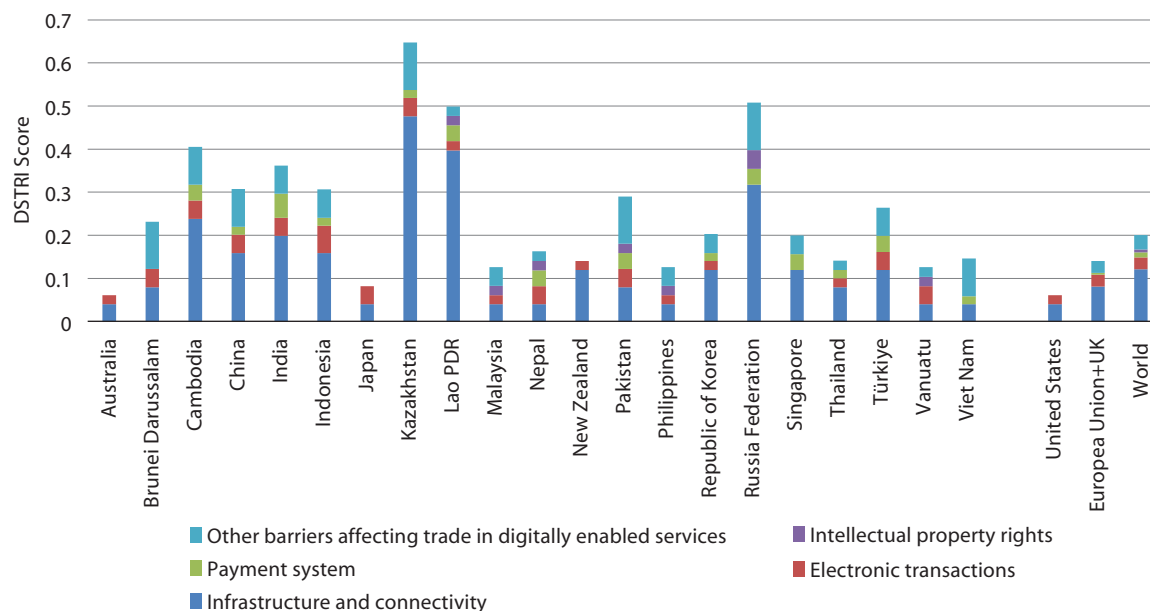
López González and others (2023) provide a comprehensive overview of the evolving nature of digital trade and the policies that govern it. The authors highlight the rapid growth of digital trade compared to traditional “non-digital” trade. By 2018, digital trade accounted for approximately 24% of global trade, equivalent to US\$ 5.1 trillion. This exponential growth has prompted countries to incorporate digital trade provisions into their trade agreements, leading to the emergence of new digital economy agreements. Through empirical analysis, the authors demonstrate that digital connectivity yields a double dividend by boosting both domestic and international trade. Furthermore, they reveal that the inclusion of digital trade chapters in trade agreements has the potential to double the impact of these agreements. In addition, they find the reduction of domestic barriers that hinder digital trade has a significant export-enhancing effect, particularly in digitally-deliverable services. These findings underscore the crucial role played by digital connectivity and digital trade policies in reducing trade costs and fostering trade across countries at all levels of development.

*“The impact of digital services trade barriers is not limited to digitally delivered goods and services, but also other goods and services.”*

The authors use the OECD Digital Services Trade Restrictiveness Index (DSTRI) to estimate the impact of digital trade restriction policies on imports.



**OECD Digital Trade Restrictiveness Index in the Asia-Pacific region and major trade partners, 2022**



Source: ESCAP, based on the OECD DSTRI ([https://stats.oecd.org/Index.aspx?DataSetCode=STRI\\_DIGITAL](https://stats.oecd.org/Index.aspx?DataSetCode=STRI_DIGITAL)) (accessed May 2023).

Notably, the authors find that the impact of a reduction in such barriers is not limited to digitally ordered and delivered goods and services, but also has an impact on other goods and services. The authors estimate that a 0.1 point reduction in DSTRI leads to a 145% increase in overall trade.<sup>2</sup>

The OECD DSTRI includes five areas: (1) infrastructure and connectivity; (2) electronic transactions; (3) e-payment systems; (4) intellectual property rights; and (5) other barriers to trade in digitally enabled services (Ferencz, 2019) (figure 6.1).

As per figure 6.1, the global average DSTRI score is 0.2, with significant variation among countries in the Asia-Pacific region. Notably, with the exception of Australia, all Asia-Pacific economies captured by OECD's data collection exercise have DSTRI scores

greater than that of the United States. The infrastructure and connectivity component is responsible for the bulk value of scores in most economies.

*"The vast majority of Asia-Pacific economies captured by OECD's data collection exercise have DSTRI scores greater than that of the United States."*

For the purposes of this study, when modelling changes in digital trade restrictiveness, only indicators within the "Infrastructure and connectivity" area related to cross-border data flows were considered.<sup>3</sup> In particular, the specific cross-border data flow indicators considered in this study are summarized in table 6.1.

<sup>2</sup> Note that 0.1 is quite an important reform reflected through the DSTRI. For example, a change from a more restrictive approach to data flows to a more standard approach would lead to a 0.04 point change in the DSTRI. A 0.1 point change in the DSTRI would nearly triple the overall DSTRI score for countries like the United States or the United Kingdom and many other OECD countries, noting that the average of the DSTRI for the database with 100 economies is around 0.21.

<sup>3</sup> The effects of digital trade restrictiveness are likely to be non-linear in nature. As such, since AVE estimates in López González and others (2023) were derived through fixed effects regressions of panel data, they only capture the marginal effect of small variations across time – the range of five-year change of the overall DSTRI was between -0.3 to 0.22, meaning that changes involving larger magnitudes are not captured by the estimation process. Limiting estimation to cross-border data flows along is within the variation as the maximum value of the necessary reduction in the dataset is only 0.16.



**Cross-border data flow-related indicators<sup>4</sup>**

7_1_1	Discriminatory conditions for licences to engage in e-commerce.
6_7_6	Cross-border data flows: transfer of data is prohibited.
6_7_5	Cross-border data flows: certain data must be stored locally.
6_7_4	Cross-border data flows: cross-border transfer is subject to approval on a case by case basis.
6_7_3	Cross-border data flows: cross-border transfer of personal data is possible for countries with substantially similar privacy protection laws.
6_7_2	Cross-border transfer of personal data is possible when certain private sector safeguards are in place.

Source: ESCAP, based on the OECD DSTRI ([https://stats.oecd.org/Index.aspx?DataSetCode=STRI\\_DIGITAL](https://stats.oecd.org/Index.aspx?DataSetCode=STRI_DIGITAL)) (accessed May 2023).

## 4. INFORMATION TECHNOLOGY AGREEMENTS I AND II

The WTO's Information Technology Agreement (ITA) was the first multilateral agreement signed under the auspices of the WTO in 1996, with membership growing from just 29 WTO members to 83 in 2023. The Agreement sought to eliminate tariffs on products in the IT sector, such as computers, telecommunication equipment, semiconductors, software,<sup>5</sup> scientific instruments etc., as well as their components. The main stated rationale behind the Agreement was the understanding that the IT sector spurs innovation, as well as socio-economic growth, and contributes to various other aspects of sustainable development. Indeed, many MDGs and later SDGs could be directly and indirectly impacted by the IT sector, and certain targets and indicators themselves make clear mention of it, such as Internet connectivity.

ITA has been successful in eliminating tariffs in participating economies on the targeted products,

prompting a discussion to expand the scope of products beyond the initial list. This eventuated in the ITA "Expansion List" with additional products, to which now 54 WTO members have signed up. Notably, most recent signatories to ITA and ITA II have been due to either WTO or European Union accession, or a requirement for an FTA with the United States (Henn and Gnutzmann-Mkrtchyan, 2015). The Lao People's Democratic Republic is the latest country to join both agreements (WTO, 2022), and Timor-Leste recently formally applied to join both (WTO, 2023). Empirical evidence from outside of the region suggests that accession to ITA may have increased GDP in the medium term by 0.17% in Brazil and 0.05% in Argentina, but at a cost to the competitiveness of the domestic IT industry and tariff revenue.<sup>6</sup>

It is also suggested that lower prices for IT goods arising from accession to the ITA can lead to growing competitiveness across a range of sectors, including in primary activities but also in services and manufacturing.

Notably, ITA contains a commitment to address non-tariff barriers in trade of the included goods (WTO, n.d.). However, aside from consultations, little has been achieved and no agreement has been reached on addressing them.

*"In 2021, products in ITA I and II lists accounted for more than 20% of total global imports, with an overwhelming majority of these imports being traded among ITA I and II participating member states."*

In 2021, global imports of products in ITA I and II lists were valued at US\$ 3.7 trillion and US\$ 500 billion, respectively. When combined, this represents more than a fifth of total global imports. Ninety-four per cent of imports of goods in ITA I list were to ITA I members, and 76% of goods in ITA II list were to ITA II signatories.

<sup>4</sup> Notably the overall score is not a simple calculation of Yes/No indicators but conditional on other answers, see <https://sim.oecd.org/Default.ashx?lang=en&ndds=DGSTRI>, with the maximum value for this component being 0.22 (out of 1 – most restrictive possible DSTRI score).

<sup>5</sup> Noting at that time it was primarily traded as "hard copies".

<sup>6</sup> See [https://www.oecd-ilibrary.org/sites/0b046dfe-en/1/3/3/index.html?itemId=/content/publication/0b046dfe-en&csp\\_=882ab91af41706069f08825388dc3e67&itemIGO=oecd&itemContentType=book](https://www.oecd-ilibrary.org/sites/0b046dfe-en/1/3/3/index.html?itemId=/content/publication/0b046dfe-en&csp_=882ab91af41706069f08825388dc3e67&itemIGO=oecd&itemContentType=book)



*“Not all economies have benefited equally from ITA I and II membership, and lagging economies should enact regulatory reforms and support policies.”*

Henn and Gnutzmann-Mkrtchyan (2015) demonstrated that joining the ITA has increased imports and exports through tariff reductions. However, not all economies have benefited equally, and trade liberalization may have negative effects for industries unprepared for technological competition. To bridge the gap, lagging economies should enact regulatory reforms and support policies to enhance their capabilities, while also removing investment barriers to foster ICT growth, innovation and overall welfare (WTO, 2017).

## 5. SCENARIOS

To explore the potential impacts on the Asia-Pacific region of the implementation of trade-related and digital trade policies, the well-known Global Trade Analysis Project model (GTAP) was used (Hétel and Tsigas, 1997; Corong and others, 2017), along with the GTAP 11 database (Aguar and others, 2022) including CO<sub>2</sub> emissions.<sup>7</sup> This approach enables the capture of intersectoral and international linkages within a consistent framework. This report focuses on the analysis in the Asia-Pacific region, including exploring the differential impacts on real GDP, emissions and trade as well as examining broad sectoral impacts to draw insights into the sectors likely to be most heavily impacted by these policies. Due to the current paucity of empirical evidence supporting the notion that ICT and digital trade in services in general affect productivity, the present

study does not aim to estimate these effects through further liberalization or other related policies. It models seven scenarios which attempt to capture the effects, without dynamic productivity effects.

The first four scenarios, dubbed “trade policy scenarios”, are related to tariff and non-tariff liberalization applied to products covered under ITA I and II.

In the first and second scenarios, this report models the liberalization of tariffs in ICT goods<sup>8</sup> on imports into the Asia-Pacific region. The reductions are largest under ITA II and primarily in the computer equipment sector. This is due to the fact that more countries have already implemented cuts to products covered under the ITA I Agreement. However, the tariff cuts are generally relatively small and only have an impact on a few sectors in a few countries.<sup>9</sup>

The third and fourth scenarios consider the impact of reductions in NTBs on all imports into the Asia-Pacific region as well as the United States, EU27 and the United Kingdom, based on ad valorem equivalent (AVEs) estimates of non-tariff measures (NTMs)<sup>10</sup> (Kravchenko and others, 2022). In particular, in scenario 3 this report models the impacts of a 10%<sup>11</sup> reduction in the AVE of non-technical NTMs corresponding to ITA I.<sup>12</sup> In Scenario 4, the report applies the same 10% reduction in non-technical NTMs, but now to ITA II goods.<sup>13</sup>

In the last three scenarios, dubbed collectively as “digital policy scenarios”, this report models the impact of digital trade restrictions changes and digitalization of trade procedures.

<sup>7</sup> The model is solved using GEMPACK software (Harrison and others, 2014).

<sup>8</sup> HS codes at six-digit level in ITA I and II were matched to GTAP sectors using imports in 2017 (GTAP base year) as weights for applied tariff calculations sourced from World Bank WITS and WTO tariff databases. See annex table 3 for GTAP sector aggregation used in the simulations.

<sup>9</sup> Average trade-weighted tariffs for goods covered under ITA I and ITA II in the Asia-Pacific region were calculated to be 0.42% and 0.97%, respectively.

<sup>10</sup> Technical NTMs such as sanitary and phytosanitary measures and technical barriers to trade are often linked to public policy objectives, such as consumer safety, environmental goals etc. Non-technical measures, such as licensing, excise taxes, etc, are primarily of commercial measures and therefore can be considered as NTBs. For more information, refer to ESCAP and UNCTAD (2019).

<sup>11</sup> This conservative reduction is in line with current approach of modelling a hypothetical reductions of trade costs associated with NTMs in CGE modelling.

<sup>12</sup> The (trade-weighted) average number of technical not-tariff measures facing imports (prevalence score) of goods covered by ITA I and ITA II by Asia-Pacific economies was 2.21 and 2.12, respectively. The average for the same products is 0.42 and 0.65 measures outside of Asia-Pacific, respectively. Trade-weighted AVEs of these NTMs in Asia-Pacific were estimated to be 5.47% and 10.44% for ITA I and ITA II goods, respectively, and 2.03% and 3% outside of Asia and the Pacific.

