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Policy Guidebook on Attracting and Promoting FDI in the Digital Economy
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1. Introduction

Foreign direct investment (FDI) can significantly contribute to the sustainable development of both home and host countries in several important ways, i.e., through expanding production and access to markets, bringing in foreign exchange, contributing to skills development/human capital growth, technology transfer and increasing competition in local markets. It can also support industry upgrading and facilitate regional and global value chain integration, including small and medium-sized enterprises, and can even trigger outward FDI by local enterprises. Consequently, it is possible for Governments, either directly or through their investment promotion agencies (IPAs), to promote and facilitate FDI which targets their country’s specific sustainable development priorities. For example, some countries see FDI as a means to create more employment opportunities and transfer capital, while other countries see it more as a vehicle to generate a change in the structure of their economies.
through encouraging diversification, competition and digital transformation.

Regardless of which sustainable development effect countries aim to generate through FDI, two things are clear in today’s socio-political and economic climate:

1. FDI will be an especially important resource for all economies in building back better in the COVID-19 recovery period; and
2. The digital transformation of our economies is fundamentally transforming people’s lives and creating new ways for all economies to attract, promote and facilitate FDI.

The COVID-19 pandemic accelerated the digital transformation, especially in developing countries. Measures enacted by Governments to contain the pandemic propelled businesses towards digitalization and the provision of online operations and services. At the same time, demand for digital services has exponentially grown. Firms that were more digitally agile adapted to this new environment most successfully, while those that had not started to focus on digitally skilling-up their business models.1

At the policy level, several countries in the Asia-Pacific region have already begun developing and even implementing national digital economy strategies and policies, but FDI is often left out of these plans. Yet, developing robust digital infrastructure and improvements in, and access to digital education and training systems will require extensive public and private sector investments, including FDI. Policymakers in the various line ministries responsible for each component of the digital economy must therefore coordinate with the national IPA to design a coherent digital investment strategy and regulatory framework as a part of the wider national digital economy plan.

This guidebook aims to support policymakers in their endeavor to do just that. It identifies three areas in which FDI can support host country digital transformation: building digital infrastructure; supporting the digital transformation of traditional firms, in particular MSMEs and value-chain linked firms; and supporting the development of indigenous digital businesses. A key priority of this guidebook is to help policymakers understand each of these three areas as well as how FDI can contribute to their further development, and what would entice foreign direct investors to invest in one or more of these areas in a desirous host country. By understanding the evolving context, trends and investor needs, policymakers in line ministries and IPAs can jointly develop coherent investment policies to target and promote FDI in the digital economy more effectively. Since levels of digital economy development vary across countries, the types of digital FDI they will seek to attract and promote, and the actions they need to attract it will differ. For this reason, this guidebook also provides a set of policy recommendations specific to each area in which FDI can support digital economy development.

The remainder of this introduction provides a brief overview of the three areas that ‘digital FDI’2 can contribute to national digital economy development, and highlights FDI trends in these areas. It concludes by providing an outline for the remainder of the guidebook.

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2 This study uses the term digital FDI to refer to FDI in the digital economy. The term was originally coined by Matthew Stephenson at the World Economic Forum 2020 in Policies, measures and regulations to attract FDI in the digital economy. World Economic Forum White Paper. Available at: https://www3.weforum.org/docs/WEF_Digital_FDI_2020.pdf.
2. Digital FDI – what is it?

As discussed above, digital FDI, has the potential to positively contribute to a host economy’s digital development in the following three ways:

(a) Digital infrastructure investments – FDI can help to build the physical infrastructure and consumer services of telecommunications and the Internet. Firms and investors operating in this area of the digital economy include telecom firms that provide telecommunications infrastructure and connectivity, and IT companies that manufacture and sell connectivity devices and constituent components (digital hardware) and which develop the software for digital communications. Examples of digital infrastructure companies include AT&T, Verizon and Microsoft;

(b) Digital adoption investments – FDI can encourage local businesses, Governments and institutions use digital infrastructure to transition to digital technologies and services, either within their own operations, or in the digital products and services they bring to market. These types of investments typically target or are undertaken by more traditional (less digital) firms, and enable them to adopt digital technologies in different areas of their work to boost efficiency, speed, global competitiveness and digital innovation. Such, FDI supports digital adoption and upgrading by more traditional firms, can help speed digitalization in physical sectors of the economy. For example, both Siemens and Nestle used FDI to digitalize their production processes in their overseas operations.

(c) Digital businesses harness the Internet to develop and deliver digital products and services to the broader economy of consumers, businesses, Governments and institutions. They include purely digital firms, such as Internet platforms and providers of digital solutions, that operate entirely in a digital environment, and mixed firms such as e-commerce platforms and digital content providers that combine a prominent digital dimension with a physical one. Examples of purely digital businesses include Meta (Facebook) and PayPal, while examples of mixed digital firms include Uber and Netflix.

3. Digital FDI trends

Global FDI flows into the digital economy have grown steadily since 2010 (UNCTAD, 2017; UNCTAD, 2022), driving – and fuelled by – strides in global digital connectivity and consumer uptake. Annual global Greenfield FDI in core digital economy sectors (i.e., communications, computer and business machines, software and IT, electrical and electronic components, and semiconductors) doubled from US$119 billion in 2011 to US$231 billion in 2021. However, Greenfield FDI in communications and semiconductors have seen the sharpest upswing since 2019 (figure 1), when the COVID-19 pandemic compelled the world to turn to digital technology in order to keep working during widespread illness and lockdown.

Annual Greenfield FDI inflows into the communications sector jumped from an annual average of US$40 billion in 2016-2019 to US$72.2 billion in 2021 (figure 1) to

---

3 ESCAP calculations, based on fDi Markets data.
4 This includes wired and wireless telecommunications, communications equipment, data processing hosting and related services, other telecommunications, and motion picture and sound recording industries.
CHAPTER 1 ▲ INTRODUCTION – FOREIGN DIRECT INVESTMENT IN THE DIGITAL ECONOMY

Digital FDI Guidebook

meet the burgeoning demand for digital infrastructure and devices. This same demand caused annual Greenfield investments into semiconductors and semiconductor machinery to suddenly rocket to US$83 billion in 2021. Resultantly, the communications and semiconductors industries emerged as the second and third largest recipients of global Greenfield FDI for the first time.5

The surge in Greenfield FDI in the communications sector was driven by dramatic growth in data processing and hosting investments (figure 2) intended to quickly upgrade and expand digital connectivity. Annual Greenfield inflows into data centres and related activities burgeoned from US$30 billion in 2018 to US$48 billion in 2021, even as investments into the traditional drivers of growth in the communications sector – such as wired and wireless telecommunications and communications equipment – plateaued or declined.

Other core digital economy sectors experiencing steady growth in Greenfield FDI in the past decade were software and IT6 services and electrical and electronic components7 (figure 1). In this past decade, software and IT services have accounted for

---

6 This includes software services except video games, video games, custom computer programming services, other software and IT services, Internet publishing and broadcasting and web search.
7 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.
CHAPTER 1 ▲ INTRODUCTION – FOREIGN DIRECT INVESTMENT IN THE DIGITAL ECONOMY

The largest share of annual global Greenfield FDI investments by number (UNCTAD, 2022) as the digital economy has continued to expand – a share that has grown from 17 per cent in 2016 to 23 per cent in 2022.8

In the electronic and electronic components sector, Greenfield FDI growth has been driven by a sudden jump in inflows into battery production, from an annual average of US$1.7 billion in 2011-2017 to US$14.8 billion in 2018-2021 (figure 3), driven in part by booming demand for data-enabled mobile phones and other digitally-connected devices. Greenfield FDI growth in this sector is also being driven by an upturn in investments in the electrical equipment and electronic components necessary to build and run telecommunications and digital connectivity networks.

Mergers and acquisitions are also driving FDI into the digital economy, which accounts for some of the world’s largest M&A deals during the past decade. Examples include Verizon Communication’s acquisition of Vodafone’s 45 per cent stake in Verizon Wireless for US$130 billion,9 AT&T’s takeover of Time Warner for US$85 billion10 and Microsoft’s deal to buy Activision Blizzard for US$69 billion.11 Digital businesses tend to use M&As more than traditional firms to enter new markets and sectors (UNCTAD, 2022).