<sup>13</sup> We referred to non-technical NTMs as NTBs, following ESCAP and UNCTAD, 2019.

For the fifth scenario, this report simulates the average annual impact of estimated changes in DSTRI. It uses AVEs from López González and others (2023) and corresponding countries' DSTRI scores to estimate the average annual impact of DSTRI changes for each country or region modelled in the five years since 2017 (the GTAP base data year). The changes range from zero for North America to an average annual increase of more than 1.2% for North and Central Asia, driven largely by the average annual increase in the Russian Federation of approximately 1.4%. While these regional differences will drive regional differences in results, there is also sectoral differentiation as the average annual DSTRI score changes are combined with sectoral AVE estimates for changes in the index.

For the sixth scenario, the impact of liberalization of trade in selected cross-border data flows was modelled. In particular, this report considers the impact of a 10% change in these measures for imports from all trading partners into the Asia-Pacific region.<sup>14</sup>

In both the fifth and sixth scenarios, the changes in DSTRI for each country are combined with the sectoral AVE estimates for changes in the index, enabling the report to model the impacts differentiated by country and sector. These overall sectoral AVE estimates are based on estimates of reducing the domestic DSTRI by corresponding economy-level changes (average the actual five-year annual change of DSTRI in scenario five, while for scenario six it is a hypothetical 10% reduction in the latest DSTRI score of cross-border data flow indicators from López González and others, 2023).

Finally, in scenario seven this report uses country-level AVEs of the impact of full implementation of digital trade facilitation measures on trade costs (Duval, Utokham, Kravchenko, 2018).<sup>15</sup> These AVEs allow us to estimate the impact of lower trade costs (due to hypothetical full implementation of digital trade facilitation implementation) on economy, trade, employment and emissions.

The tariff reductions in scenarios one and two are modelled through appropriate reductions in tariffs. In all other scenarios, since the changes in trade barriers may have an impact both on exporters and importers, modelling mechanisms that target both (Walmsley and Strutt, 2021).

## 6. RESULTS

These simulations have a range of impacts at the global, regional and individual country levels. The following focuses first on overall impacts on the Asia-Pacific region and subregions, before analysing more detailed sectoral and employment effects.

## 7. GDP, TRADE AND EMISSION IMPACTS IN ASIA-PACIFIC

*“ITA I and II products tariff reductions have negligible impact on GDP but boost trade for South and South-West Asia.”*

The impact on GDP from tariff reductions is negligible, largely because most major trade economies in the region have already implemented ITA I and II product tariff cuts (figure 6.2). With regard to trade, however, there is potential to boost trade a little for the South and South-West Asia subregion, and, to a lesser extent, the North and Central Asia subregion, particularly for goods covered under ITA II. However, figure 6.2 demonstrates that the main potential gains in trade and GDP from products covered under both agreements come from addressing NTBs, suggesting these should be a trade policy priority in the negotiations. The pattern of changes in emissions tends to follow GDP, with generally small increases for most regions, although in some cases small reductions such as for South-East Asia under the ITA I NTB scenario.<sup>16</sup>

*“The impact of reducing NTBs for ICT goods covered under ITA I and II holds potential.”*

<sup>14</sup> This number was selected to follow the conservative hypothetical reduction in NTBs.

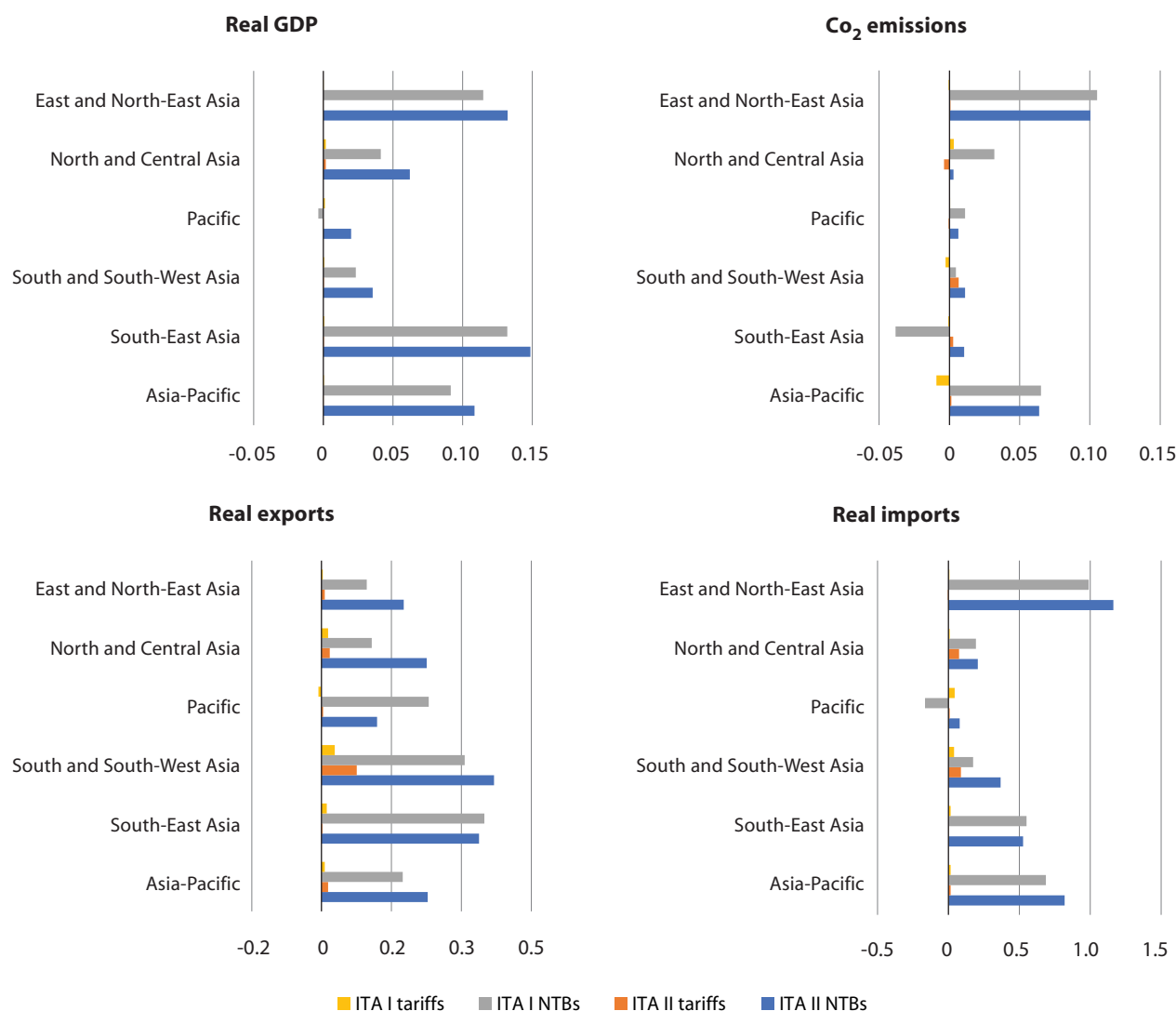
<sup>15</sup> Estimates updated in 2023 to reflect most recent trade cost estimates (<https://www.unescap.org/resources/escap-world-bank-trade-cost-database>) and digital trade facilitation implementation (<https://www.untsurvey.org/>).

<sup>16</sup> Driven by minor contraction in the petroleum and chemicals sector for countries such as Malaysia and Viet Nam, accompanying expansion of other sectors, such as computer equipment for Viet Nam. Further discussion is provided in Strutt and others (forthcoming). Sustainability impact of ICT goods trade and digital trade-related policies. ARTNeT Working Paper Series.



**Impact of ICT goods-related trade policies, by subregion (scenarios 1-4)**

(Annual percentage change)



Source: Authors' modelling results.

*“Digital trade policies have sizable impacts on GDP and exports while having a relatively limited impact on CO<sub>2</sub> emissions. Full implementation of digital cross border trade facilitation increases regional GDP by 1%.”*

In the simulations, the effect of “digital trade policies” is shown to be substantially larger than those of traditional barriers to trade. The effect of recent increases in protectionist digital policies (as captured by OECD DSTRI) reduces annual GDP by 0.4% in the

region, with a 1% reduction in the North and Central Asia subregion. The impact on trade is more severe, with exports reducing by more than 2% in the region, and more than 3% in the North and Central Asia subregion and South and South-West Asia subregion. However, even a partial reduction in digital trade restrictive policies has a positive impact on GDP and trade growth in the region, as shown in figure 6.3. Regional variation in the CO<sub>2</sub> emissions impact is largely determined by output changes in the petroleum and chemical sectors.



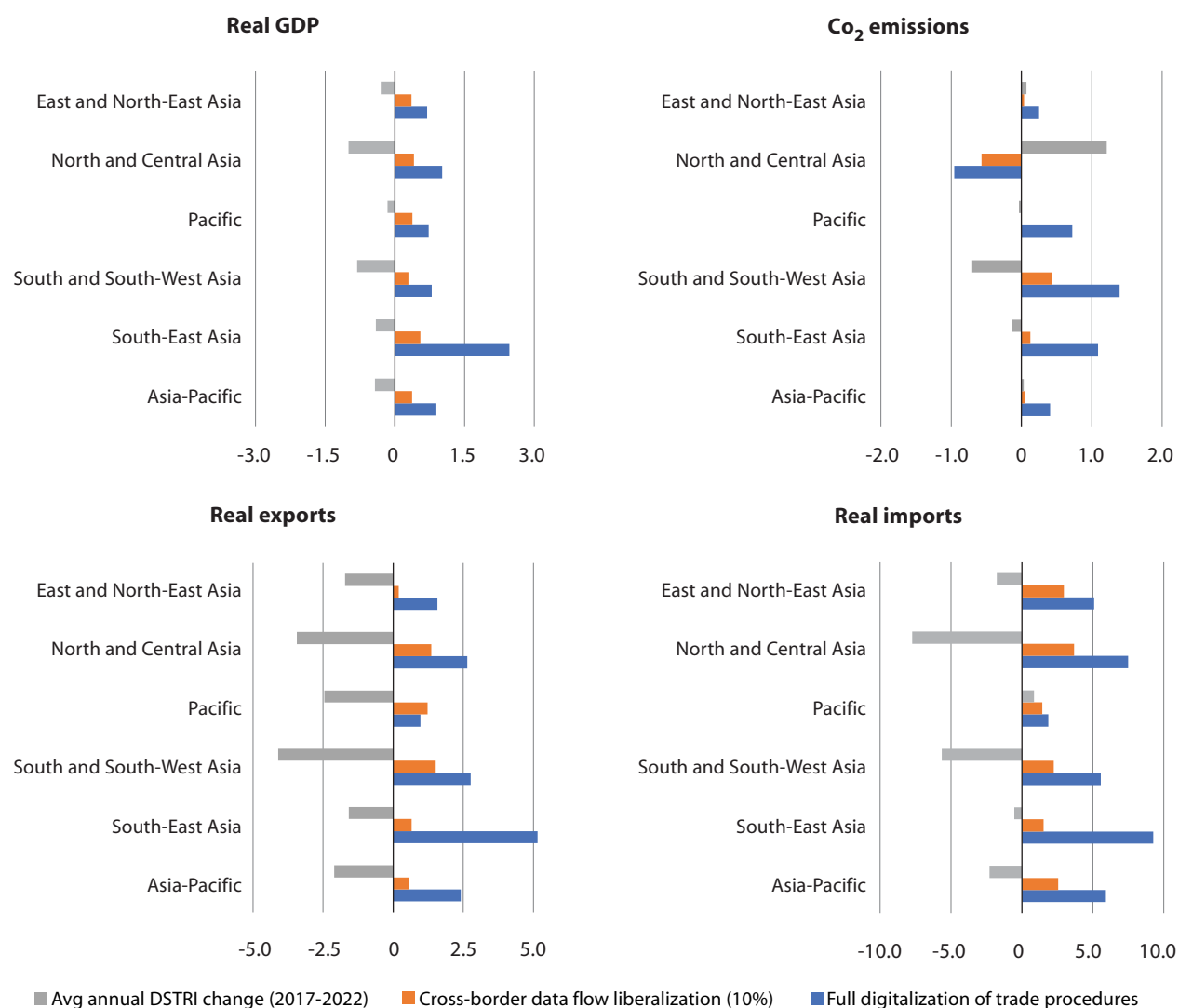
The most substantial positive impact, reaching an increase of almost 1% of regional GDP, comes from the full implementation of digital cross-border trade facilitation, as envisaged by the Framework Agreement on Facilitation of Cross-border Paperless Trade in Asia and the Pacific (CPTA).<sup>17</sup> The benefits

are shared by every subregion, with South-East Asia reaping the most benefits in relative terms. Overall, Asia-Pacific emissions increase by 0.4% in this scenario; however, they may be offset by a reduction in the necessity of physical documentation (Duval and Hardy, 2021).



**Impact of digital trade policies, by subregion (scenarios 5-7)**

*(Annual percentage change)*



Source: Authors' modelling results.