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8 ESCAP calculations, based on fDi Markets data.
9 See https://www.usatoday.com/story/money/business/2013/09/02/vodafone-verizon-deal-done/2755007/.
These same broad patterns are evident in ESCAP’s member States in the Asia-Pacific region, where annual Greenfield FDI flows into core digital economy sectors have grown from US$43 billion in 2011 to US$76 billion in 2021 (figure 4). Here, too, a sudden, sharp upswing in semiconductor investments in 2020 was responsible for the surge in FDI (figure 4). Since Asia has long been an established global semiconductor manufacturer, digital infrastructure and digital device firms dramatically stepped up their investments in the region to meet surging global demand. For instance, the United States’ Intel and Micron Technology are investing US$7 billion each to create semiconductor plants in Malaysia and Japan, respectively; and GlobalFoundries (UAE) is investing US$4 billion to build a chipmaking plant in Singapore. Not surprisingly, the semiconductor sector drew half of total Greenfield FDI into ESCAP’s Asia-Pacific member States in 2021, up from a quarter in 2011.

These countries have also witnessed a steady upward trend in Greenfield FDI in the electrical and electronic components needed to build digital infrastructure and digital connectivity devices (figure 4), although communications and software and IT services appear to have plateaued.

Large M&A deals are also driving FDI in the region’s digital economy. Recent examples

Source: ESCAP, based on fDi Markets data.

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13 ESCAP calculations, based on fDi Markets data.
include Altimeter Growth’s US$40 billion acquisition of Singapore’s Grab Holdings, and Facebook’s acquisition of a 9.99 per cent share of India’s Reliance Jio for US$5.7 billion.

4. Outline of the policy guidebook

The next three chapters introduce each of the three areas for FDI in the digital economy in more detail. Each chapter draws on desk research and interviews with digital economy investors and investment promotion officials in the Asia-Pacific region, and international digital economy experts, to highlight digital FDIs’ varying needs from prospective host economies to enable the design of targeted investment policies and investment promotion strategies.

Chapter 2 on digital infrastructure focuses on firms that invest across borders in digital infrastructure. Broadly, these are telecommunication network and telecommunication services firms, connectivity device firms, and data storage and processing firms. When considering overseas investment locations, this group of firms must prioritize the ease of obtaining operating licences, the local availability of skilled talent, international technical harmonization, regional infrastructure coordination and regulatory openness to foreign direct investment. The rapid expansion of mobile data connectivity also makes the cost and availability of the spectrum as well as infrastructure sharing increasingly important. Other major considerations are whether the prospective host country has an open competitive market, independent regulation and a reasonable taxation system.
Chapter 3 on digital adoption reviews the expanding digitalization of traditional ‘brick-and-mortar’ firms, which have historically driven FDI globally. Growing competition from digital businesses is compelling such firms to adopt digital technologies and Internet-based operating models to stay competitive. Attracting digitalized investments from these firms will help to grow the digital economy by speeding and expanding the digitalization of physical sectors of the economy. When considering overseas investment locations, digitalizing businesses look for many of the same host country attributes as digital business. Leading among these are high-quality digital connectivity, digital skills, a modern regulatory framework for the digital economy protecting corporate and customer data, and e-payment systems.

Chapter 4 on digital businesses outlines the unique and novel features of digital businesses, whose products and services fundamentally centre on the Internet. These features drive digital businesses rapid international expansion, growing economic dominance and deepening interrelationship with FDI. Since digital business needs the Internet to exist, high-quality digital connectivity is its leading concern when considering overseas investments and host locations, closely followed by the local availability of skilled talent. In addition, keys are a stable, modern and holistic regulatory framework for the digital economy, and the existence of a local venture capital and tech ecosystem.

Chapter 5, the concluding chapter, illustrates key policy priorities and recommendations for Asian and Pacific policymakers and IPAs in each of these areas.
2.1. Introduction: FDI in digital infrastructure

Digital infrastructure is the hardware and software used to generate, transmit and receive data signals, nationally and internationally. Digital infrastructure is composed of:

- Transmission hardware, including telecom towers, terrestrial fibre cable, international sub-sea cable, data interconnection points, and small cell transmitters for last-mile connectivity. This category also includes satellites transmitting broadband (UNCTAD, 2017; ITU, 2019b, AIIB, 2020).

- Data generation and reception hardware, comprising human-operated digital connectivity devices such as smartphones, computers, laptops and tablets, and machine-operated Internet of Things terminals and equipment (including network edge devices such as sensors, robots, and autonomous and semi-autonomous vehicles) (UNCTAD, 2017; ITU, 2019b, AIIB, 2020).

- Data storage and processing hardware, consisting primarily of centralized or decentralized data centres (AIIB, 2020).
As economies in Asia and the Pacific look to cultivate their digital economies, FDI can play an important role in building and upgrading existing digital infrastructure, and in helping Asian and Pacific economies close their digital divides. Recognizing this, IPAs in the region have been undertaking promotion and facilitation activities to boost the flow of FDI into digital infrastructure for several years already. However, the time and resources dedicated to attracting such FDI has increased since the COVID-19 pandemic (OECD, 2021).

The COVID-19 pandemic has highlighted the urgent need for increased investments in more and better digital infrastructure and data generation, and reception hardware in countries in special situations (CSS). At the same time, more advanced developing countries in Asia and the Pacific will need to focus on attracting FDI in data storage and processing hardware. As Internet use becomes more data-intensive and spreads into rural and underserved areas, data storage and processing capacity must be expanded to locate this infrastructure close to all end-users and enable ‘edge computing’ applications. Asia will also need to invest in Internet Exchange Points (IXPs) and undersea cables to facilitate local and international data flows (ESCAP, 2021; ITU, 2021g).

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 Axicom.

Competition for FDI into digital infrastructure can be particularly fierce, 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.

2.2. How can host economies benefit from FDI in digital infrastructure?

Host economies can benefit from FDI in digital infrastructure in a variety of ways. Firstly, it 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 capital short – 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.

---

15 ‘Edge computing’ is data processing and computation as close to the end-user as possible to reduce latency and support use of data intensive technologies, such as IoT.
16 Internet Exchange Points enable different Internet service providers and digital content providers to exchange data traffic with each other so that it reaches the end-consumer.
17 Members of ESCAP’s FDI Network, which includes investment policymakers and IPAs from 43 of ESCAP member States, indicated this during the Network’s annual meeting in 2021 as well as during information conversation help with the ESCAP Secretariat on digital FDI.
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. 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, benefitting 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 per cent expansion in mobile broadband penetration raises GDP by 2.44 per cent in developing Asia-Pacific countries (ITU 2020a) and by 2 per cent in middle-income and low-income economies overall (ITU, 2019a). Similarly, a 10 per extension in fixed broadband penetration can raise GDP by 1.63 per cent in developing Asia-Pacific, and by 0.5 per cent in middle-income and low-income economies (ITU, 2019a).

2.3. Examples of digital infrastructure foreign investors

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). 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.\(^{18}\) 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.\(^{19}\) 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, KT (Korea Telecom) is partnering with Vietnam Television to develop a Vietnamese music streaming platform,\(^{20}\) and Singtel has tied up with the Hyundai Motor Company to create IoT-enabled smart manufacturing and automotive solutions (GSMA, 2021b).

Table 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 they have undertaken in Asia and the Pacific.

### Illustrative examples of foreign direct investors in digital infrastructure

<table>
<thead>
<tr>
<th>Telecommunications networks/services</th>
<th>Data storage/processing</th>
<th>Connectivity devices and IT components</th>
<th>Digital infrastructure software</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ericsson (Sweden)</td>
<td>Equinix (United States of America)</td>
<td>Lenovo (China)</td>
<td>Cisco (United States of America)</td>
</tr>
<tr>
<td>Huawei Technologies (China)</td>
<td>Digital Realty (United States of America)</td>
<td>Oppo (China)</td>
<td>Apple (United States of America)</td>
</tr>
</tbody>
</table>

Source: fDi Markets.

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\(^{18}\) For more information, see https://www.huawei.com/en.


2.4. Digital infrastructure investor priorities

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 to attract investments by these firms and to maximize their contribution to digital economy development. Some of these factors were most recently confirmed in a survey of 310 of the globe’s leading technology firms, and are listed below in figure 5. Among the top priorities were: presence of a functioning modern licensing systems, availability of skilled engineers and local labour, the host country’s use of global digital infrastructure standards, collaboration with neighbours to develop regional connectivity and an open, liberal FDI regime. These, and some of the additional factors that investors consider as priorities, are discussed in further detail below.

- Licences: Licensing frameworks are critical to digital infrastructure investors (telecommunications firms, in particular). Licences dictate which types of firms can operate in a country, what type of services they can offer and, sometimes, what type of technology they can employ. Licences that are too restrictive impede investors’ ability to quickly respond to ongoing technological innovation and market changes.

![Figure 5: How important are the following regulatory elements for investing abroad in digital infrastructure?](image)


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22 Most countries still employ service-specific licensing (Broadband Commission, 2021), limiting licensees to one type of service.

23 For example, when mobile telephony first spread globally, many countries locked mobile operators into using either CDMA or GSMA technology.
Also, licences that rigidly bind investors to one service or technology preclude them from using their equipment and assets to develop and deliver related or completely novel offerings as well as seize new opportunities (Broadband Commission, 2021). A further challenge is delay and non-transparency in licence allocation. (Broadband Commission, 2021).

For example, until recently, most countries required telecommunications operators to obtain separate licences to provide voice telephony over land lines and over mobiles because different handsets and transmission networks were required for each. Similarly, they had to obtain a separate licence to provide Internet services since consumers required a desk top computer attached to a landline to link with them. Now digital connectivity enables voice and Internet (i.e., data) signal to be provided using the same infrastructure and connectivity devices. Had countries not liberalized their licensing frameworks to support this technological convergence as it evolved, they could not have benefitted from – and enabled the further development of – the digital economy.

- **Local skilled workers and visa facilitation:** Digital infrastructure requires more sophisticated skills than traditional telecommunications.\(^{24}\) Most importantly, it will require advanced software engineers and software-trained hardware engineers/technicians trained to successfully install, operate, maintain and repair increasingly intelligent and self-managed systems. Skilled data centre engineers will also be required to build, operate and maintain the expanding network of data centres and associated cloud-based computing, edge and quantum computing infrastructure.\(^{25}\) Should these skills not be locally available, prospective investors need to know that they can quickly and easily import them; in such cases, the presence of visa facilitation programmes is important.

- **Regional infrastructure coordination and international standards:** Countries that employ internationally agreed technical standards are considerably easier for digital infrastructure investors to operate in. Investors can roll out the same standardized equipment and services across markets, rather than having to spend time and money on customization. For this reason, Latin America has regionally harmonized the spectrum it allocates for mobile broadband, for example.\(^{26}\) Similarly, digital infrastructure investors prefer countries that coordinate infrastructure development regionally as it gives them immediate cross-border access a technologically harmonized bloc with a common infrastructure development plan. Such regionally developed digital infrastructure can also be co-deployed with the development of other types of regional infrastructure, such as transport (roads, bridges, trains etc.) infrastructure. Co-deployment of digital and transport infrastructure is already underway in several Central Asian economies with the support of ESCAP.

\(^{24}\) This paragraph is based on insights from two senior telecommunications sector executives interviewed for this Guidebook.


\(^{26}\) For more information, see https://www.gsma.com/latinamerica/latin-america-moves-towards-region-wide-allocation-of-digital-dividend-spectrum-for-mobile-on-a-harmonized-basis.
• Openness to FDI: Restrictive FDI regulations can hinder digital infrastructure investors looking to invest overseas. Several countries restrict foreign entry and ownership, and impose lengthy approval procedures on foreign firms. In China, for example, foreign firms cannot invest in Internet news, information dissemination and publishing, and they can only invest up to 50 per cent in basic telecommunications services.²⁷ India requires prior government approval for investors from countries with which it shares a land border.²⁸ Several countries, including Brunei Darussalam²⁹ and Malaysia,³⁰ prohibit or limit foreign participation in telecom company boards and in senior management. Other restrictions include limits on foreign ownership of land and on capital repatriation.³¹ In some countries, foreign data storage and processing firms are subject to restrictions on where and how they can store and use the data they generate. (UNCTAD 2019, Digital Economy Report).

• Access to infrastructure and shared assets: Since new digital infrastructure is costly, digital infrastructure firms, including Vodafone and Telefonica,³² and Bharti Airtel and Reliance Jio,³³ have begun to share infrastructure and equipment³⁴ to minimize costs. Infrastructure sharing can reduce construction and permit costs by up to 20 per cent (WEF, 2014), free-up capital for the development and rollout of new technologies such as 5G and IoT (GMSA, 2021a), and protect invaluable equipment from theft and damage (ITU, 2021e; Broadband Commission, 2021). Therefore, digital infrastructure firms seek out countries that permit such sharing³⁵ and that enable them to use public infrastructure (such, as electricity poles, railways, roads, and underground gas, water, sewage conduits) to mount transmitters/receivers and run broadband fibre (Broadband Commission, 2021).

• Spectrum rules: Since spectrum³⁶ is the core input for mobile data connectivity, digital infrastructure investors typically prefer host countries in which spectrum prices are reasonable, and fairly and efficiently allocated. Yet, many developing countries use spectrum auctions to raise public revenues – and their average reserve and spectrum prices are five and three times higher, respectively, than in developed countries (GSMA, 2018). High auction prices also undermine competition by advantaging

²⁸ For more information see https://egazette.nic.in/WriteReadData/2020/219107.pdf.
³¹ See https://telecoms.com/494888/vodafone-and-o2-uk-buddy-up-over-5g-infrastructure-sharing.
³⁴ ITU data shows that more than three-fourths of ESCAP members now permit or mandate such infrastructure sharing.
³⁵ See the relevant data in the ICT Regulatory Tracker. Available at https://app.gen5.digital/tracker/metrics.
³⁶ Spectrum refers to “the radio frequencies allocated to the mobile industry and other sectors for communication over the airwaves.” GSMA, What is Spectrum? Available at https://www.gsma.com/spectrum/what-is-spectrum.
bigger, richer firms (GSMA, 2018). Governmental delays in releasing additional spectrum and in reassigning obsolete spectrum\(^{37}\) for new applications are other major challenges to foreign direct investors (GSMA, 2018; ITU, 2021d and Broadband Commission, 2021). Not only does all this discourage investors, it also reduces the capital they could have employed for network expansion and upgradation, resulting in sub-optimal service quality and higher consumer prices. (GSMA, 2018; ITU 2021 and Broadband Commission).

- Regulatory framework for digital infrastructure: Foreign direct investors seek markets with an independent sector regulatory authority and an independent competition authority that protect the interests of all digital infrastructure investors equally (Broadband Commission, 2021). For the same reason, they tend to invest in markets that privatize government-owned telecom incumbents, as illustrated, for example, by the sudden growth of digital infrastructure FDI into Indonesia and Chile once the Government divested this sector.\(^{38}\)

- Taxes: Telecommunications operators pay a variety of taxes and fees in the developing world, including corporate tax, sales tax (even on initial network equipment purchases), value-added tax, property tax, taxes on interconnection revenues, taxes on digital connectivity devices, and duties on imported network equipment (ITU, 2021e; Broadband Commission, 2021; GSMA, 2019). Together, these can exceed 30 to 40 per cent of sector revenue and can strongly discourage prospective foreign direct investors (Broadband Commission, 2021).

- Universal service funds: In addition to all the taxes listed above, more than 100 countries (ITU, 2021d) – including the United States, the Russian Federation, India, Malaysia, Indonesia, Borneo, Brazil and Sudan (Broadband Commission, 2021) – require telecommunications operators to contribute between 1 per cent and 6 per cent of revenue (Broadband Commission, 2021) to a national Universal Access and Service Fund (UASFs) and to expand network connectivity to unserved/underserved populations as a condition for their licence.\(^{39}\) However, USAFs have not functioned as intended, creating unnecessary costs and challenges for operators, because of widespread calls for reform or closure (Broadband Commission, 2021; GSMA, 2016; ESCAP, 2017; ITU, 2021d). In most countries, only telecommunications operators are subject to USAF levies, although monies are used to support other digital infrastructure players, including digital platforms and data centres. (ITU, 2021d). Another key challenge is that USAFs often do not disburse monies on time or in the correct quantity, and that “more than half of the sums collected for USAFs were never utilized” (Broadband Commission, 2021) or spent in non-ICT sectors (ESCAP, 2017; ITU, 2021d). Operators are also compelled to create infrastructure in geographically challenging terrain or where equipment theft is a problem as well as grapple

\(^{37}\) As mobile connectivity upgrades, individual operators no longer require legacy spectrum (e.g., for 2G and 3G) as they move into 4G and 5G.


\(^{39}\) Operators then bid for UASF subsidies to help meet their committed network/service expansion targets (ESCAP, 2017).
with poor local government capacity, and deal with the market distortions arising from UASF levies on some digital infrastructure operators and not others (ESCAP, 2017).

2.5. Conclusion

FDI can help countries in their endeavours to build and upgrade the digital infrastructure required for an inclusive digital economy. This chapter has underlined the fact that to attract FDI into digital infrastructure, investment policy makers and IPAs must first address issues related to licences, local digital infrastructure and software skills, efficient spectrum allocation, infrastructure sharing, openness to FDI, independent sector and competition regulation, use of international technical standards and regional infrastructure coordination. For data centre investors, stable, uninterrupted and cheap electricity is of the essence. To attract digital infrastructure investors, host countries will need to put these essential elements into place.