<sup>17</sup> See <https://www.unescap.org/projects/cpta>

## 8. SECTORAL IMPACTS

*“ITA-related goods trade policies come at a cost, albeit small, to the manufacturing sector, but to the greater benefit of the services sector.”*

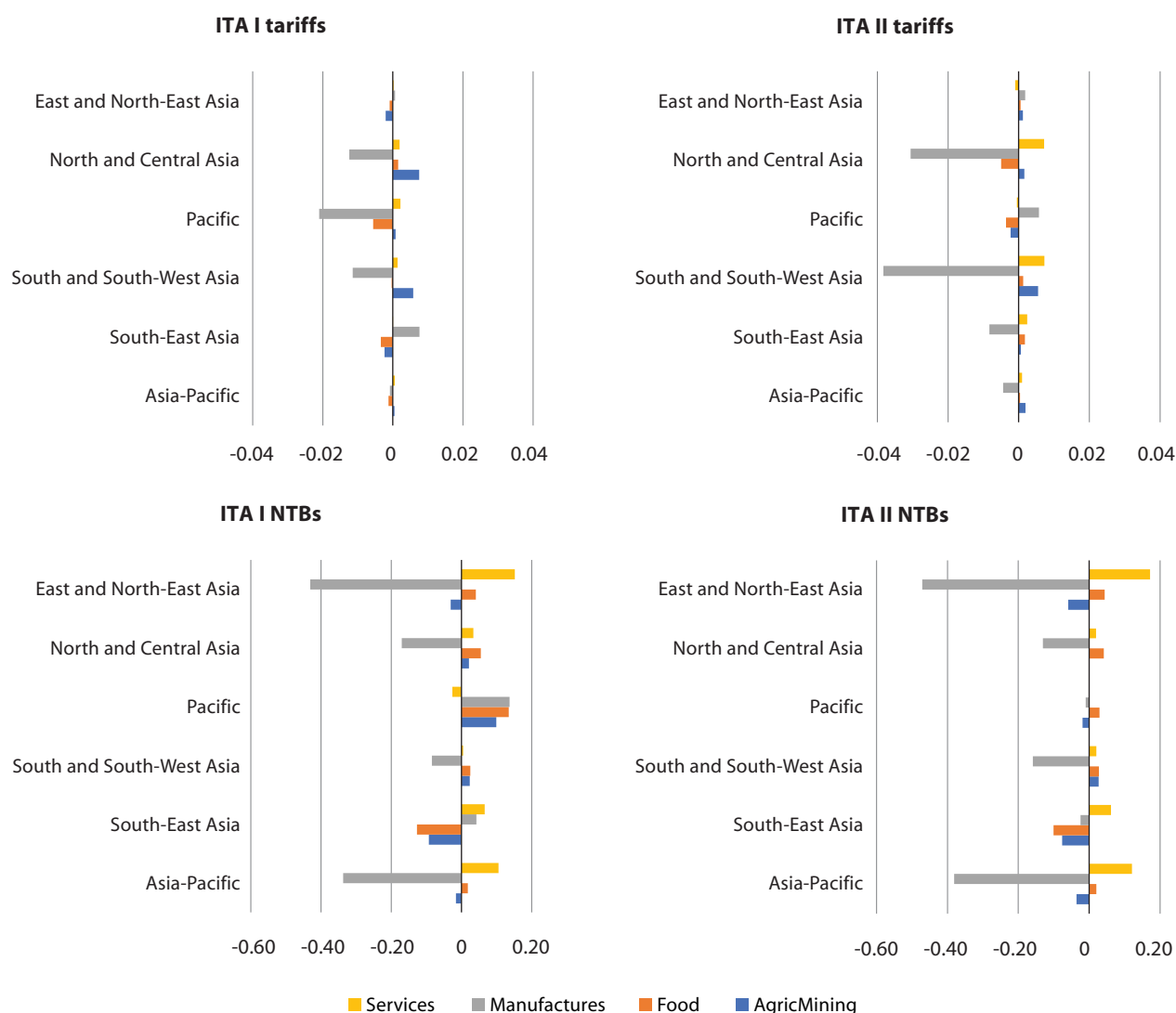
With regard to sectoral output impacts, changes in ITA-related goods trade policies tend to lead to small contractions for the aggregate manufacturing sector, but with an overall expansion for services. As with GDP and trade impacts, the results are significantly

more pronounced for policies targeting NTBs, with one-third of a per cent decline in the volume of output for the manufacturing sector in the region, accompanied by a more than 0.11% expansion in the services sector. There is heterogeneity among the subregions, for example with the South-East Asia subregion having small gains in the manufacturing sectors with ITA I tariff reductions and the Pacific with ITA II tariff reductions as well as with ITA I NTB reductions (figure 6.4). This is due to differences in the initial distortions and patterns of trade and production in the subregions.



**Sectoral output impacts of ICT goods-related trade policies, by subregion (scenarios 1-4)**

(Annual percentage change)



Source: Authors' modelling results.

*“Positive digital trade policies outweigh ICT goods-related policies – the net effect is positive but varies across sectors.”*

The sectoral results from “ICT goods-related trade policies” are dwarfed by the impacts of digital trade policies. In particular, the increased digital trade restrictions modelled lead to a contraction in the services sector to the benefit of agriculture and, to a lesser extent, manufacturing for the Asia-Pacific region (figure 6.5). Reductions in digital restrictions, on the other hand, have a negative impact on the

manufacturing and agricultural sectors to the benefit of the services sector. The shifts in skilled and unskilled labour largely follow the sectoral output patterns (see annex tables 1 and 2), although changes in services sector employment tend to be greater for unskilled than for skilled labour (see annex table 2).

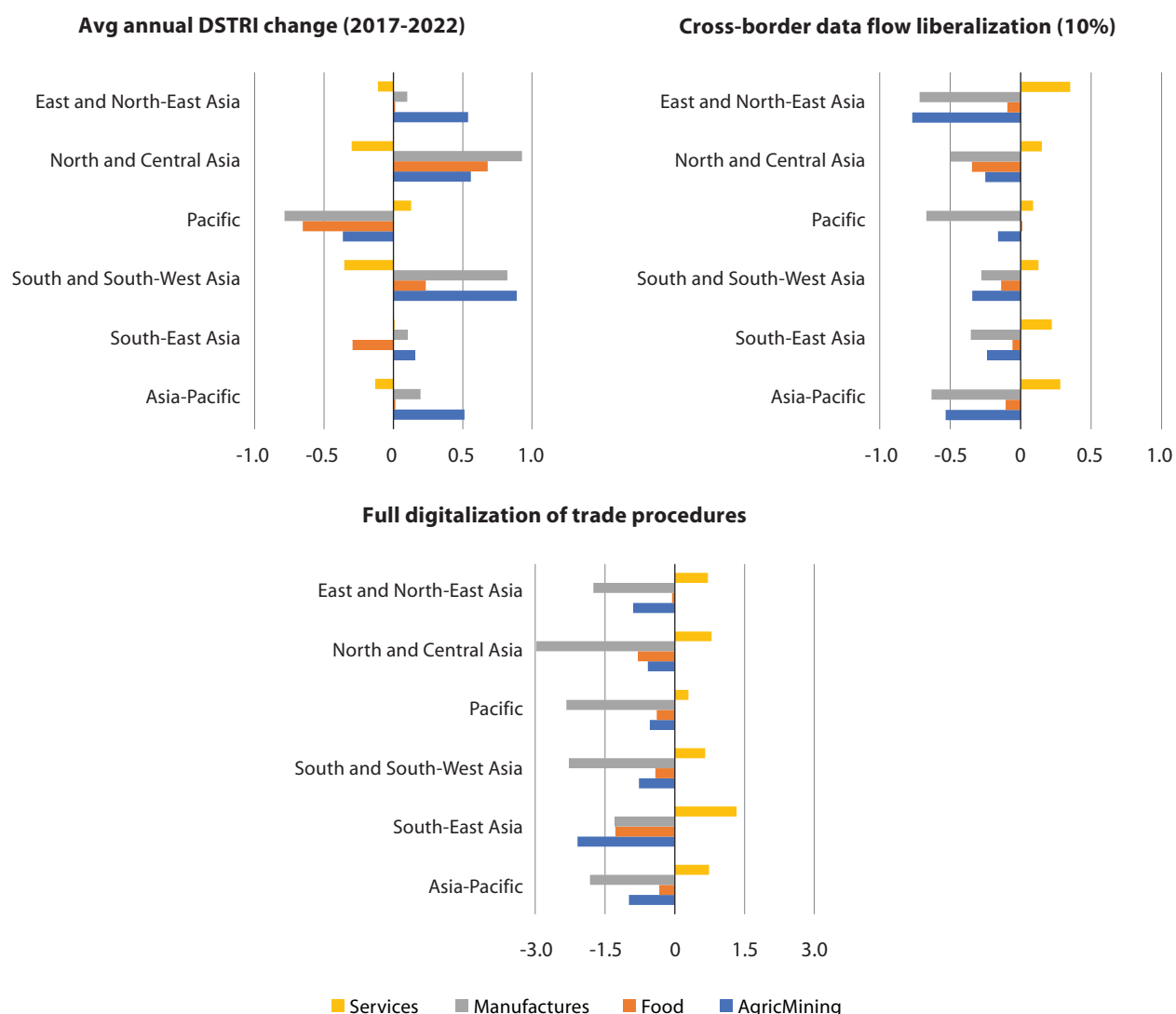
At the subregional level, export volumes contract for all sectors when digital trade restrictions increase, while they expand for all sectors when digital trade restrictions reduce. In the final scenario, where trade costs are eliminated for imports into the Asia-Pacific



**Figure 6.5**

### Sectoral output impacts of digital trade policies, by subregion (scenarios 5-7)

(Annual percentage change)



Source: Authors' modelling results.

region, exports of all good sectors expand while services exports contract, reflecting the fact that there is no reduction to barriers for services sectors in this scenario.

Differences in sectoral production outcomes are due to a range of factors, including sectoral differences in distortions that are increased or reduced as well as patterns of trade and production in the underlying data. Without increases in factor endowments or technology, accommodating sectoral expansions in a general equilibrium framework typically requires resources being drawn from other sectors. It should be kept in mind, however, that the net effect for economies overall, as described in the previous section, is positive. However, policymakers may consider putting into place supporting policies to help with the smooth transition of negatively-affected sectors and workers.

## 9. CONCLUSION

This chapter sought to analyse the impacts of trade liberalization of ICT goods, both tariff and non-tariff,

as well as a selection of digital trade policies for which empirical data has been available. In terms of traditional trade policies, results suggest there is relatively little scope to boost trade from tariff liberalization, but many gains remain untapped in addressing non-tariff barriers. In terms of digital trade policies, the overall growth in digital trade restrictiveness over the past five years is modelled to have slowed both trade and GDP growth. Reversal of such policies, even if partial, is modelled to offer significant benefits, orders of magnitude higher than that of traditional trade policies. Digitalization of cross-border paperless trade procedures, in particular, offers the most benefits in the simulations modelled in this report. With regards to sectoral impacts, sectoral output expansion – particularly by the services sector – may lead to some contraction of other sectors. However, these trade-offs should be considered in tandem with the overall growth in GDP and trade, which may help to offset negative short-run resource reallocation. In addition, policymakers may consider putting in place support policies to address these types of short-run reallocation dynamics.

## ANNEX

Annex table 1. Changes in skilled labour by aggregate region and sector (%)

	Asia-Pacific	Pacific	SEA	ENE	SSWA	NCA
<b>ITA I tariffs</b>						
AgricMining	0.00	0.00	0.00	0.00	0.00	0.01
Food	0.00	0.00	0.00	0.00	-0.01	0.00
Manufactures	0.00	-0.03	0.00	0.00	-0.01	-0.02
Services	0.00	0.00	0.00	0.00	0.00	0.00
<b>ITA II tariffs</b>						
AgricMining	0.00	0.00	0.00	0.00	0.00	0.00
Food	0.00	0.00	0.00	0.00	0.00	-0.01
Manufactures	0.00	0.01	-0.01	0.00	-0.04	-0.06
Services	0.00	0.00	0.00	0.00	0.00	0.01
<b>ITA I NTMs</b>						
AgricMining	-0.01	0.13	-0.15	-0.07	0.02	0.03
Food	-0.04	0.15	-0.14	-0.07	0.02	0.05
Manufactures	-0.32	0.16	-0.10	-0.41	-0.04	-0.33
Services	0.04	-0.02	0.03	0.07	0.00	0.03
<b>ITA II NTBs</b>						
AgricMining	-0.06	-0.02	-0.09	-0.12	0.02	0.03
Food	-0.06	0.02	-0.13	-0.08	0.02	0.06
Manufactures	-0.36	-0.07	-0.16	-0.44	-0.10	-0.31
Services	0.05	0.00	0.04	0.07	0.00	0.03
<b>Average annual DSTRI change (2017-2022)</b>						
AgricMining	0.45	-0.47	0.12	0.83	1.39	0.91
Food	0.03	-0.68	-0.20	0.13	0.45	0.63
Manufactures	0.24	-0.83	0.43	0.11	1.36	1.42
Services	-0.04	0.09	-0.08	-0.03	-0.08	-0.16
<b>Cross-border data flow liberalization (10%)</b>						
AgricMining	-0.72	-0.19	-0.39	-1.18	-0.45	-0.43
Food	-0.32	-0.04	-0.37	-0.39	-0.18	-0.37
Manufactures	-0.75	-0.83	-0.52	-0.81	-0.34	-0.80
Services	0.12	0.06	0.13	0.15	0.02	0.09
<b>Full digitalization of trade procedures</b>						
AgricMining	-1.29	-0.62	-2.93	-1.41	-1.67	-0.98
Food	-0.79	-0.30	-1.96	-0.55	-0.75	-1.34
Manufactures	-2.37	-2.75	-3.66	-1.95	-2.88	-4.35
Services	0.35	0.20	0.86	0.34	0.16	0.42