IPAs will also need to pro-actively reach out to investors, with the types of information they will need to feel confident about investing in a new overseas location, as explained in chapter 5 of this guidebook. At the same time, IPAs will need to support investors through the investment process and continue to systematically engage with them, even once projects are operating, to ensure continued investment and expansion by them. How they might do this is also explained in chapter 5.
CHAPTER 3

FDI to support local business digitalization

3.1. How can FDI support digitalization of traditional ‘brick and mortar’ firms?

Globally ‘brick-and-mortar’ firms with overseas investments have been adopting digital technology in their home and host countries to enhance efficiency, cut costs and boost international competitiveness for the past two decades (McKinsey, 2018). These firms have begun digitalizing aspects of their work in response to certain industry-specific challenges. They are different from purely digital businesses (chapter 4) because they have not historically used the Internet to market to, and take online orders from customers, to manage product delivery and post-sales customer services, and to strategically partner with an external ecosystem to create economic value (HBR, 2021).

Within the Asia-Pacific region, a growing number of firms are looking to digitalize. A recent survey of 800 businesses in the region indicated
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that 92 per cent of them were in the process of re-evaluating their digital strategies and digital infrastructure to remain competitive (Baker McKenzie, 2021). A total of 79 per cent classify themselves as ‘digital laggards’ rather than digital leaders in their industries, highlighting that many businesses need to catch up to their competitors to capture growth opportunities. FDI can play an important role in supporting the digitalization of Asian and Pacific firms in this context. This is especially true for firms that are integrated into global supply chains. Value chain-linked FDI can help investee firms to digitally upgrade their operations and, thus improve the efficiency of the value chain itself.

This type of FDI is an attractive option for developing countries with a basic level of digital infrastructure, but which are not yet in position to attract major investments from digital businesses (chapter 4). Such FDI supports local firms in adopting digital technology, triggering spill-over effects that generate a momentum towards economy-wide digital adoption. Expanding digital adoption will, in turn, attract more FDI from purely digital businesses (chapter 4) and drive the growth of local digital businesses.

3.2. What type of digital adoption can FDI support?

FDI 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 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.

(a) 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 expensive hardware and software investments. 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 the firm to avoid buying expensive servers and software packages, and hiring dedicated IT staff to operate systems and upgrade software.

(b) Industry 4.0 technologies – Manufacturing firms are adopting and investing overseas in Industry 4.0 (or ‘smart manufacturing’) digital

41 Digitalization can affect any process in the supply chain, including procurement, production, coordination across networks of operating units, outbound logistics and customer relations (UNCTAD, 2021c).
42 The Public Cloud includes such offerings as ‘software-as-a-service’ (SaaS), ‘infrastructure-as-a-service’ (IaaS) and ‘cloud business process services’ (BPaaS). For more information, see https://azure.microsoft.com/en-in/overview/what-is-a-public-cloud.
technologies\textsuperscript{43} that enable them to remotely automate, control and optimize and observe production and supply chain operations in real time (box 1).\textsuperscript{44} 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.

**Box 1**

**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 over two months to a couple of days.\textsuperscript{45} These Speed factories are examples of Greenfield FDI investments in each of these countries. In them, international digital connectivity and 3D printing enables Adidas to engage internationally with customers 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. 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.\textsuperscript{46} 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: Adapted from Quartz. Adidas: A German company built a “Speed factory” to produce sneakers in the most efficient way. Available at https://classic.qz.com/perfect-company-2/1145012/a-german-company-built-a-speedfactory-to-produce-sneakers-in-the-most-efficient-way/*

\textsuperscript{43} According to IDC, 75 per cent of large manufacturers already use such technologies. Please see https://oroinc.com/b2b-ecommerce/blog/digital-transformation-in-manufacturing-case-studies.

\textsuperscript{44} IDC estimates that global firms will spend US$7.4 trillion on digital transformation in 2023, most of it on manufacturing. See https://oroinc.com/b2b-ecommerce/blog/digital-transformation-in-manufacturing-case-studies.


\textsuperscript{46} See https://qz.com/1112641/nike-is-racing-adidas-to-speed-up-sneaker-manufacturing/.
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 investing in this equipment in their manufacturing investments in host countries in order to enable more effective manufacturing of products 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, 2021b). 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 a 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.

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.

(c) Big Data and analytics – Big Data analytics allows the simultaneous processing of huge streams of variegated information and enables sending out of automated commands in real-time. Firms that 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. A recent survey of global executives highlighted that at least half believe data and analytics has fundamentally shifted the nature of competition in their industries (McKinsey, 2019). The same executives noted that competition is being driven both by new entrants and traditional competitors launching analytics-based businesses, and traditional competitors launching new products that include analytics services (McKinsey, 2019).

Big Data and analytics have the potential to change and optimize value chain linked FDI (box 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 it 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 encourages them to form data-related partnerships along the value chain (box 2).

**Box 2 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 has built overseas through Greenfield FDI.

Using tens of thousands of satellite images of local deforestation, geolocation 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 it can stop sourcing from there or invest in reforestation. Since this technology is now being applied in other products in other parts of the world, Big Data and AI can thus also help foreign direct investment become more sustainable.


Big Data and data analytics also have the potential to lead to changes in volumes of FDI, as well as in transfers of managerial skill sets that often may be associated as a spill-over effect of FDI. For example, if automated commands can be sent from headquarters, then less investment needs to be made in large corporate management structures that oversee all activities. This would not only decrease the volume of FDI flows by reducing the investment that goes into building that corporate structure, but may also jeopardize the extent of managerial spill-over effects.

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.

(d) 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, 2020). 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.49 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.

3.2.1. What does digital adoption mean for value-chain linked FDI in host countries?

As businesses variously integrate the four technologies outlined above into their global value chains, they have the potential to fundamentally reconfigure supplier and distribution relations, the way in which businesses are conducted within such chains and, consequently, the flow of FDI into host countries (UNCTAD, 2020; UNIDO, 2020). For example, e-auctions may lead to broader supplier relationships, but complex requirements might encourage closer and more exclusive supplier partnerships to arise between lead firms and suppliers.

Since high-quality digital connectivity, advanced robotics and AI enable the remote control of production, even from thousands of miles away, lead firms in value chains may gradually transition to an international network of decentralized ‘smart’ production units digitally controlled by a handful of computers and highly skilled employees at headquarters and field locations. (UNIDO, 2020; UNCTAD, 2020). For this reason, digital adoption across the value chain may create new high-skilled jobs in developing countries. However, it may also create less jobs that require low-skill levels, especially in the manufacturing sector, which averages around 40 per cent of all Greenfield FDI in Asia and the Pacific (ESCAP, 2021).

FDI in digital adoption might enable firms that have already adopted digital technologies to more effectively integrate and upgrade themselves into value chains. For this to happen, host country policymakers across line ministries must ensure that their economies are digitally competitive for, and able to absorb such FDI. This means that digital infrastructure and a digitally skilled workforce must be in place, together with businesses

that have already adopted or are prepared to adopt digital technology.

3.2. Who are the investors?

With traditional brick-and-mortar firms adopting digital technologies in different aspects of the supply chain to optimize supply, production and distribution, the range of potential investors from the ‘digitalizing business’ category can span all sectors and includes many of the firms with which host countries are already familiar. As IPAs in host countries work to develop FDI strategies to boost FDI into digital adoption, it is important that they understand the type of firms that undertake these investments. Understanding the types of firms that are making such investments and examining those investments will help IPAs develop both investment leads and local value proposition for potential investors.50

Table 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 identifies national development needs and priority sectors in the digital economy, the level of digital infrastructure and digital competitiveness in their economy, the extent of digital adoption by local businesses, and where target investors could make the largest potential contribution to furthering digital adoption and wider digitalization in the economy.

Table 2

<table>
<thead>
<tr>
<th>Firm name</th>
<th>Sector, home economy</th>
<th>Investment</th>
</tr>
</thead>
<tbody>
<tr>
<td>BHP Group</td>
<td>Mining, Australia</td>
<td>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).</td>
</tr>
<tr>
<td>BMW</td>
<td>Automotive, Germany</td>
<td>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).</td>
</tr>
<tr>
<td>Adidas</td>
<td>Textiles, Germany</td>
<td>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).</td>
</tr>
</tbody>
</table>

50 For more information on the work of IPAs related to FDI strategy and local value proposition development as well as the lead generation processes please refer to Part III of the ESCAP (2022) Handbook on Policies, Promotion and Facilitation of Sustainable FDI.
3.3. Digital adoption and digitalization investor priorities

In addition to the more traditional factors that affect a company’s decision to invest in a particular location, businesses that undertake investments that support digital adoption of local firms and wider digitalization in the local economy look to several other factors specific to the digital economy. Each of these factors are outlined below, noting that several of the factors that are important for investors investing in digital adoption are also important for digital business investors (chapter 4). The information outlined below has been collected through interviews with FDI investors in the digital economy and IPAs in Asia and the Pacific as well as through desk research and secondary data collection. IPAs need to understand these factors and incorporate them into their local value propositions that they pitch to potential investors for FDI into digital adoption.