**Annex table 2. Changes in unskilled labour by aggregate region and sector (%)**

	Asia-Pacific	Pacific	SEA	ENE	SSWA	NCA
<b>ITA I tariffs</b>						
AgricMining	<b>0.00</b>	0.00	0.00	0.00	0.01	0.01
Food	<b>0.00</b>	0.00	0.00	0.00	0.00	0.00
Manufactures	<b>0.00</b>	-0.03	0.00	0.00	-0.01	-0.03
Services	<b>0.00</b>	0.00	0.00	0.00	0.00	0.00
<b>ITA II tariffs</b>						
AgricMining	<b>0.00</b>	0.00	0.00	0.00	0.01	0.00
Food	<b>0.00</b>	0.00	0.00	0.00	0.00	-0.01
Manufactures	<b>-0.01</b>	0.01	-0.01	0.00	-0.06	-0.06
Services	<b>0.00</b>	0.00	0.00	0.00	0.01	0.01
<b>ITA I NTMs</b>						
AgricMining	<b>-0.02</b>	0.12	-0.13	-0.04	0.04	0.03
Food	<b>0.03</b>	0.14	-0.08	0.04	0.03	0.07
Manufactures	<b>-0.42</b>	0.15	-0.22	-0.50	-0.09	-0.32
Services	<b>0.14</b>	-0.03	0.10	0.18	0.01	0.06
<b>ITA II NTBs</b>						
AgricMining	<b>-0.04</b>	-0.02	-0.10	-0.09	0.04	0.00
Food	<b>0.03</b>	0.02	-0.07	0.04	0.03	0.06
Manufactures	<b>-0.46</b>	-0.07	-0.22	-0.53	-0.19	-0.34
Services	<b>0.15</b>	0.01	0.10	0.20	0.03	0.07
<b>Average annual DSTRI change (2017-2022)</b>						
AgricMining	<b>0.77</b>	-0.46	0.15	0.80	1.02	0.74
Food	<b>-0.01</b>	-0.64	-0.39	0.01	0.09	0.82
Manufactures	<b>0.15</b>	-0.80	-0.27	0.13	0.31	1.47
Services	<b>-0.19</b>	0.13	0.05	-0.15	-0.52	-0.45
<b>Cross-border data flow liberalization (10%)</b>						
AgricMining	<b>-0.76</b>	-0.19	-0.36	-1.11	-0.46	-0.33
Food	<b>-0.10</b>	-0.03	-0.06	-0.09	-0.11	-0.36
Manufactures	<b>-0.68</b>	-0.80	-0.49	-0.78	-0.10	-0.73
Services	<b>0.36</b>	0.09	0.25	0.43	0.23	0.22
<b>Full digitalization of trade procedures</b>						
AgricMining	<b>-1.32</b>	-0.60	-2.68	-1.30	-0.90	-0.74
Food	<b>-0.15</b>	-0.23	-0.74	-0.03	-0.05	-0.99
Manufactures	<b>-2.01</b>	-2.67	-3.15	-1.85	-1.77	-4.54
Services	<b>0.89</b>	0.31	1.76	0.83	0.82	1.10



**Annex table 3. Sectors modelled**

No.	Sectors modelled	Original GTAP sectors*	Sector description
1.	AgricMining	pdr wht gro v_f osd c_b pfb ocr ctl oap rmk wol frs fsh coa oxt	Agriculture and mining
2.	Food	cmt omt vol mil pcr sgr ofd b_t	Food
3.	Textiles	tex wap lea	Textiles
4.	WoodPaper	lum ppp	Wood and paper
5.	PetrolChem	oil gas p_c chm bph rpp nmm	Petroleum and chemicals
6.	BasicMetals	i_s nfm fmp	Basic metals
7.	ComputerEqui	ele eeq	Computer equipment
8.	MachinTransp	ome mvh otn omf	Machinery and transport equ
9.	WholesRetail	trd	Wholesale and retail
10.	TransportSvs	otp wtp atp whs	Transport services
11.	Telecom_Info	cmn	Telecoms + information sv
12.	OthBusSvs	ofi ins rsa	Other business services
13.	OtherSvs	ely gdt wtr cns afs obs ros osg edu hht dwe	Other services + remaining

\* See <https://www.gtap.agecon.purdue.edu/databases/contribute/detailedsector.asp#Sector65> for full details of the 65 GTAP sectors.

\*\* For reporting purposes, Textiles, Wood and paper, Petroleum and chemicals, Basic metals, Computer equipment, Machinery and transport are aggregated into a single Manufactures sector and all services sectors are combined into a single Services sector.

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## CHAPTER



# Attracting digital FDI to cultivate a sustainable and inclusive economy

Investment in the digital economy can both drive economic advancement and support a paradigm shift towards sustainable investment. Investments from firms using digital technologies in additive manufacturing can dramatically minimize resource use, wastage and pollution, by relying on stronger, more efficient synthetic materials and boosting precision in production. Artificial intelligence, digital connectivity and analytics could significantly boost agricultural yields and end hunger. Big Data and 3D virtual reality can help breakthrough innovations in medicine, which combined with telemedicine could revolutionize health outreach, even to the world's poorest and most remote communities. Despite this recognition, many countries, especially in Asia and the Pacific, continue to struggle in terms of how they can practically and realistically attract and leverage such investment.

This chapter therefore discusses and provides recommendations for how countries can proactively attract foreign direct investment directly in digital economy sectors, like IT and IT services, digital platforms etc., but also in sectors that are not traditionally digital but have the room to become digitally enabled. This chapter is particularly relevant for investment promotion agencies looking to target FDI in traditional digital economy sectors as well as sectors that can become digitally enabled.

## 1. IMPLICATIONS OF DIGITAL FDI: BENEFITS FOR HOST COUNTRY, TYPES OF INVESTORS AND INVESTMENTS

Foreign direct investors in the digital economy can help to host economies cultivate their digital environments. FDI in digital infrastructure can help to develop digital infrastructure in the host economy. FDI that contributes to digital adoption by local businesses and the digitalization of the wider economy can lead to innovations in the production and distribution systems of traditional companies and the upskilling of employees. FDI from digital businesses can lead to the transfer of skills and technology as well as a flourishing digital start-up environment. However, for FDI in any of these three areas in the digital economy to materialize, policymakers must create a favourable business, investment and governance environment for FDI, and

IPAs must undertake appropriate actions to attract, promote and facilitate entry of FDI into their digital economies.

*“Depending on policy environment, the impact of FDI can be overwhelmingly positive or disastrous – a pro-active approach by IPAs to advocate for conducive policies and attract quality FDI is imperative.”*

The following chapter is divided into two parts. The first part provides a broader discussion of the types and examples of digital FDI in Asia and the Pacific and the larger benefits that they can bring to host economies. This discussion serves as a backdrop for the second part of the chapter which focuses on the policies that policymakers in both ICT and Commerce Ministries can undertake as well as the actions that IPAs can undertake to proactively attract and facilitate FDI in the digital economy. Both parts of the chapter are inherently related: (1) understanding the different types of FDI, the actual types of firms that make the investments; and (2) the examples of investments are critical to developing the right policies and appropriate investment promotion measures and actions to attract and facilitate such investment. Targeting investors requires that IPAs, and even Governments, know the language and local value proposition that is going to bring in those investors. Identifying the investors requires that IPAs understand the universe of investors that are out there in each of these areas. One cannot go without the other, hence the discussion has been merged into two parts in this chapter.

### 1.1 FDI in digital infrastructure

Digital infrastructure FDI can take the form of greenfield or brownfield investments, and mergers and acquisitions (M&As). Greenfield FDI involves the creation of new digital connectivity networks and services in a host economy. An example is Telenor's creation of a part of Myanmar's digital telecommunications network. Brownfield investments expand an existing operation or take a share in one. Examples include Vodafone's expansion in India and the Singtel Group's acquisition of Axiacom, as well as Axiata's (Malaysia) investments in mobile and fibre optics networks in Sri Lanka.<sup>1</sup> These

<sup>1</sup> For example, in 2022, Axiata invested US\$ 152 million in expanding these networks. For additional details see <https://economynext.com/sri-lankas-dialog-axiata-to-invest-us152-4mn-in-mobile-fibre-100046/>

investments help to boost digital connectivity in host countries and are important enable to sustainable development. For example, and among other things, expanded digital connectivity can help to increase access to digital financial services as well as access to digital tools that can help increase resiliency among populations to natural disasters.

Competition for FDI into digital infrastructure can be particularly fierce, however, especially for data processing centres. Therefore, countries looking to promote this type of FDI need to develop a coherent strategy targeting the right type of digital infrastructure appropriate for their level of development.

Host economies can benefit from FDI in digital infrastructure in a variety of ways. First, FDI brings in the much-needed capital with which to create digital connectivity networks, assets and equipment in locations in which they did not exist earlier. By serving as an additional source of infrastructure financing, FDI can help host countries – especially those which are short of capital – obtain the vast sums of money needed to build costly digital connectivity networks. Since digital infrastructure FDI firms operate internationally, they enable host countries to connect more quickly into global digital connectivity networks than they might have been able to do on their own.

Second, FDI brings in the technology and expertise required to build and operate such networks. As these become increasingly complex, more advanced talent is required, which is often not locally available. Foreign direct investors not only bring in the necessary expertise from overseas, they also systematically develop it in their local operations. This not only nurtures technology transfer, it also encourages local innovation and entrepreneurship. In some cases, former employees of locally invested FDI firms spin off their own digital infrastructure business. In others, local firms spring up to compete with foreign digital infrastructure investors, creating more entrepreneurship, technological competition and technology innovation. Investors bring new types of technology and services to a market, benefiting customers.

These impacts are observed even in foreign acquisitions and take-overs, when FDI improves the performance of existing projects by introducing new styles of management and more modern technology.

Third, digital infrastructure creates a diverse spectrum of direct and indirect jobs ranging, for example, from planning, construction, maintenance and servicing, to transportation, training as well as food and other services for workers. More importantly, digital infrastructure enables the creation of entirely new types of digitally-based jobs – and dramatically enhances productivity. The global experience thus far shows that a 10% expansion in mobile broadband penetration raises GDP by 2.44% in developing Asia-Pacific countries (ITU, 2020) and by 2% in middle-income and low-income economies overall (ITU, 2019). Similarly, a 10% increase in fixed broadband penetration can raise GDP by 1.63% in developing Asia-Pacific, and by 0.5% in middle-income and low-income economies (ITU, 2019).

*“FDI can provide host economies with the much-needed capital, technology and expertise, and jobs to develop and sustain digital infrastructure.”*

Each major component of digital infrastructure has its own set of specialized firms and foreign direct investors (UNCTAD, 2017). Broadly, they fall into three categories, each briefly described below, to guide policymakers and IPAs when researching and identifying potential foreign direct investors in digital infrastructure:

- **Telecommunications networks and services firms:** These firms build and operate the physical equipment and systems that enable digital transmission, storage and processing (UNCTAD, 2017);
- **Mobile operators:** This category also includes telecommunications service providers (sometimes referred to as Communications Service Providers) that offer voice telephony and Internet services using wired (fixed line/fibre) or wireless (mobile) technologies;
- **Connectivity device and IT component firms:** These companies produce digital connectivity devices that transmit and receive data signals and their constituent IT components (UNCTAD, 2017);
- **Data storage firms:** These companies build and operate the physical equipment and systems that enable the storage and processing of digital data (UNCTAD, 2017). These firms are also commonly referred to as data colocation or data centre firms.



Traditionally, firms investing in digital infrastructure had operations that fell solely into one of the above categories. However, as digital transformation has accelerated over the past several years, the lines between categories have blurred. Bigger firms have tended to become more vertically integrated across the value chain. Collaborative partnerships (non-equity modes of FDI) have also grown between firms to enhance services and market share in overseas locations. For example, Huawei produces and sells a range of telecommunications equipment, mobile handsets, IoT devices and telecommunications software globally. Verizon, an Internet Service Provider, and Equinix, a data centre firm, are partnering to develop global automation solutions for their clients all over the world. Foreign direct investors in digital infrastructure are also tying up with businesses in other sectors to co-develop novel applications for overseas markets. For example, Korea Telecom (KT) is partnering with Vietnam Television to develop a Vietnamese music streaming platform, and Singtel has tied up with the Hyundai Motor Company to create IoT-enabled smart manufacturing and automotive solutions (GSMA, 2021).

In terms of data centres, several European countries including the Netherlands are now refusing to allow additional data centre investments into their countries due to their high demand for energy. This provides Asian and Pacific countries an opportunity to target such investments. However, in attracting these investments, countries must look to encourage investors to power these data centres through renewable sources of energy to ensure they do not detract from them achieving their net zero and renewable energy transition goals. This is indeed possible and feasible, and moreover, investors are willing to use renewables to power their data centres as long as countries can provide them with reliable and adequate access to such energy. For example, Amazon has opened a data centre in Indonesia that is powered largely by solar power. To ensure access to the solar energy the plants, it has entered into a power purchasing agreement with a State energy provider to procure the energy for the centre from four different solar sites. Several other countries in the region, including Bhutan and Kyrgyzstan, are also exploring the use of hydropower to attract data centre investors that are also looking to maximize their sustainable energy commitments to shareholders.

Table 7.1 presents some illustrative examples of the types of firms that operate within each of the three digital infrastructure categories, including digital infrastructure software providers. It also offers examples of the types of digital infrastructure FDI projects that have been undertaken in Asia and the Pacific.

*“IPAs and policy makers will have to integrate the priorities of investors into their operating and development strategies to foster successful digital infrastructure.”*

Foreign direct investors in digital infrastructure prioritize a number of factors when considering overseas investment locations. It is important for host countries to understand and address these factors to attract investments by investing firms and maximize their contribution to digital economy development. Among the top priorities are: (1) presence of a functioning modern licensing system; (2) availability of skilled engineers and local labour; (3) efficient spectrum allocation, independent sector and competition regulation; (4) the host country's use of global digital infrastructure standards; (5) collaboration with neighbours to develop regional connectivity; and (6) an open, liberal FDI regime. In addition, data centre investors prioritize stable, uninterrupted and cheap electricity. To attract digital infrastructure investors, policymakers and IPAs in host countries will need to put these essential elements in place.

## 1.2 FDI in digital adoption

Foreign direct investment can be used to help local firms digitalize their operations in four ways, each of which is outlined below. Investment policymakers and IPAs need to understand these four drivers of corporate digitalization. This is necessary so that when they undertake investment climate reforms and investment promotion activities, they can attract and target the right kind of FDI firms to support local businesses (including the local subsidiaries of foreign firms invested in the country), in order to integrate these technologies into their operations. Each of these four areas of corporate digital adoption also create new international markets for digital technology, expanding overseas investment opportunities for foreign direct investors in the digital economy.

**Examples of foreign direct investors in digital infrastructure**

Telecommunications networks/services	Data storage/processing	Connectivity devices and IT components	Digital infrastructure software
<b>Ericsson</b> (Sweden)	<b>Equinix</b> (United States of America)	<b>Lenovo</b> (China)	<b>Cisco</b> (United States of America)
Opened a regional network operations centre in Singapore, which provides hosting services for mobile applications and content management to operators and service providers in Asia (2005).	Opened a data centre in Tokyo (2021).	Invested US\$ 59.10 million in a smartphone manufacturing facility in Serang with capacity to produce 75,000-150,000 devices monthly (2015).	Invested US\$20 million in a new Webex data centre in Sydney, Australia, to serve clients in the country (2019).
<b>Huawei Technologies</b> (China)	<b>Digital Realty</b> (United States of America)	<b>Oppo</b> (China)	<b>Apple</b> (United States of America)
Launched a 4G network in the Nakhchivan Autonomous Republic, Azerbaijan, which serves residents of remote villages in the region (2016).	Created a data centre in Gimpo City, the Republic of Korea, which serves the domestic market (2021).	Invested US\$ 30 million in an assembly plant in Tangerang, Indonesia with a production capacity of 500,000 smartphones (2015).	Invested US\$3.9 million in opening a developer academy in Jakarta to train local students in developing apps for the IOS system. Apple plans to open two more academies by 2019 in Indonesia (2018).

Source: ESCAP, based on fDi Markets (2023) (<https://www.fdimarkets.com/>).

**(1) Cloud technologies:** Cloud computing technology enables the sharing of resources within MNE networks and facilitates new forms of pooling arrangements. Cloud technologies give companies online access, as needed, to the software applications, computing ability and data storage they require, for a small fee, saving them from having to make expensive hardware and software investments in-house. Access to services can significantly lower capital and operating expenses for companies operating online, and can provide access to a number of online services important to businesses, ranging from e-mail and web hosting to customer relationship management software (UNCTAD, 2021). Adopting cloud technologies can make FDI from traditional firms' asset-light as it enables a firm to avoid buying expensive servers and software packages, and to hire dedicated IT staff to operate systems and upgrade software.

**(2) Industry 4.0 technologies:** Manufacturing firms are adopting and investing overseas in Industry 4.0 (or 'smart manufacturing') digital technologies that enable them to remotely automate, control and optimize and observe production and supply chain operations in real time (box 7.1).<sup>2</sup> Industry 4.0 technologies combine robotics IoT and AI to render production equipment and processes 'intelligent' via embedded actuators and sensors, digitally connected to computing and control devices. These actuators and sensors continually transmit data about the production process, product quality and the health of production equipment (and components) to an 'intelligent' control centre, which automatically relays instructions back to enhance performance. In addition to improving productivity, they can also help to reduce waste and contribute to the environmental sustainability of both the product and production processes which, in turn, can directly contribute to SDG 9 targets on innovation and industry.

<sup>2</sup> See <https://classic.qz.com/perfect-company-2/1145012/a-german-company-built-a-speedfactory-to-produce-sneakers-in-the-most-icent-way/>.



### **Harnessing Industry 4.0 technology in value-chain linked FDI: Greenfield FDI in the textile sector**

In Adidas' digitally connected Speed factories in China, Indonesia, the United States and Viet Nam robots work alongside humans to manufacture sneakers, speeding production from more than two months to a couple of days. These Speed factories are examples of greenfield FDI investments in each of those countries. In these factories, international digital connectivity and 3D printing enables Adidas to engage internationally with customers and to quickly create digital mock-ups and physical prototypes for new sneaker models. Adidas then uses Industry 4.0 technology to simulate every aspect of production down to each individual machine, and to optimize factory layout and production flow to ensure product quality and to minimize costs.

Since each component of production is tagged with a scannable QR code, problems with product quality can be traced back to individual parts, and resolved. Adidas' Speed factories can be automated to mass produce sneakers and restock shops in Europe and the United States within days, rather than months.

Customer engagement also enables Adidas to produce only what it will sell – and thus, significantly reduce inventory and sunk costs. The Adidas goal is to make shoes tailored to the size and shape of individual customers' feet by further enhancing digitalization. Nike, its global competitor, is harnessing similar technologies for similar ends. This flexibility, however, also results in less stable output levels. These manufacturing production technologies, enabled by digitalization, affect the optimum scale of production and, hence, investment requirements and location decisions.

*Source:* ESCAP, adapted from Bain (n.d.). Adidas, A German company built a “Speed factory” to produce sneakers in the most efficient way (<https://classic.qz.com/perfect-company-2/1145012/a-german-company-built-a-speedfactory-to-produce-sneakers-in-the-most-efficient-way/>).

Other industry 4.0 technologies, such as specialized virtual reality technologies, simultaneously enable shop floor managers to remotely observe in 3D (or simulate) micro-steps in the manufacturing process, including the wear-and-tear on components with specialized equipment. This, in turn, enables predictive maintenance of parts and equipment, requiring less re-investment in machinery and equipment by the investor (UNCTAD, 2019; UNIDO, 2020). Lead firms in global and regional supply chains might be interested in investing in this equipment to increase manufacturing efficiency and reduce any future re-investment (FDI) costs in equipment.

From a host country perspective, automation in internal production processes drives higher capital intensity and creates high-skilled, high-value jobs. In addition, Industry 4.0 technologies that enhance replication and scale flexibility also drive more distributed manufacturing models with significant local value-added in host countries and sophisticated centralized coordination (UNCTAD, 2021). From a foreign direct investor's perspective, Industry 4.0 technologies enable these types of investments to take place in more widespread, small-scale production units, rather than a few large locations,

with quality control managed from sophisticated, centralized headquarters. For this reason, Industry 4.0 could create novel avenues for integrating a larger number of local firms into global and regional supply chains. This change of the geographic footprint – from one large node to many smaller nodes – does not imply a reduction in overall job creation. In fact, jobs will be more evenly dispersed geographically, thanks to Industry 4.0 providing investors with the means to invest in new territories and regions – removing traditional obstacles. As a result, spillovers will emerge from several locations, not just a large centre, and spread the effects of FDI more evenly throughout the territory (i.e., job creation, upskilling, wage assimilation, etc.).

Similarly, technology such as 3D printing will enable firms to ‘print’ three-dimensional products from a digital design, so firms would no longer need to be close to raw materials or invest in elaborate supply chains for manufacturing. The competitive advantage of countries with cheap raw materials might decrease with the introduction of 3D printing in manufacturing. However, digitalization and remote control might give some firms the confidence to further diversify and geographically expand their value chains to make

them more resilient. Many firms might create international networks of centrally controlled ‘3D print shops’ close to end-consumers, and could print and sell products as needed at no extra marginal cost. In Sri Lanka for example, a new industry is emerging around digital product development for the apparel industry. This is enabling Sri Lanka to move up the value chain from being just a traditional apparel manufacturer to a front end developer of apparel. This transition has occurred in the past five years when a number of firms stopped producing physical product samples and doing physical showroom displays for their buyers, and instead started deploying technology to enter into product development. This has involved creating 3D design and fit samples for each garment they produce, creating and utilizing digital avatar showrooms for buyers, and using AI tools and predictive technologies for forecasting to help buyers undertake merchandise planning. FDI, through joint ventures and wholly-owned subsidiaries, has played a key role in developing this high value-added segment of the apparel industry in Sri Lanka. Market leading firms including, MAS Active Nirmana, Star Garments (a Komar company), and Brandix Inquible.

**(3) Big Data and analytics:** Big Data analytics allows the simultaneous processing of huge streams of variegated information and enables sending out automated commands in real-time. Firms that have adopted data and analytics technology see the greatest overall growth in revenue and earnings,

pushing competitors and other industry players to strategically do the same (McKinsey, 2019). So, across sectors, foreign and local firms are investing in Big Data and data analytics to outdo rivals. Both foreign and local firms are also investing in creating and selling Big Data and data analytics technologies to a range of consumers in host markets, including individuals, Governments, non-governmental organizations and other businesses.

Big Data and analytics have the potential to change and optimize value chain linked FDI (box 7.2), and many Asian and Pacific countries have firms that are highly integrated into these value chains. It is important that policymakers and IPAs understand what these changes are and how they may have an impact on the value-chain linked FDI that their countries’ firms receive. Big Data and analytics enable companies to have complete information on where and when they should invest overseas, while also encouraging them to form data-related partnerships along the value chain (box 7.2).

Across the end-to-end supply chain, continuous reconfiguration of optimum site locations and sourcing options is being supported by more dynamic network design tools and improved forecasting driven by market data. Therefore, data across the supply chain will become increasingly valuable, with data ownership and free flow of data gaining importance as investment determinants. The free flow of data is intrinsically tied to the operability



### Generating sustainable FDI from Big Data analytics

Unilever, a consumer goods firm and one of the world’s largest foreign direct investors, is using Big Data and AI in its foreign direct investments in Indonesia and Brazil to ensure that its palm oil purchases are environmentally sustainable. It is collaborating with Orbital Insights, a geospatial analytics business, to map palm crop movements from originating farms and mills to the factories that have been built overseas through Greenfield FDI.

Using tens of thousands of satellite images of local deforestation, geo-location data from the trucks carrying palm oil from source farms to its factories, and Artificial Intelligence algorithms, Unilever now has a real-time snapshot of which trucks originate in deforested areas, so that it can stop sourcing from such places and can invest in reforestation. Since this technology is now being applied to other products in other parts of the world, Big Data and AI can also help foreign direct investment become more sustainable.

*Source:* ESCAP, adapted from Unilever, 2020 – How we are using technology to help end deforestation (<https://www.unilever.com/news/news-search/2020/how-were-using-technology-to-help-end-deforestation>).

of businesses in the digital realm. Big data operations' success as well as that of digital platforms mentioned in the section below, depends on the size and flexibility of the data at hand – cross-border data flows are thus a major investment location determinant as they directly impact business operations and prospects.

**(4) Mixed digital platforms, apps and digital subsidiaries:** A growing number of traditional firms, globally, are creating their own digital platforms and mobile applications to compete with rapidly-expanding digital businesses invading their sectors, and to better serve consumers going online.

Many traditional firms are also setting up 'digital subsidiaries' in host countries to bring in additional income through the provision of online services, post-sale maintenance and business/strategy consulting services to customers (Frederick and others, 2018). Some of these digital subsidiaries are so profitable that their parents have grown them into fully-fledged and complementary global businesses. For example, Siemens now has a digital software subsidiary – Siemens Digital Factory – which sells software to analyse immense reams of development, supply chain and production data in real time. In 2019 and 2020, Siemens' Digital Factory generated an annual average revenue of Euro 15.5 billion, larger than the revenue generated individually by its core infrastructure, medical engineering and mobility businesses.<sup>3</sup> It is likely that a growing number of foreign direct investors may consider developing similar subsidiaries in developing host economies that have a labour force with the relevant digital skills.

Digital platforms and apps in the upstream value chain can also alter supplier interactions through e-auctions. They can help bring in new suppliers and have a democratizing effect, allowing new entrants to participate in cross-border supply chains. However, if purchasing platforms are complex or require qualifying capabilities that are challenging to meet, digitalization can also drive exclusivity and favour established partners.

Similarly, downstream digitalization offers opportunities for accessing new channels that lead directly to the end-customer. Through adopting

e-commerce platforms and digital apps, foreign direct investors can directly supply consumers, getting rid of any intermediaries in the process. E-commerce platforms may also create new services partnerships. This might lead to more FDI in the services sector, in such activities as advertising, media and financial services, if host Governments permit it.

*“FDI in cloud and Industry 4.0 technologies, big data and analytics and mixed digital platforms help local firms digitalize their operations, fostering resilience and new business opportunities.”*

Table 7.2 presents a list of traditional firms that have recently undertaken FDI activities that support digital adoption in their overseas operations or by host country businesses. In deciding which firms to target, IPAs should undertake a comprehensive feasibility study that (1) identifies national development needs and priority sectors in the digital economy, (2) the level of digital infrastructure and digital competitiveness in their economy, (3) the extent of digital adoption by local businesses, and (4) where target investors could make the largest potential contribution to furthering digital adoption and wider digitalization in the economy.

*“Policy makers and IPAs must ensure the prevalence of high-quality digital connectivity, digital skills, a technology and start-up ecosystem, and a robust regulatory framework to attract FDI for digital adoption.”*

In conclusion, in order for a country to attract FDI that will support digital adoption, policymakers must address several issues. These factors include:

- **High quality international and national digital connectivity and computing:** This is an essential prerequisite for firms running globally connected operations in which the headquarters have real-time insight into all subsidiaries and field offices. It is also important for firms relying on data-intensive applications, which are now fundamental to growing and maintaining global competitiveness;

<sup>3</sup> See <https://www.statista.com/statistics/281333/revenue-of-siemens-ag-by-segment/>.



**Examples of MNEs with investment in digital adoption**

Firm name	Sector, home economy	Investment
<b>Amdocs</b>	Software and IT Services, United States	Amdocs, a provider of software and services, has opened an office in Bangkok, Thailand. The company will look to leverage its expertise in 5G adoption in the domestic market (2022).
<b>BHP Group</b>	Mining, Australia	BHP, a multinational mining and petroleum company, opened a new mobile applications hub in Shanghai, China, to develop applications for mobile devices to help improve communications and productivity across the company (2016).
<b>BMW</b>	Automotive, Germany	BMW entered into a joint venture with China-based Tencent to open a computing centre in Tianjin, China, for the development of self-driving cars (2019).
<b>Adidas</b>	Textiles, Germany	Adidas has opened a new tech hub office in Gurugram, India. It will hire tech and engineering talents to work on Adidas products and initiatives. The tech hub office will be the home to a local marketing organisation and one of the global engineering tech hubs. The goal of the investment is to have the tech hub office act as the digital sports company arm of the parent firm (2021).
<b>Airbus</b>	Aircrafts, Netherlands	Airbus opened a new information management facility in Bangalore, India, which will support the expansion of the company's information technology and digital capabilities across its global operations (2019).
<b>Axiata</b>	Telecommunications, Malaysia	Axiata has tied up with Tech Mahindra, an Indian software firm, to co-develop 5G enterprise solutions for businesses in five Asian countries.