- High-quality international and national digital connectivity and computing. This is an essential prerequisite for firms running globally connected operations in which 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. Adidas or Unilever, for instance, would be unable to run smart factory (box 1) or geo-tracking (box 2) initiatives in countries that do not have adequate connectivity and data computing ability.

- 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. In digitally managed factories, for example, every phase of the production process (storeroom management, the movement of inputs to the factory floor and through production, and transport of the final product to factory gate) is automated, but requires specialized human supervision. In these factories, workers need basic

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52 For example, both types of investors, i.e., digital adoption and digital business investors, will be concerned with the level of digital infrastructure, level of digital skills and the tech and innovation eco-system.
53 For the complete list of interviewees, see the Acknowledgements in this Guidebook.
training in electronics, software, and operations, in addition to mechanics. Post-sales maintenance and customer services teams also require similar skills, as gradually everything – from a washing machine to a railway train – is likely run on digitally-enabled software. The more that traditional foreign direct investors use digital technology and data analytics to compete, the more they will need digitally skilled technicians even at the lowest rung of the labour market – to run the robots, chatbots and intelligent machines that every business activity will progressively use.\textsuperscript{55}

Foreign direct investors investing in digital adoption will also progressively prioritize local talent that combines detailed sector knowledge with Big Data and artificial intelligence skills. For example, agriculture investors will look for combined expertise in crop production/water management and digital applications that enhance crop yield or irrigation efficiency.\textsuperscript{56} Sectors as diverse as mining and fisheries to health, education, and business services will experience a similar trend.

- Tech and start-up ecosystem. Like digital business, investors looking at projects to support digital adoption may also vet local tech ecosystems when considering investment locations. This is because 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.”\textsuperscript{57} As of now, they do not have the requisite experience or the speed to market of more digitalized competitors (KPMG, 2015a). To outdo rivals and remain globally competitive, such firms are finding it increasingly valuable to strategically partner with (or acquire) local digital start-ups with pioneering technologies and business models.\textsuperscript{58} Many foreign direct investors are now creating their own international in-house “portfolios of innovation start-ups.”\textsuperscript{59} For example, BMW’s Startup Garage\textsuperscript{60} offers start-ups the opportunity to work with it as a “venture client” on an innovation project after screening them for technical quality, strategic fit and the potential to become a market leader through a stage-gate process. Other firms with similar ventures include Bayer, Swiss Re, SAP and Unilever.\textsuperscript{61}

- Robust regulatory framework for the digital economy. The more that 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 digital business (see chapter 4, section 4.3). They, too, will need laws that protect their data, intellectual property, and contracts that enable and recognize digital I.D.s, digital payments and e-commerce. At the same time, they will also become responsible for protecting the privacy and security of customer data.


\textsuperscript{59} See https://www.zdnet.com/article/conglomerates-are-dead-but-tech-giants-are-conglomerates-in-training.

\textsuperscript{60} See https://hbr.org/2017/07/what-bmws-corporate-vc-offers-that-regular-investors-cant.

\textsuperscript{61} See https://hbr.org/2019/01/the-two-ways-for-startups-and-corporations-to-partner.
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3.4. Conclusion

This chapter has outlined how FDI can support digital adoption of businesses in a local economy, how such FDI is important for value-chain linked FDI, the types of investors that undertake investments to support digital adoption, and the factors that must be present in the host country for an investor to consider a location for a particular investment. It also briefly highlights why regulatory frameworks around data security and privacy suddenly become important for firms adopting digital technologies as a fundamental aspect of their offering to consumers.

Source: Author interview with Sino Group.

Box 3

Why data security and privacy become important to firms adopting digital technologies

Sino Group is a leading Hong Kong, China property developer with residential, office, industrial and retail projects and properties in China; Hong Kong, China; Singapore; and, Australia.62 It is both actively digitalizing its business and working with tech partners who are creating digital applications they can sell to the global real estate market. For example, it has been exploring digital applications in market that provides experience for shopping malls that can automatically send targeted advertising to VIP shoppers. It could enable an enhanced experience for one of these shoppers that enters the mall, for the VIP’s presence to automatically alert its backend. This backend then automatically tracks each VIP shoppers’ movement through the mall and posts a stream of relevant advertising on each VIP shopper’s smart phone and on the electronic advertising screens they are approaching. A golfer, for instance, would receive messages about a golf equipment or golf-related clothing shop a few steps ahead, and a lady with an interest in jewelry about discount sales on pearls and gold that day.

All these are of course subject to strict compliance with relevant data privacy regulations and local laws. As a result of customer-focused, data-based applications such as this, Sino Group amongst many local leading developers, must now carefully study and comply with local regulations on data security and privacy, in addition to customary compliances with construction, environment and safety-related laws and permits. Such applications also require far more sophisticated employee skills and technological backends than the digital Building Information Managements systems many real estate firms now employ to design, construct, operate, and environmentally optimize their properties. Leading amongst these are the need for a highly skilled data and cyber security team and for robust firewalls that limit access to the personal data being collected.

Source: Author interview with Sino Group.

FDI from digital businesses

4.1. What is 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.63 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.

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63 For more information, see Forbes, Top 100 Digital Companies. Available at https://www.forbes.com/top-digital-companies/list/#tab:rank.
1. Digital production and delivery – Since digital businesses sell to and serve consumers online, they can simultaneously and instantaneously serve billions of consumers globally. Firms with completely digital offerings, such as Facebook and Netflix, can operate from anywhere (UNCTAD, 2017). All they need is high-quality international digital connectivity and a digitally connected and digitally literate host country population (Satyanand, P.N., 2021). Therefore, to attract FDI from a digital business, good digital infrastructure is a must.

2. Asset and employment lightness – Digital businesses tend to be more asset and employment ‘light’ than traditional businesses, because they can digitally produce and deliver their products (UNCTAD, 2017). They do not need to invest and employ as much overseas as traditional businesses to generate the same unit of foreign revenue. Firms that sell purely digital products and services have an average ratio of foreign sales to foreign assets of more than two and a half times greater than that for all other firms (UNCTAD, 2022). This is money which can then be used to rapidly scale up globally (UNCTAD, 2017). This means that the volume of FDI from digital FDI may be much smaller than more traditional Greenfield investments in physical assets.

3. Platforms and networks – Digital businesses are asset and employment light because they use Internet-enabled digital platforms to create local networks to produce and deliver products and services to consumers (UNCTAD, 2017). Platform creators, such as Airbnb and Uber, use their online platforms to connect potential sellers/service providers with potential customers, and earn a fee from each transaction. Airbnb does not invest in building rooms across the world to serve foreign markets, nor does Uber invest in its own local cars and drivers to provide rides to customers. They merely organize local networks of homeowners and car drivers to make rooms and taxi rides available to customers using their platforms. These networks are also important sources of employment in the countries where digital businesses invest (ADB, 2021). Despite operating fundamentally differently, these firms still undertake FDI activities in host economies. For example, Singapore-based Grab acquired all of Uber’s South-East Asian operations in 2018, and in 2020 Grab merged with Indonesian-based Gojek in 2020.

4. Cross-sector operations – Successful digital businesses looking to expand are often able to rapidly scale up by harnessing digital technology to seize opportunities across industries (UNCTAD, 2017; ASEAN, 2018). Digital technologies give digital businesses the flexibility to enter a new sector or a new country, by reducing barriers to entry that many ‘brick-and-mortar firms’ face. For example, they are able to win customers away by, for the first time, giving them the convenience of shopping (or ordering services) online without having to invest in traditional shopping infrastructure (such as shops, inventory and staff). Amazon, for example, began by selling books online and then used the same technology to grow to a global scale by expanding into selling household items, groceries films and cloud computing internationally, for which it needed to invest overseas in opening logistics hubs in host economies. In many cases, digital businesses acquire incumbent firms to cross into other sectors and quickly build market shares. For example, in 2022, Singaporean

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64 For more information, see https://www.forbes.com/sites/briansolomon/2016/05/03/how-airbnb-expanded-to-190-countries-by-thinking-glocal/?sh=5ee678e37e91.
65 For more information, see https://thestartupfactory.tech/from-startup-to-scaleup-lessons-from-uber/.
66 For more information, see Podean, A Brief History of Amazon. Available at https://www.podean.com/a-brief-history-of-amazon.
Grab acquired a major stake in Malaysian supermarket chain Jaya-Grocer. This investment enables Grab to offer on-demand delivery to users of Jaya-Grocer products in Malaysia.\(^{67}\)

The previous two factors illustrate another feature of FDI from digital businesses that tends to differ from FDI into digital infrastructure and FDI into digital adoption. This is that many digital businesses tend to use mergers and acquisitions when they first enter a country, and the purpose of such investments is to improve their value proposition to customers.\(^{68}\) Such investments are more complex than Greenfield investments, and the legislative environment governing business environments in host economies play an even more influential role in determining the attractiveness of host countries for such transactions (Ciobanu, 2015). In other words, digital infrastructure, a digitally skilled workforce, and an enabling legislative and business environment for development and capital gains are important for digital business foreign investors when going engaging in cross-border investing.

4.2. How can host countries benefit from FDI from digital businesses?

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\(^{69}\) 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.

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\(^{70}\) 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.

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\(^{68}\) As opposed to using digital technology to improve how a product is made or to incorporating digital technology into products to improve user experience. Both of these motivations resonate with business using M&As to adopt technologies.

\(^{69}\) For more information, see: https://indianexpress.com/article/explained/what-the-jio-deal-means-for-reliance-facebook-6374686/.

\(^{70}\) For more information, see https://www.livemint.com/Companies/m5QBrhaa7Ng iyVqe7uSnK/Indonesian-bikehailing-app-GoJek-buys-LeftShift-Technology.html).
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.71

4.3. Who are the digital business investors?

There are two broad types of digital business firms engaging in FDI: (a) purely digital firms and (b) mixed digital firms. IPAs need to understand both types of firms when undertaking investment promotion activities to boost FDI from digital businesses.

(a) Purely digital firms. This type of firm offers completely virtual products and services to customers, including Internet platforms such as search engines (Google), social networks (Linked In), social media and media-sharing applications (Facebook), online knowledge repositories (Coursera) and platforms that enable people to collaborate virtually (UNCTAD, 2017). They also offer Internet-delivered digital services and solutions, such as electronic and digital payment methods (Google Pay and WeChat), online computing (SaaS), web hosting and email services (Microsoft Outlook), and digital solutions for business management and financial applications. Several digital firms have invested overseas to open subsidiaries in Asia and the Pacific, or through partnerships. Google, for example, has a Thailand subsidiary, and Creamfinance (Cyprus) has partnered with Mintos to expand online lending platforms available in Georgia.

(b) Mixed digital firms. This type of firm uses the Internet to sell physical products to consumers, and/or to service customers through a combination of virtual and physical offerings (UNCTAD, 2017). They comprise e-commerce and digital content platforms, including online retailers, ride-hailing services, e-stores, travel agencies, and marketing and advertising agencies (UNCTAD, 2017). Asian examples include Alibabas, Grab and Gojek among others.

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’s 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 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. This will help them to more effectively identify target investors going forward.

Table 3 therefore provides illustrative examples of purely digital and mixed digital firms and their recent investments in the Asia-Pacific region.

### Table 3

<table>
<thead>
<tr>
<th>Purely digital firms</th>
<th>Internet platforms</th>
<th>Digital solutions</th>
<th>Mixed digital firms</th>
<th>E-commerce</th>
<th>Digital content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meta (Facebook)</td>
<td></td>
<td></td>
<td>Amazon (United States of America)</td>
<td></td>
<td>Netflix (United States of America)</td>
</tr>
<tr>
<td>(United States of America) opened a training centre in India to support local small business owners, creators, entrepreneurs and communities (2021).</td>
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<tr>
<td>LinkedIn (United States of America)</td>
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<td>invested S$ 80 million to open a new data centre in Jurong, Singapore (2016).</td>
<td></td>
<td>Automatic Data Processing (United States of America)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>doubled the size of its operations in Makati, the Philippines (2013).</td>
<td></td>
<td></td>
<td>Amazon (United States of America) opened a last-mile delivery station in Tokyo, Japan to better serve the domestic market (July 2021).</td>
</tr>
<tr>
<td>Cisco (United States of America)</td>
<td></td>
<td></td>
<td>aCommerce (Thailand)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(United States of America) 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).</td>
<td></td>
<td>expanded its operations in Taguig, the Philippines (2018).</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thomson Reuters (Canada)</td>
<td></td>
<td></td>
<td>Thomson Reuters (Canada) opened a new subsidiary in Shenzhen, China to serve the Asia-Pacific market (2018).</td>
<td></td>
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</tr>
</tbody>
</table>

Source: Adapted from Satyanand, P.N. 2021 and fDi Markets.
4.4. Digital business investor priorities

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, and a stable and holistic regulatory framework for the digital economy are the most important host country location factors driving digital businesses’ investment decisions (Stephenson, 2020). Figure 6 highlights the key location factors identified by 310 of the world’s largest digital business investors (Stephenson, 2020).

A brief description of the importance of several of these factors from an investor’s perspective is provided below.

- High-quality international and national connectivity. Since digital businesses depend on the Internet for their operations and distributions, high-quality Internet, digital connectivity and supporting infrastructure (figure 6, blue bars) are understandably their most dominant concern.
- Digital skills. In order to be able to work with the digital technologies driving digital businesses, workers will need to possess the required digital skills. Digital skills (figure 6, red bar) are therefore a principal factor of production for digital businesses.
• Venture capital and the presence of clusters/incubators. Digital foreign direct investors prefer locations that offer vibrant ecosystems of venture capital and technology clusters/incubators housing innovative digital start-ups (figure 6, yellow bars). In such ‘tech ecosystems,’ innovative digital start-ups can access technology, mentoring and investment that they might otherwise not come by, while working with visionary financiers who can grow them into internationally significant businesses (KPMG, 2015a). Similarly, a local concentration of flourishing start-ups provides larger businesses with the opportunity to partner with digital economy innovators whose new technologies could put them significantly ahead of competitors (KPMG, 2015b).

• Stable and enabling regulatory framework. Well-designed policy and regulation are important host-country features, both for traditional FDI firms as well as digital businesses. However, there are certain regulatory factors that are most important to investors. These include policies and rules that create terms for, as well as protect and support, digital business’ investments in a host location; and the policies and rules that create a well-functioning market for digital business’ products/services locally and protect local consumers. For this reason, regulations that rank as highest importance to digital businesses include: rules that protect data and intellectual property; those that protect consumers; those that protect and enforce digital business’ local contracts; and those that recognize and protect digital businesses’ novel operational models (Stephenson, 2020). Since many digital firms (such as e-commerce, online lending, and online gaming firms) must obtain licences to operate, host country licensing frameworks and their receptivity to new business models is another primary consideration. Regulations that potentially restrict businesses operational freedom in a host country, including those on cross-border data flows, data localization, source code disclosure, third-party content monitoring, online content, and access to foreign websites are most deterring to foreign investors (Stephenson, 2020).

• Fiscal and financial incentives and other government support. Fiscal and financial incentives, and government support programmes, appear less important to digital businesses when considering prospective investment locations. Since fiscal incentives are one of the most widely used measures to attract FDI, policymakers should note that these might not significantly influence investors’ decision to locate in a host country if they consider the four other factors listed above to be inadequate.

To better understand digital business investor needs in Asia and the Pacific, and to follow up the survey conducted by Stephenson (2020), ESCAP held consultations with digital business investors, venture capital firms, accelerators, global investment advisors and investment promotion agencies operating in the region. The principal findings from these consultations (figure 7) echo those of the global survey (Stephenson, 2020). Stakeholders pointed to the ease of doing business (i.e., the regulatory framework) and digital skills as their principal criteria when

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72 These rules are given in descending order of importance flagged by 300 digital business investors surveyed in Stephenson, 2020.
73 For the complete list of interviewees, see the Acknowledgements at the beginning of this Guidebook.
Choosing a host location in developing Asia and the Pacific. More than two-thirds of them also pointed to the ease of capital inflows and outflows as a major consideration.

Respondents also pointed to the importance of approaching potential investors with a clear and unique value proposition, and in a structured context, as explained in chapter 5.

These issues in the context of the Asia-Pacific region are further outlined below.

- **Ease of doing business** – Operational impediments (figure 7, blue bars) can dissuade foreign direct investors from locating in countries with otherwise attractive regulatory frameworks. Stakeholders flagged that Asia-Pacific host economies should prioritize streamlining and easing the administrative burden in three areas:

  - **Company registration**. Company registration can take up to four months in some Asian economies. For example, a fashion technology and commerce company interviewed by ESCAP indicated that, company registration took 10 days in the United States and seven days in Singapore, versus three months in India;

  - **Opening a bank account**. Complex Know Your Customer (KYC) requirements, such as the need for a variety of physical documents from the customer and their verification, can cause delays in opening bank accounts in some Asian host locations. Instead, countries might look into e-KYC, where banks are able to facilitate and take onboard new customers quickly without signing
a large number of documents, but can still keep control and do the due diligence digitally;

- Licences. In some Asia-Pacific economies, it can take three to six months to obtain an operating licence for a digital business. A related challenge is that many Asian host economies require individual licences for each activity that a digital business undertakes, even if they relate closely to each other.74 This poses two problems. First, restrictive licences hinder firms’ ability to quickly respond to shifts in the competitive environment or to easily move into related activities for which they are not yet licensed. Second, it compels them to needlessly establish multiple subsidiaries in the same country, each with its own separate operating licence.