Source: ESCAP, based on fDi Markets (2023) (<https://www.fdimarkets.com/>).

- **High quality digital skills:** Firms employing digital technology in overseas investments require local workforces that can operate and repair 'intelligent' machinery, deliver digitally enabled services, or use digital tools for other commercial purposes;
- **A tech and start-up ecosystem:** Investors looking at projects to support digital adoption may also vet local tech ecosystems when considering investment locations. This intensifying global digital competition is compelling traditional foreign direct investors to compete on complex "platform-based business models, multi-sided markets, network effects and economies of scale (OECD, 2019). Vibrant and competitive ecosystems thus offer synergy effects for innovation, and even opportunities for cooperation and linkages and are therefore an important location factor;
- **A robust regulatory framework for the digital economy:** The more traditional foreign direct investors use digital platforms, data-based innovations and digital operating models to compete, the more they will need – and must comply with – the regulatory frameworks created for the digital economy. They, too, will need laws that protect their data, intellectual property and contracts that enable and recognize digital IDs, digital payments and e-commerce. At the same time, they will also become responsible for protecting the privacy and security of customer data.

### 1.3 FDI from and in digital business

Digital businesses rely on the Internet to create, market and deliver virtual and physical products and services to customers all over the world. They include “purely digital players” that operate entirely in a digital environment and “digital mixed players” that combine a prominent digital dimension with a physical one (UNCTAD, 2021). Apple, Microsoft, Alibaba, Alphabet and Facebook are only some of the largest digital businesses today.<sup>4</sup> These companies have further inspired a burgeoning ecosystem of digital businesses all over the world, especially in Asia (UNCTAD, 2017).

Since digital businesses are becoming increasingly ubiquitous, it is important for investment policymakers and IPAs in prospective host countries to understand their distinctive features so as to create an FDI environment and strategy most suited to attract them. The following four features are unique to digital businesses and the types of FDI that they most commonly pursue:

1. Digital production and delivery;
2. Asset and employment lightness;
3. Use and creation of platforms and networks;
4. Flexibility to rapidly scale-up operations and operate cross-sectorally.

Digital businesses can be important sources of funds, technology and ideas to help create and develop local digital firms. When expanding to new markets, digital businesses need to orient their new digital activities and content towards the local market in order to be successful. This creates opportunities for collaboration between global digital firms and local SMEs and businesses, opening up opportunities for non-equity modes of FDI in host countries (Taylor Strauss and others, 2021).

A growing number of global digital firms have been investing in the development of local digital firms in developing countries (UNCTAD, 2021). For example, Facebook recently invested in the Indian telecom company Jio Platforms in order to expand into India's telecom sector and digital economy as well as to take advantage of India's growing demand for e-commerce platforms that sell essential goods. The

arrangement between Reliance Retail, Jio Platforms and Facebook owned WhatsApp will offer consumers the ability to access the nearest grocery stores, providing products and services to their homes by transacting with JioMart over WhatsApp.

*“Digital businesses offer a variety of new business models evading traditional obstacles, new opportunities for cooperation with local firms and non-equity modes of FDI in host countries.”*

Through FDI, digital businesses also encourage the growth of digital skills and knowledge in the host country. This happens through knowledge transfers that accompany FDI, but also through increased demand (acquisitions) of tech start-ups because of their high-skill talent. For example, Go-Jek, an Indonesian ride-sharing platform, recently acquired the Indian app developing start-up Leftshift technologies for their app-development team, which will now be shifting to Go-Jek headquarters in India.

Digital businesses also invest in data centres and content delivery networks to facilitate hosting of content closer to end-users. Content hosted locally loads faster, which increases uptake by users who may not wait for slow or unresponsive downloads, while also lowering the cost of accessing content by avoiding expensive international links. Investment in data centres can foster a healthy content ecosystem in the host country (UNCTAD, 2021). For example, Singapore-based Worldwide DC Solutions recently obtained an investment licence to develop its 1Hub data centre in Saigon Hi-tech Park (SHTP) with a total investment capital of US\$ 70 million.

At this juncture, it is vital to mention digital start-ups, which are growing at a rapid pace around the world, especially in Asia and the Pacific developing economies (ASEAN, 2018; KPMG, 2015a). Like larger digital businesses, digital start-ups can be either purely digital firms or mixed digital firms. Many of the region's economies have burgeoning tech scenes with start-ups and SMEs that leverage their technological knowledge and understanding of local and regional markets to launch new digital businesses. Foreign investors can play an important role in helping local digital start-ups upscale and expand their operations globally. This is an especially

<sup>4</sup> For more information, see Forbes, *Top 100 Digital Companies*. Available at <https://www.forbes.com/top-digital-companies/list/#tab:rank>.



important point for IPAs to consider when they develop FDI strategies – FDI from digital businesses is not only important, but so too is FDI into local digital businesses, especially start-ups.

Equally important is to strategically target FDI from successful digital start-ups operating overseas, since such “start-ups” can suddenly upscale to global dimensions, generating immense value for home and host economies through break-through technologies and access to high-end global tech networks” (KPMG, 2015b). Effectively generating leads and developing a local value proposition for foreign digital business and digital start-up investors will require

that IPAs not only keep abreast of the developments within their local and relevant foreign start-up environment, but that they also understand investor needs and opportunities so that they support mostly such firms.


As IPAs develop FDI strategies to attract FDI from and into digital businesses and start-ups, it is important that they consider examples of the types of investors in this category and the types of investments they make (table 7.3). This will help them to more effectively identify target investors going forward.



**Examples of digital businesses investments in Asia and the Pacific**

Internet platforms	Digital solutions	E-commerce	Digital content
<b>Meta (Facebook)</b> (United States of America)	<b>Alibaba Group</b> (China)	<b>Amazon</b> (United States of America)	<b>Netflix</b> (United States of America)
Opened a training centre in India to support local small business owners, creators, entrepreneurs and communities (2021).	Has opened a new customer service centre in Kuala Lumpur, Malaysia, to help customers transition to cloud usage.	Opened a last-mile delivery station in Tokyo, Japan to better serve the domestic market (July 2021).	Opened a live-action post-production facility in Mumbai, India (June, 2021). It has also leased a new production facility near Seoul, the Republic of Korea (January 2021).
<b>LinkedIn</b> (United States of America)	<b>Cisco</b> (United States of America)	<b>aCommerce</b> (Thailand)	<b>Thomson Reuters</b> (Canada)
Invested S\$ 80 million to open a new data centre in Jurong, Singapore (2016).	Moved its headquarters to the Australian Cyber Collaboration Centre (A3C) in Australia to create a critical infrastructure laboratory and a testing facility for all critical infrastructure operators located at A3C (2021).	Expanded its operations in Taguig, the Philippines (2018).	Opened a new subsidiary in Shenzhen, China to serve the Asia-Pacific market (2018).

Source: ESCAP, based on fDi Markets (2023) (<https://www.fdimarkets.com/>).



*“While attracting FDI to and from digital businesses requires a well-developed digital economy, in line with the demanding needs of investors, the pay-off for sustainable development and economic opportunities can be far-reaching.”*

When developing an FDI strategy to attract and promote FDI from and to digital businesses, investment policymakers and IPAs must also take into consideration the needs of the investors and what they prioritize in host economies. High-quality digital connectivity and digital infrastructure, high-quality digital skills, a stable and holistic regulatory framework for the digital economy, and ease of movement for cross-border working capital and venture capital flows are the most important host country location factors driving digital businesses’ investment decisions (Stephenson, 2020; ESCAP, 2022).

## 2. POLICIES TO ATTRACT AND FACILITATE DIGITAL FDI

Regional digital FDI inflows in the areas discussed above have remained above the US\$200 million mark since 2020 and they are likely to continue to expand if they are appropriately targeted and facilitated by the region’s policymakers and their respective investment promotion agencies (IPAs). *Appropriately targeted and facilitated* are the keywords here. For this to happen, and for digital FDI to contribute to an inclusive digital transformation of Asia-Pacific countries, policymakers, particularly in ICT ministries and the ministries regulating trade and investment, must coordinate with the national investment promotion agencies to design coherent digital investment strategies, incentives, and regulatory frameworks that will encourage foreign investors to invest. While this seems obvious, this has often not been the case, as many IPAs have been left out of national conversations on building the digital economy and the extent to which foreign direct investment can be leveraged for this purpose.

Before undertaking the appropriate policy actions and IPA activities to bring in investors, countries should carry out a needs and digital developmental assessment. The study should identify the type of digital FDI that is most needed in the relevant country context, based on the level of development of the

digital economy in the country and the country’s competitive strengths. For example, least developed countries with low levels of digital connectivity might not have much success in targeting data processing centres, as the basic requirements for that type of FDI and the priorities of the firms undertaking it will not be in place. Instead, such a country should first consider prioritizing digital FDI that focuses on building the necessary physical infrastructure to improve connectivity in the country. In comparison, a country that already has a relatively good level of digital infrastructure in place – perhaps a middle-income country with good connectivity, such as Thailand – and with a relatively high proportion of MSMEs that could benefit from adopting digital technology to better link into global and regional value-chains, should focus on promoting FDI that supports digital adoption. A country that has both good digital infrastructure and a high level of digital adoption – Singapore, for example – might focus more on promoting FDI from digital businesses.

It is important to note that countries can promote and facilitate FDI in more than just one category at the same time. In other words, investor targeting strategies and activities for each category of digital FDI are not mutually exclusive. In fact, they are interdependent – attracting FDI in digital business is poised to be unsuccessful if the digital infrastructure is not in place. Thailand, for example, might target both digital adoption and digital business at the same time. This may particularly be the case in Thailand’s bigger cities, such as Bangkok and Chiang Mai, where digital infrastructure is already very well developed and digital adoption is more advanced than in other parts of the country. The same could be true for a country like Singapore, which might focus on both promoting FDI in digital infrastructure, such as in data centres, and in digital businesses.



*“It is imperative that the responsible ministries and IPAs of host countries cooperate on a needs developmental assessment based coherent national strategy.”*

In terms of specific policy recommendations and investment promotion and facilitation measures to attract, promote and facilitate digital FDI, table 7.4 provides a summary of all policy recommendations for each digital economy area, and table 7.5 provides an overview of the actions that IPAs should take.

**Policy recommendations to attract digital FDI**

Digital infrastructure	Digital adoption	Digital businesses
Liberalize rules/regulations on FDI digital infrastructure.	Offer appropriately balanced fiscal and financial incentives.	Build digital skills through building partnerships with businesses.
Implement targeted enhancements in the regulatory regime.	Create an enabling framework for FDI by helping businesses to digitalize; and encouraging partnerships between the public sector and businesses to build digital skills.	Enhance the regulatory framework for FDI in digital business.
Create a detailed national broadband plan.	Digitalize industrial parks and SEZs.	Liberalize the rules on FDI in digital businesses.
Develop a policy framework for data centre development	Build digital skills through partnerships with businesses and other educational avenues.	Test regulatory attractiveness to foreign investors.
Reform Universal Service Funds.		Liberalize the rules on cross-border working and venture capital flows and enhancing the ease of doing business.
Lighten the fiscal and financial burden on digital infrastructure.		Improve physical connectivity in the host country.
		Ensure interoperability of national customs and logistics system.
		Offer appropriately balanced fiscal and financial incentives.

Source: ESCAP, based on “Policy guidebook on attracting and promoting FDI in the digital economy” 2023 (<https://www.unescap.org/kp/2023/policy-guidebook-attracting-and-promoting-fdi-digital-economy>).

Note that policy measures differ for each digital economy area, while actions for IPAs to undertake can be broadly categorized for each area.

In each area, a few common policy priorities emerge. For all three areas, the crucial first step that policymakers must focus on is to create a stable, modern regulatory framework that balances the needs of investors, consumers and the host country. For digital infrastructure, this entails a national broadband plan and sound policies on converged licensing, spectrum allocation, infrastructure sharing, universal service funds and number portability. For digital business and digital adoption, key enabling factors are digital connectivity, digital skills, the ease of doing business, and key policies and regulations related to e-payments and e-contracts as well as

data security and privacy, intellectual property protection and data localization. For each area, a stable, modern regulatory framework must be underpinned by regulatory coherence and foundational laws. The former means ICT ministries must also work with other public sector bodies regulating data protection, financial services, consumer protection, competition policy, spectrum sharing, broadcasting, and energy. The latter includes laws that (1) define e-commerce/digital business and recognize them as legitimate economic activities, (2) specify the types of firms that undertake such business, (3) recognize digital payments and digital documents, and stipulate firms’ responsibilities to their consumers and (4) the liabilities they will incur if these are breached.

Second, Governments should focus on liberalizing the sectors in which they are targeting to boost digital FDI.<sup>5</sup> Third, the public sector should partner with secondary schools, universities as well as local and foreign businesses to build digital skills that match the needs of their digital economy and its investors.

*“Regulatory reform, which is to be accompanied by pro-active investment promotion on the IPA’s side, should encompass and be based upon a modern regulatory framework, the liberalization of target sectors, and partnerships with schools, universities and businesses – whereas the regulatory framework balances the risks of liberalization.”*

Regulatory reform must be complemented by pro-active investment promotion and facilitation by IPAs. Winning digital economy investments can take years of patient and systematic effort, involving

lengthy and detailed planning, capital mobilization, government permission, supplier and employee contracting, and construction (WEF, 2014). Policy consistency and maturity are therefore essential. Many of the actions and measures that IPAs need to undertake to win digital FDI investments fall, at an overarching level, under the same category of actions, all of which are summarized in table 7.5.