Singapore’s ease of doing business, regulatory frameworks, physical and digital infrastructure, and business-friendly environment, have all contributed to that country’s popularity as a launchpad for global firms and start-ups looking to expand in the region. Compared to its counterparts in the region, company registration in Singapore can take just over a day, opening a bank account takes only a few hours, and much of the process is digital. Licences can also be obtained within 10 days to two weeks, and cover a variety of similar or interlinked activities.2 Largely for this reason, the United Kingdom-based fintech start-up Wise (formerly TransferWise) chose Singapore as its Asia headquarters because of its status as a global hub for digital innovation, the ease of doing business, access to a diverse talent pool and a regulator that focuses on and understands fintech.3

- Cross-border working capital/venture capital inflows – Stakeholders flagged the fact that the globally-connected, collaborative businesses which characterize the digital economy require a continual flow of ‘working capital’ across borders. First, digital businesses rely fundamentally on a global network of digital talent contracted to undertake and deliver specific online tasks from wherever they are in the world. For this reason, digital businesses must continually remit money overseas to pay contractors as they deliver on key aspects of their work, often on a daily or weekly basis. Second, international investors can be crucial sources of funds to help create and develop local digital firms. A growing number of specialized venture capital funds, private equity funds and global digital firms have been investing in the development of local digital firms in developing countries (UNCTAD, 2021). A key requirement for FDI from and to digital business are financial regulations and requirements that are easy to fulfil to ensure timely payment of salaries and investment funds. At the same time, development of adequate payment platforms that can expedite cross-border payments can also prove helpful in creating a good FDI-friendly environment. However, in developing Asian economies, there are burdensome approval and reporting requirements that render such cross-

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74 To illustrate this point, an interviewee cited trading and lending. Hitherto, they were completely independent businesses, but digitalization now technologically enables them to be operated as one, should the licence permit it.
border transfers an administrative challenge, and cause unnecessary delays in operations in a globally hyper-competitive environment.

- Physical infrastructure – High-quality physical infrastructure is essential for e-commerce firms, for whom the competitive pressure to fulfil orders as quickly as possible is intensifying. Regardless of whether the order is domestic or international, firms struggle to outdo each other by delivering the same day, or within a few days at most. In China, for example, e-commerce firms are now pushing to fulfil international orders within one to two days of the consumer placing the order75 and, in India, a new breed of ‘quick commerce’ firms is committing to deliver groceries within 10 minutes of the order being placed online.76 Asia-Pacific countries seeking to boost FDI in an export-oriented e-commerce activity need to focus on building both the necessary physical and digital infrastructure. This is a particularly important point for IPAs to consider, as targeting and promoting FDI into such infrastructure could support attracting more FDI from and to digital business in the future.

- Interoperability across national customs, logistics and e-payment systems – E-commerce firms with operations in Asia cite the lack of interoperability between some national customs, and logistics systems are a challenge. Ongoing advances in technology and international interoperability have now made global ordering and payments smooth, but product shipments often get delayed at international borders. This is because the underlying customs and logistics systems are still not fully integrated across countries, so in many countries the relevant paperwork must still be done physically. An added challenge is that countries currently use different trade classification systems to categorize products and services that they trade.77 As a result, neither firms nor Governments have an internationally unified, end-to-end real-time dashboard for each online order as it moves across countries to the end-consumer. For digital businesses, especially e-commerce firms, where delivery times can make a difference to market share and success, investing in host countries with interoperable customs data systems is more attractive. To this end, participation in initiatives such as the Framework Agreement on the Facilitation of Cross-border Paperless Trade in Asia and the Pacific could simplify cross-border paperless trade while also boosting associated FDI.

- Digital skills – Stakeholders emphasized that in addition to high-level IT hardware and software skills, foreign investors in digital businesses prioritize creative skills in host economies. This is because digital businesses and their clients are increasingly employing visuals, rather than text, to communicate with

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76 For more information, see ChannelSight, *The Rise of Quick Commerce in 2022*. Available at https://www.channelsight.com/blog/quick-commerce.

77 For more information, see https://mag.wcoomd.org/magazine/wco-news-87/why-governments-and-customs-continue-to-need-their-own-classification-system-for-goods/.
consumers. Creative skills are also key to successful augmented reality, virtual reality and animation applications. To this end, for example, Meta (Facebook) is investing in a training centre in India to support small business owners, entrepreneurs and creators with a focus on virtual reality and augmented reality training. In addition, companies delivering or using cloud solutions will need talent that can develop new shared technologies online, rather than offline on privately-owned hardware. Digital businesses will also progressively prioritize skills that combine detailed sector knowledge, and fluency with Big Data and artificial intelligence, to create and deliver digital applications across sectors targeted towards the local audience.

4.5. Conclusion

This chapter provides a foundational understanding of digital business FDI, by explaining what digital businesses are, how they invest across borders, and the benefits that host countries can gain from such FDI. It also presents examples of digital business investors and outlines the priorities of digital business investors when choosing a location for their investments. Investment policymakers and IPAs can use this knowledge to create strategic policies and strategies to build on their economies’ core strengths, and attract FDI from and into digital businesses. Against this background, the following chapter of this guidebook provides specific recommendations, both for policymakers and IPAs, for harnessing FDI to and from digital businesses.

CHAPTER 5

Attracting, promoting and facilitating digital FDI

5.1. Introduction

Foreign direct investors in the digital economy can help host economies cultivate their digital environments. FDI into 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.
Before undertaking the appropriate policy actions and IPA activities to bring in investors, countries should carry out a needs and 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 developing 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. 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 Chang Mai, where digital infrastructure is already very good 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 data centres, and in digital businesses.

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5.2. Policy recommendations and investment promotion and facilitation measures to attract, promote and facilitate digital FDI

Investment policymakers and investment promotion agencies can undertake various actions and policy measures to promote and facilitate digital FDI better in each of these areas. Certain actions and measures are specific to each type of digital FDI, while some are broadly relevant for all three areas. Table 4 provides a summary of all policy recommendations for each digital economy area, and table 5 provides an overview of the actions that IPAs should take. Note that policy measures differ for each digital economy area, while actions for IPAs to undertake can be broadly categorized for each area. Therefore, the following four sections are structured along these lines – the first three subsections provide an in-depth discussion of policy recommendations for investment and ICT policymakers, while subsection 4 provides a discussion of the actions that IPAs should take. The final section concludes the chapter with measures that are recommended in the following subsections.

Table 4
Policy recommendations for investment and ICT policymakers to attract digital FDI

<table>
<thead>
<tr>
<th>Digital infrastructure</th>
<th>Digital adoption</th>
<th>Digital businesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liberalize rules/regulations on FDI digital infrastructure.</td>
<td>Offer appropriately balanced fiscal and financial incentives.</td>
<td>Build digital skills through building partnerships with businesses.</td>
</tr>
<tr>
<td>Implement targeted enhancements in the regulatory regime.</td>
<td>Create an enabling framework for FDI by helping business to digitalize; and encouraging partnerships between the public sector and businesses to build digital skills.</td>
<td>Enhancing the regulatory framework for FDI in digital business.</td>
</tr>
<tr>
<td>Create a detailed national broadband plan</td>
<td>Digitalize industrial parks and SEZs.</td>
<td>Liberalize the rules on FDI in digital businesses.</td>
</tr>
<tr>
<td>Develop a policy framework for data center development</td>
<td>Test regulatory attractiveness to foreign investors.</td>
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</tr>
<tr>
<td>Reform Universal Service Funds</td>
<td>Liberalize the rules on cross-border working and venture capital flows and enhancing the ease of doing business.</td>
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</tr>
<tr>
<td>Lighten the fiscal and financial burden on digital infrastructure</td>
<td>Improve physical connectivity in the host country.</td>
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<tr>
<td></td>
<td>Ensure interoperability of national customs and logistics system.</td>
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<td></td>
<td>Offer appropriately balanced fiscal and financial incentives.</td>
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</table>
CHAPTER 5  ATTRACTING, PROMOTING AND FACILITATING DIGITAL FDI

5.2.1. Investment policy recommendations for attracting FDI in digital infrastructure

To boost FDI in digital infrastructure, host Governments will need to work simultaneously on three fronts, each as important as the other. First is to revisit and liberalize FDI rules for digital infrastructure. Second is to fashion a modern regulatory framework and create a smooth operating environment for the digital infrastructure sector overall. Third is to reduce the fiscal and financial burden on digital infrastructure investors. Each of these is discussed in greater detail below.