In terms of each specific area of digital FDI, to attract foreign direct investors in digital infrastructure, IPAs must present them with interesting investment opportunities and a clear sense of the returns they are likely to make in the near-to-midterm. To attract foreign direct investors in digital businesses and digital adoption, IPAs must present each with a clear value proposition that draws on the host country’s unique attributes to respond to the target firm’s strategic objectives. In both cases, to achieve the greatest impact it is most important to approach prospective investors in structured contexts, such as



**IPA actions to attract, promote and facilitate digital FDI**

Ensure that the IPA has relevant experience in digital economy sectors and advocate for policy consistency.
Ensure policy consistency and enhance the ease of doing business through developing online one-stop shops, tech ecosystems and focusing promotion activities on technology.
Work with Governments and businesses to develop a local tech ecosystem.
Undertake strategic investor targeting.
Develop a unique local value proposition.
Undertake structured investor outreach and engagement activities at sector-specific or digital economy conferences.
Ensure a ‘Whole-of-Ecosystem’ approach to investment promotion and tech-ecosystem development.
Proactively publish digital infrastructure opportunities on the IPA website and on other notice platforms (for example, digital conference platforms, the SDG investment platform etc.).
Engage in networking opportunities, facilitate partnerships and collaboration with innovative start-ups and local partners, develop city partnerships and alliances.
Support digital transformation of FDI projects through smart readiness assessments.
Provide investment facilitation services and after-care.
Target home country internationalization programmes.

Source: ESCAP, based on “Policy guidebook on attracting and promoting FDI in the digital economy” 2023 (<https://www.unescap.org/kp/2023/policy-guidebook-attracting-and-promoting-fdi-digital-economy>).

<sup>5</sup> In addition to liberalization, policymakers should also revisit longstanding regulatory approaches to financial inflows and outflows by overseas investors, which have tended to centre on tight scrutiny and control of outward remittances including payments, royalties and profit repatriation, and rethink policies and strategies on transfer pricing.

through apex industry conferences, and to be introduced by ‘influencers’ such as banks/investment firms and industry experts. Once target firms have invested, it is crucial for IPAs to continue to engage closely with investors to identify and resolve problems, obtain policy feedback and nurture ongoing engagement with local firms. This encourages reinvestment and expansion, fostering backward linkage, growth and the further development of the local digital economy.

### 3. CONCLUSION

This chapter has outlined the characteristics and opportunities associated with the three core elements of digital FDI, provided examples of investment projects to visualize their practical impact and outlined a pathway for policymakers to grow digital FDI and develop their digital economy. The three core elements, and their promotion and attraction, are not mutually exclusive and are, in fact, inherently intertwined. Progress in the field of digital infrastructure is a precondition to foster growth and inflows in the fields on digital adoption and digital business, for example. This stresses once again the importance of:

- A coherent national strategy to cover all of the aforementioned aspects and foster a holistically appealing investment environment for digital FDI and economic development;
- The surveying domestic developments within the three fields of digital FDI and the digital economy to be able to adjust the national strategy, target investors pro-actively and promote the sectors in immediate need of development.

It has presented capital procurement and funding, technology acquisition and transfer as well as the creation of a spectrum of novel jobs as key opportunities of digital infrastructure development. In this, it has also emphasized the importance of developing digital infrastructure for economic

development and channelling FDI into this area. To help responsible ministries and IPAs prepare for this task, key priorities of investors in the field were provided, ranging from (1) the presence of a functioning modern licensing system, the availability of skilled engineers and local labour, over-efficient spectrum allocation, independent sector and competition regulation, the host country’s use of global digital infrastructure standards, to (2) an open, liberal FDI regime.

The chapter has identified cloud technologies, Industry 4.0 technologies, big data and analytics and mixed digital platforms, apps and digital subsidiaries as the main drivers of digital adoption. It has provided a snapshot of these key technologies and how FDI can contribute to their advancement and thereby to economic development. Furthermore, the main issue areas that policymakers ought to address, improve and provide to foster investments in the field of digital adoption have been pinpointed, including high-quality international and national digital connectivity and computing, high-quality digital skills, a burgeoning tech and start-up ecosystem, and a robust regulatory framework for the digital economy.

The distinctive features of digital business have been presented – digital production and delivery, asset and employment lightness, use and creation of platforms and networks, and the flexibility to rapidly scale-up operations and operate in a cross-sectoral manner – as well as the characteristics of their operations, i.e., increasing vertical integration. This clarified the importance of digital business as sources of funds, technology and ideas to help create and develop local digital firms. Policymakers ought to internalize that high-quality digital connectivity and digital infrastructure, high-quality digital skills, a stable and holistic regulatory framework for the digital economy, and ease of movement for cross-border working capital and venture capital flows are imperative when promoting, facilitating and channelling FDI into and from digital businesses in their economies for economic development.



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CHAPTER



# Way forward

In line with the discussions presented in the report, this chapter offers action-oriented policy suggestions related to trade and investment. It starts with overarching policy recommendations, which involve cooperation at both multilateral and regional levels. Subsequently, it proposes recommendations specific to each of the three pillars of sustainable development set out in this report, i.e., Growth, Inclusion, and Environmental sustainability. For all these pillars, the nexus between domestic regulations and international cooperation is underscored. Recognizing the necessity for complementary approaches in other policy spheres, this chapter also touches upon a non-exhaustive selection of recommendations going beyond the purview of trade and investment authorities, providing illustrative examples of areas where policy coherence across departments is needed.

## 1. OVERARCHING POLICY RECOMMENDATIONS: LEVERAGING MULTILATERAL AND REGIONAL COOPERATION MECHANISMS

### 1.1 Align digital trade and investment policy with WTO principles

- Ensure that policies and regulations surrounding digital trade and investment are consistent with foundational principles from the World Trade Organization (WTO) – transparency, non-discrimination. When pursuing legitimate public policy goals, the adopted measures should not excessively restrict trade.
- Refer to existing WTO agreements and provisions to guide digital trade and investment policies. For example, General Agreement on Trade in Services (GATS) provisions offer a relevant framework for digitally deliverable services, General Agreement on Tariffs and Trade (GATT) and Information Technology Agreement (ITA) are relevant for the trade of information and communication technology (ICT) goods. The technical barriers to trade (TBT) Agreement is applicable for setting technical standards affecting digital trade.

### 1.2 Leverage existing agreements, instruments and standards to accelerate regional digital trade cooperation

- Engage in regulatory dialogues and establish cooperation for “equivalence” or in mutual recognition agreements (MRAs), especially where universal standards are absent.
- Consider models used by main trade partners to create consistent and interoperable standards.
- Harness the flexibility of Preferential Trade Agreements (PTAs) to incrementally develop interoperable regulatory frameworks avoiding any shift towards digital protectionism.
- Prioritize of regional regulatory cooperation that fosters transparency, engages in regulatory dialogues to establish cooperation where universal standards are absent, and supports the establishment of regulatory portals to facilitate business compliance.
- Integrate capacity building into trade agreement design and implementation.

### 1.3 Expedite implementation of trade facilitation and digitalization agreements and adoption of international standards

- Complete the implementation of the WTO’s Trade Facilitation Agreement (WTO TFA).
- Accelerate the accession and implementation of the Framework Agreement on Facilitation of Cross-border Paperless Trade in Asia and the Pacific (CPTA).
- Adopt or align with United Nations Commission on International Trade Law (UNCITRAL) Model Laws when devising policies for policies and laws on digital trade facilitation and electronic transactions.

## 2. DIGITAL TRADE AND INVESTMENT POLICIES FOR GROWTH – BUILDING EFFICIENT, SAFE, AND TRUSTED DIGITAL TRADE

### 2.1 Address the digital infrastructure gap

- Increase coherence between trade, investment, and ICT policies to tackling the digital infrastructure divide.
- Ensure telecommunications regulations are consistent with the GATS, its telecommunications annex, and the telecom reference paper. The core principle is to ensure that the telecommunications landscape remains open and competitive, and the regulatory process is transparent. Some examples of measures in this endeavour are requiring network operators and service providers to share infrastructure, implementing effective spectrum management, and promoting competitive tendering.
- Actively consider reducing import duties on ICT equipment in line with the ITA.
- Simplify the process for obtaining necessary approvals and permits for investing, importing, and exporting ICT goods and services.
- Adopt technical standards that align with those established by recognized organizations such as the International Telecom Union (ITU). Engage in regional and global dialogues on ICT rules and standards, including those facilitated by the ITU and the Global System for Mobile Communications Association (GSMA).
- Strengthen public-private investment and collaboration for digital infrastructure. Public investment should focus on areas where the private sector might not have incentives to invest, like remote rural locations. Encourage co-investment strategies between Governments and businesses to spur investment in areas that are currently underserved.
- Align policy efforts and measures with investor priorities to maximize private sector contribution to the development of adequate digital infrastructure.

### 2.2 Online consumer protection

- Develop a comprehensive online consumer protection framework that covers all online transaction stages: pre-purchase (advertising, information), purchase (contract terms, payment security), and post-purchase (dispute resolution).

### 2.3 Data privacy standards

- Recognize “equivalency” or “adequacy” of privacy regimes.
- Enhance cross-border cooperation between privacy authorities.
- Integrate data privacy provisions into trade agreements to unify data protection standards.
- Engage in policy dialogues with key trade partners to establish regulatory cooperation.

### 2.4 Cybersecurity

- Encourage organizations to adopt digital security risk management and implement international security standards, like ISO 27000 series.
- Reduce services trade restrictions in computer professional services to address digital security skill shortages.

### 2.5 Standards, IP, and investment provisions for innovation and Industry 4.0

- Align national regulations with international guidelines on intellectual property (IP) and TBT related to Industry 4.0 technologies.
- Clearly define IP regulations, including their limitations and exceptions, to bolster investor confidence and support early innovators.
- Enhance the capabilities of national IP institutions to offer the necessary infrastructure for the creation, commercialization, and enforcement of assets in a digital tech-driven landscape.
- Invest in and ensure the availability of high-quality digital skills amongst the labour force, via training programmes, the incorporation of digital

skills into the curricula of secondary and tertiary education, and the encouragement of exchange programmes and company training schemes.

- Ensure that companies are involved in the development of digital skills programmes – both in terms of curricula development as well as in offering courses when and where relevant.
- Collect, analyse and publicly share data on the status of digital skills in the country (including the number of graduates, skill specialties and salary levels) to encourage and reinforce continued private investment into digital sectors.
- Enable and ensure ease of movement for cross-border working capital and venture capital flows to raise the confidence of digital businesses in the innovation and start-up ecosystem. This must also include the development of adequate policy and legal frameworks for such investment.

## 2.6 Investment regulations

- Develop a robust and coherent regulatory framework for investments in the digital economy. This should entail the following corner stones:
  - An open FDI regime, and;
  - Adherence to international standards.
- Coordinate with the national and subnational IPAs to ensure investment promotion and attraction activities are aligned with both the regulatory environment and actual reality. A straightforward and aligned set of rules and efforts help foreign investors to navigate the investment environment easily.
- Monitor and evaluate the current status of investments in the digital economy to adjust policy measures if need be.

## 3. DIGITAL TRADE AND INVESTMENT POLICIES FOR INCLUSIVITY

### 3.1 Enhance cross-border e-commerce engagement of MSMEs

- Simplify trade procedures for enhancing cross-border parcel movement, and efficiently managing returned goods.
- Foster international collaboration with both public and private entities to combat import duty

evasion in digital trade, rather than phasing out duty-free schemes. It is recommended to maintain a tariff-free environment for electronic transmission and low-value consignments, complemented by a sales tax system to ensure fair competition, until Governments gain a better and more comprehensive understanding of the nexus between taxes, digital trade, and inclusive development. Simultaneously, international collaboration to establish a globally accepted tax framework should be actively considered.

- Promote the adoption of digital technologies and enhance the digital trade competitiveness of MSMEs. These comprehensive approaches may include tax and financial incentives, training, information dissemination and business matching support.
- Establish an integrated information-sharing channel to keep the private sector, especially MSMEs, updated on cross-border regulatory changes. It is essential to provide adequate legal guidance and to efficiently disseminate information about new rules – both domestically and in trade partner countries.

### 3.2 Empower marginalized groups

- Adopt an evidence-based, targeted approach when integrating marginalized groups into digital trade and investment policies. Support should be grounded in comprehensive need assessments tailored to the requirements of marginalized groups and the specific nuances of the areas.
- Consider crafting a specific provision in PTAs that advocates for non-discrimination and joint capacity-building, aimed at enhancing the participation of marginalized groups, including women, in digital trade. The provision should use specific, binding, and clear language when addressing commitments, and locate in sections or chapters that emphasize their significance. Collaboration with development partners is also crucial to assess the impact of digital trade regulations and PTAs on these groups, carry out evaluations for customized assistance and oversee programme results.
- Conduct need assessments, and subsequently provide targeted training for women and girls in relevant areas, along with offering market insights and online selling guidance.



- Elevate the profile of marginalized groups within the digital trade and investment sector by providing platforms for them to showcase their products and skills via networking events and media exposure. Specifically, advocate for increasing their participation in networking sessions, trade and investment exhibitions, and marketing endeavours.
- Spotlight pioneers in digital trade and investment from marginalized groups, and promote the exchange of best practices for business growth, entering export markets, and attracting foreign investment. Drawing insights from the UNCTAD eTrade for Women and the ESCAP Gender and FDI initiatives can be useful.

### 3.3 Promote an open trade and investment environment for digital healthcare and online education

- Promote trade and private investment in health and education services, including cross-border online delivery modes. Efforts should involve removing barriers to international service provision, such as strict licensing and mandatory local presence requirements. This also requires introducing accreditation procedures and establishing international guidelines for professionals in these sectors, which is essential for quality assurance. In addition, fostering regional partnerships can help in developing an international accreditation system, ensuring consistency in professional qualifications, licences, and standardizing practices across countries.
- Embrace international data privacy standards, while also facilitating necessary international data exchanges.
- Prioritize investments in digital infrastructure, giving priority to underserved regions, to guarantee comprehensive access to digital health and online educational services.
- Ensure equal access to modern, flexible education. Beyond foundational knowledge, it is essential to cater to the needs of shifting skill demands. National educational strategies should emphasize lifelong learning, particularly for those facing outdated skills. Government collaboration with educational institutions, training providers, employers, businesses and development

partners is important for facilitating skill adaptation within the workforce. Strategies could encompass providing tax incentives, streamlining the re-entry process for adults into formal education, and acknowledging competencies gained from post-primary training.

### 3.4 Address digital-economy worker challenges through international cooperation

- Utilize opportunities from trade negotiations to examine the effects of DEAs and digital economy-related chapters in PTAs on worker conditions.
- Adopt international guidelines, like the World Economic Forum's Charter of Principles for Good Platform Work and the ILO Tripartite Declaration, to establish inclusive and ethical labour practices across traditional and digital economies.
- Strengthen collaboration with platform enterprises and governmental bodies to establish standardized guidelines for legitimizing cross-border employment of digital-economy workers. This calls for an in-depth alignment of standards and protocols tailored for cross-border digital economy workers, coupled with tax, digital identity and data privacy agreements.
- Develop clear tax guidelines for the cross-border provision of digital services to prevent double-taxation risks. Implementing the United Nation's model tax treaty can standardize the taxation approach for income generated from remote services.
- Tailor national education strategies to match the evolving needs of the digital workforce. Although there is some ambiguity regarding the precise skills modifications required for succeeding in the digital workspace, the following skill categories are essential:
  - Practical skills for managing online businesses, including expertise in product listing enhancement, marketing strategies, inventory oversight, comprehending online payment mechanisms, shopping cart management and legal adherence;
  - Foundation training in the science, technology, engineering, and mathematics (STEM) is crucial for preparing a highly-skilled workforce for the digital era;

- ICT proficiency and its related competencies are fundamental. This ranges from cultivating problem-solving abilities from early educational stages to fostering advanced ICT skills at the tertiary level. Collaborative efforts with the private sector should inform the design of degree programs in web development, coding and programming. Given the dynamic nature of the digital sector, it is worth evaluating and potentially recalibrating the duration of ICT degree programs to better suit the shifting demands of the digital job market. Initiatives to establish platforms for placing freshly trained ICT graduates into appropriate roles should also be explored.

## 4. DIGITAL TRADE AND INVESTMENT POLICIES FOR ENVIRONMENTAL SUSTAINABILITY

### 4.1 Foster a circular economy through open digital trade and investment

- Advancing digital trade growth and forging a smart, circular economy are synergistic. Both endeavours require secure digital infrastructure, good data governance, standardized guidelines and interfaces for interoperability and seamless data transfers across interconnected devices, networks, economies and jurisdictions.
- Reevaluate regulations that create hindrances for trade and investments in environmental goods and service, such as waste treatment, repair, remanufacturing and recycling services and equipment. This includes reducing licensing fees and legal ambiguities.
- Align regulations concerning technical standards, including labelling and waste treatment for recycling of electronic products and e-commerce packaging, with international standards and the TBT Agreement. Ensure alignment of policy measures and enforcement with global environmental agreements like the Basel Convention.
- Collaborate with agreement partners to develop specific provisions in trade agreements to promote harmonized environmental regulations and standards. This includes agreeing on the specific definitions and scope of environmental

goods and services. While reaching hard commitments will take time, soft commitments for collaboration, such as initiatives among proactive regional members to identify best business practices and consistent standards related to waste trade can be useful.

### 4.2 Establish a harmonized approach to trade facilitation for traceability of goods throughout their lifecycles and legal e-waste movement

- Trade digitalization can help improve the traceability of goods across borders throughout product lifecycles. This includes adopting a paperless procedure for notifying and obtaining consent for e-waste exports. Streamlining the notification process can free-up resources for border officials and increase transparency in monitoring illicit e-waste transactions.
- Actively participate in international coordinated efforts to clearly distinguish between resources and ‘waste’ in international trade, and conform to international standards for repair, reuse, remanufacturing and recycling. For example, adopt the World Customs Organization’s (WCO) Harmonized System (HS) 2022 amendments, which outline specific e-waste classification provisions.

## 5. CONCLUSION

In wrapping up, a consistent theme throughout the report is that **unleashing digital trade and investment for sustainable development requires giving particular attention to the regulatory impacts on consumers, small firms, workers, and the environment**. Fundamental to achieving this are the coherence of both traditional and digital trade and investment policies with sustainable development aspirations, and regulatory cooperation with key trade and investment partners.

Central to these strategies is the need for a streamlined, open regulatory framework. This requires avoiding regulations that unduly increase compliance costs for businesses. Such a regulatory environment is particularly advantageous for small enterprises, which are pivotal for achieving inclusive growth outcomes. Simplifying processes associated

with business establishment, licensing, permits and their associated costs and durations becomes crucial. Moreover, the importance of creating mechanisms that encourage regulatory cooperation and interoperability cannot be overstated. Aligning technical requirements within regulations with international standards and mutual recognition arrangements guarantee a level of international consistency and interoperability.

For a conducive setting for digital trade and investment, a holistic policy approach is important.

This entails co-ordination among various agencies, unwavering commitment to transparency, and engaging public consultations (see table 8.1 for the summary).

Lastly, as the regulatory environment evolves, preparing enforcement agencies for upcoming changes is crucial. Specialized training programmes can empower these institutions, enabling them to efficiently enact and promote the newly established or revised regulations. ESCAP, UNCTAD and UNIDO are poised to assist in this endeavour.



Policy recommendations matrix

Focus	Recommendations
Leveraging multilateral and regional cooperation mechanisms for digital trade and trade	<b>Align digital trade and investment policy with WTO principles</b> <ul style="list-style-type: none"> <li>● Refer to existing WTO agreements and provisions to guide digital trade and investment policies.</li> <li>● Adhere to the principles of transparency and non-discrimination.</li> <li>● Ensure that while addressing public policy goals, trade and investment is not unduly restricted.</li> </ul>
	<b>Leverage existing agreements, instruments and standards to accelerate regional digital trade cooperation</b> <ul style="list-style-type: none"> <li>● Engage in regulatory dialogues and cooperation to ensure consistent standards with leading trade partners for interoperability.</li> <li>● Establish mutual recognition of 'equivalence' in standards or procedures.</li> <li>● Leverage PTAs for developing interoperable frameworks, steer clear of protectionism.</li> <li>● Emphasize transparency in regional cooperation, and actively participate in regional dialogues to establish regulatory cooperation where international standards are absent.</li> <li>● Establish regulatory information portals to facilitate compliance.</li> <li>● Integrate capacity building into trade agreement design and implementation.</li> </ul>
	<b>Expedite implementation of trade facilitation and digitalization agreements and adoption of international standards</b> <ul style="list-style-type: none"> <li>● Complete the implementation of the WTO TFA.</li> <li>● Accelerate the accession and implementation of the CPTA.</li> <li>● Adopt or align with UNCITRAL Model Laws when devising policies and laws on digital trade facilitation and electronic transactions.</li> </ul>
Economic growth – Building efficient, safe, and trusted digital trade	<b>Address the digital infrastructure gap</b> <ul style="list-style-type: none"> <li>● Align telecom regulations with GATS and Telecom Reference Paper.</li> <li>● Consider lowering import duties on ICT equipment.</li> <li>● Simplify processes for ICT investments and trade.</li> <li>● Adopt ITU-recognized technical standards.</li> <li>● Participate in dialogues such as ITU and GSMA-led global ICT dialogues.</li> <li>● Public-private co-invest in infrastructure for underserved areas.</li> <li>● Improve a functioning licensing system, efficient spectrum use and global standards.</li> <li>● Promote private sector contribution by implementing independent regulation and maintaining an open stance towards FDI.</li> </ul>
	<b>Online consumer protection</b> <ul style="list-style-type: none"> <li>● Implement a comprehensive regulatory framework that covers from pre- to post- purchase issues.</li> </ul>
	<b>Data privacy standards</b> <ul style="list-style-type: none"> <li>● Recognize equivalency/adequacy of privacy regimes.</li> <li>● Enhance cooperation among authorities.</li> <li>● Utilize PTA mechanisms and international dialogues.</li> </ul>
	<b>Cybersecurity</b> <ul style="list-style-type: none"> <li>● Implement ISO 27000 series.</li> <li>● Remove trade restrictions in computer professional services.</li> </ul>

**Table 8.1.** (continued)

Focus	Recommendations
Inclusivity	<b>Innovation and Industry 4.0</b> <ul style="list-style-type: none"> <li>● Align national regulations with international standards and TBT provisions.</li> <li>● Implement laws protecting IPRs, including defined exceptions.</li> <li>● Enhance the enforcement capabilities of national IP institutions.</li> <li>● Invest in top-tier digital skills; involve companies in training and share skill data.</li> <li>● Streamline cross-border capital flows and bolster start-up confidence with a robust policy environment.</li> </ul>
	<b>Investment regulations</b> <ul style="list-style-type: none"> <li>● Establish a robust regulatory framework for digital investments with a liberal FDI approach, and adherence to global data and connectivity standards.</li> <li>● Synchronize national and sub-national IPAs to ensure clear investment rules.</li> <li>● Regularly review and adapt policies as needed.</li> </ul>
	<b>E-commerce engagement of MSMEs</b> <ul style="list-style-type: none"> <li>● Streamline trade processes for cross-border parcels and returns.</li> <li>● Collaborate internationally to address duty evasion.</li> <li>● Maintain a tariff-free stance for electronic transmissions and offer de minimis duty exemptions, complemented by a sales tax system.</li> <li>● Simplify regulations to reduce compliance costs.</li> <li>● Boost MSME digital trade competitiveness via incentives, training and support.</li> <li>● Set up a unified info-sharing system for MSMEs on regulatory changes.</li> <li>● Create online networking portals to foster connections and visibility of MSMEs.</li> </ul>
	<b>Empower marginalized groups in digital trade</b> <ul style="list-style-type: none"> <li>● Evidence-based targeted assistance programmes.</li> <li>● Incorporate explicit, binding provisions in key sections of PTAs, emphasizing collaboration with development partners to champion non-discrimination, capacity-building and impact evaluation for marginalized groups.</li> <li>● Boost visibility of marginalized groups in digital trade through networking events and media. Spotlight their pioneers and share best practices.</li> </ul>
	<b>Leverage digital trade and investment in health-care and education services</b> <ul style="list-style-type: none"> <li>● Remove trade and investment barriers like strict licensing and establish collaboration for mutual recognition of standards and accreditation.</li> <li>● Adopt international data privacy standards and enable crucial data exchanges.</li> <li>● Invest in digital infrastructure, prioritizing underserved areas, to ensure widespread digital health and online education access.</li> <li>● Align education with market needs through co-ordination between educational entities, employers and partners.</li> <li>● Provide incentives for life-long learning, including tax benefits, easy access for adults to formal education, and recognizing post-education training.</li> </ul>
	<b>Address digital-economy worker challenges</b> <ul style="list-style-type: none"> <li>● Integrate an impact assessment of DEAs and PTAs on workers' conditions into trade agreement designs, and implementation.</li> <li>● Adhere labour practices with international guidelines</li> <li>● Collaborate with the private sector and global platforms to formalize cross-border digital work, considering tax, digital identity, and data privacy.</li> <li>● Set clear tax guidelines for cross-border digital services to avoid double taxation and align with the United Nations's model tax treaty.</li> <li>● Adjust national education strategies to fit the digital workforce's evolving needs.</li> </ul>

**Table 8.1.** *(continued)*

Focus	Recommendations
<b>Environmental sustainability</b>	<b>Foster a circular economy through open digital trade and investment</b> <ul style="list-style-type: none"> <li>● Recognize the intertwined nature of digital trade and the circular economy, anchored by secure digital infrastructure, robust data governance and smooth data transfer.</li> <li>● Simplify regulations that obstruct trade in environmental goods/services, especially in waste treatment, and recycling. Additionally, work towards reducing licensing costs and clarifying legalities.</li> <li>● Standardize e-product recycling and e-commerce packaging in line with the WTO TBT Agreement, and ensure alignment of policy measures and enforcement with global environmental agreements like the Basel Convention.</li> <li>● Leverage trade agreement to establish harmonized environmental standards and foster collaboration related to waste trade.</li> </ul>
	<b>Establish a harmonized approach for traceability of goods throughout their lifecycles and legal e-waste movement</b> <ul style="list-style-type: none"> <li>● Implement paperless trade processes for tracking goods across product lifecycles and simplifying the process of notifications and permit acquisitions for e-waste exports.</li> <li>● Adopt the WCO's HS 2022 amendments, which outline specific e waste classification provisions.</li> </ul>



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Director

Trade, Investment and Innovation Division

Economic and Social Commission for Asia and the Pacific (ESCAP)

United Nations Building, Rajadamnern Nok Avenue

Bangkok 10200, Thailand

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*The Asia-Pacific Trade and Investment Report (APTIR) is a biennial publication prepared by the Trade, Investment and Innovation Division of the United Nations Economic and Social Commission for Asia and the Pacific to provide insights into the impact of recent emerging developments in trade and foreign direct investment on countries' abilities to meet the challenges of achieving sustainable development.*

*The theme of APTIR 2023/2024 is "Unleashing digital trade and investment for sustainable development." Prepared in collaboration with the United Nations Conference on Trade and Development and the United Nations Industrial Development Organization, the report explores the roles of digital trade and investment in guiding the Asia-Pacific region towards sustainable development. It examines digital trade and investment patterns in the region and provides an overview of the digital trade and investment policy environment, viewed through a sustainable development lens. The report also assesses the potential of unilateral policies on trade and investment, as well as the impact of multilateral and regional cooperation, in maximizing the benefits of digital trade and investment while focusing on the Sustainable Development Goals (SDGs). Incorporating a quantitative assessment, this study evaluates the role of digital trade in achieving the SDGs and examines the impact of various policy scenarios. Building on this understanding, the report concludes by offering a series of action-oriented policy recommendations, specifically targeting the trade and investment domains, to ensure that digital and investment policies effectively unlock the potential of digital trade and investment for sustainable development.*

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