(a) Liberalize rules/regulation on digital infrastructure FDI

To attract more FDI, countries should start with the simple step of ensuring that each digital infrastructure subsector is open to foreign participation, including domestic and international fixed line services, domestic and international mobile telecommunications services (3G, 4G, 5G etc.), cable modem, DSL, fixed wireless broadband, and leased lines. In Asia, for example, Australia, Japan, Singapore, India and Pakistan now permit foreign participation and full competition in all these segments. Similarly, foreign

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 business 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 IPA website and on other notice platforms (for example, digital conference platforms, the SDG investment platform etc.). |
| Engage in networking opportunities, facilitate partnerships and collaborations 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. |

80 Ibid.
participation and full competition should also be permitted in Internet exchange points and data storage/processing operations.

FDI opening in just one of these segments (i.e., mobile telecommunications services) is associated with a 14 per cent rise in national annual capital investment in mobile broadband by foreign and domestic firms combined (figure 9)\(^\text{81}\) (ITU, 2021e). It is also associated with a 13 per cent expansion in national mobile coverage (figure 9) and an 8 per cent drop in telecom sector prices (figure 10) (ITU, 2021e).

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\(^\text{81}\) These figures are according to ITU calculations using 2008-2019 data from 145 countries that simulated the impact of 50 policy reform measures and institutional characteristics on 13 indicators of digital infrastructure sector performance.
For the same reason, countries should revisit and raise foreign equity caps in digital infrastructure subsectors. For example, India\(^{82}\) and the Philippines\(^{83}\) have recently permitted 100 per cent foreign ownership in telecommunications, up from 49 per cent and 40 per cent, respectively. This will immediately enable global digital infrastructure firms to invest much larger sums than they were hitherto permitted to do. Similar relaxations (or simplifications) should be made in the rules curtailing foreign firms’ operational freedom, including restrictions on foreign nationals in corporate management, boards and staff, land ownership and capital repatriation.\(^{84}\) Thailand now permits digital infrastructure investors to import expatriate labour, own land and repatriate currency overseas, for example,\(^{85}\) and Cambodia has shortened the registration period for FDI projects from three to two weeks and will protect foreign direct investors against capital controls.\(^{86}\) Such types of relaxations make investors more confident about their ability to control the success of their investments in the relevant host economies.

(b) Implement targeted enhancements in the regulatory regime

Targeted enhancements in the regulatory regime for digital infrastructure are critical in boosting FDI in this sector (Stephenson, 2020; ITU, 2021). Of these, four enhancements seem to have the greatest impact in raising foreign and domestic investment in digital connectivity (figures 9 and 10) and so should be prioritized by host governments (ITU, 2021; Stephenson, 2020): enhancing telecommunications and services, creating a national broadband plan, building data centres and enhancing digital infrastructure overall. Each of these four areas is described below.

- Enhance telecommunications networks and services (i.e., fixed and mobile broadband). In this context, spectrum sharing, convergent licensing, competition and independent regulation are likely to have the greatest impact in raising foreign and domestic investment in digital connectivity (figure 2) (ITU, 2021; Stephenson, 2020).

- Spectrum and infrastructure sharing. Permitting operators to voluntarily share spectrum “is associated with an 18 per cent increase in mobile investment and network coverage by more than 17 per cent, price reduction by close to 10 per cent, and mobile penetration by more than 3 per cent after two years” (figures 9 and 10) in countries that did so (ITU, 2021). Governments could further encourage FDI in mobile broadband by releasing more spectrum, making spectrum allocation more transparent and efficient, bringing spectrum prices down to international levels, encouraging experimentation with new spectrum-based technologies, and assigning the same bands for the same uses as is done internationally (GSMA, 2018; ITU, 2021).

- Host Governments should also proactively expand infrastructure sharing and co-deployment, by permitting foreign and domestic operators to run...
broadband fibre or mount equipment on public infrastructure (such as electricity poles, roads, railways, and oil, gas, water and sewage pipelines), as India, Bangladesh and Myanmar have done, or to build towers or other infrastructure on government land, as the Philippines has done (ITU, 2019). In ‘last mile’ and hard-to-reach areas, they could encourage municipal governments, NGOs and local business to share infrastructure with foreign and domestic firms (WEF, 2014; ITU, 2019b). They could even commission or subsidize a public or private telecommunications company to expand the physical network and share it with foreign and domestic counterparts, as Malaysia has done.

- To enable effective infrastructure sharing, host countries must systematically map all public infrastructure (electricity poles, road, railways, sewage systems etc.) and connectivity assets (towers, cable ducts etc.) (WEF, 2014; ITU, 2019b), as Hong Kong, China is currently doing. IPAs should work with the necessary authorities to pro-actively provide this information to foreign direct investors as they plan and execute their projects.

- Within the Asia-Pacific context, it could also be interesting to explore spectrum and infrastructure sharing through regional and subregional cooperation mechanisms. For example, infrastructure sharing initiatives through ASEAN could boost digital infrastructure FDI to the subregion while also contributing to uplifting of the digital capacity of its LDC members.

- Convergent ‘technology neutral’ licences can lead to an “increase of mobile investment (by) 10 per cent, network coverage by more than 9 per cent, and price reduction by more than 5 per cent, after two years” (figures 9 and 10) (ITU, 2021e). Also crucial is the enhancement of the transparency and speed of licensing and associated environmental and ‘right of way’ permits, even for foreign direct investors in undersea cables, the need for whom will grow as Asia’s digital economy expands.

- Competition and independent regulation. The mere presence of a functioning national competition authority (non-sector specific) can increase mobile investments by 10 per cent, “network coverage by close to 9 per cent, and price reduction by more than 5 per cent after two years” (ITU, 2021e). Host countries should therefore focus on creating this institution, as Azerbaijan, Armenia, China, Myanmar and Viet Nam did, for example.

- Host countries could enable their ICT regulator to be financially or operationally independent from the Government, as in Singapore; Malaysia; Thailand; and, India. The

87 For example, India, Bangladesh and Myanmar have enabled telecommunications companies to lay thousands of kilometres of fibre optic cable along roads and railways.
88 The Government of Malaysia gave Telekom Malaysia a 20 per cent capital subsidy to build a high-speed broadband network, but required it to share the resulting physical infrastructure with other service providers, including foreign direct investors. (WEF, 2014). Sharing triggered a tripling in Malaysia’s broadband penetration from 22 per cent to 66 per cent between 2009 and 2013 (WEF, 2014).
91 Ibid.
ITU’s modelling (ITU, 2021e) shows that a 10 per cent increase in the ICT regulator’s independence, accountability and power to enforce regulation is associated with an 8 per cent rise in investment, both by domestic and foreign firms, in both fixed and mobile broadbands. To further enhance competition and independent regulation, host Governments should spin-off or privatize state-owned firms into independent entities, and regulatorily treat them as akin to other players, as the United States and the United Kingdom have done.

- Create a National Broadband Development Plan to increase investment in digital infrastructure. Such plans have been shown to increase investment in digital infrastructure by 15 per cent while also contributing to an increase of 14 per cent in network coverage and reducing costs of digital services by 8 per cent (ITU, 2021e). At minimum, this plan should include: clear targets for the reach and coverage of each digital infrastructure subsector and associated services; the quality of connectivity, particularly upload and download speeds; device ownership and usage; digital literacy; projected capital requirements; and target sources of finance (UNCTAD, 2017; World Bank, 2019). Equally vital, this plan should publicly assign operational leadership, responsibility and accountability for each target (UNCTAD, 2017; World Bank, 2019). A plan with this type of detailing will greatly facilitate investor targeting, investment promotion and investor decision-making (UNCTAD, 2017; ITU, 2021e).

- Governments will also need to create the regulatory and operational environment to boost data centre investments. For this, they will have to focus on an entirely different set of issues than those discussed above. Most critical of these is to provide investors with uninterrupted high-quality electricity – preferably ‘green’ – and water, both of which are needed to run and cool servers and storage systems. Equally, foreign data centre investors need large tracts of land across a variety of locations to create a network of simultaneously operating Data Centres, so that if one goes down there are enough back-ups to instantly kick into action.

Host country attractiveness to foreign data centre investors is also strongly impacted by local policy and governance factors, which it is important to address.

Countries that have introduced number portability have also seen a notable rise in investment and coverage (ITU, 2021e). Universal service fund (USF) reform is another area for action. Countries should broad-base the USF levy to all digital infrastructure investors and consumers (ITU, 2021d; Broadband Commission, 2021; GSMA, 2016). Tanzania is doing this, for example, by extending it to all Internet service providers and post/courier firms (Broadband Commission, 2021). Countries should also give telecom operators the choice to either pay this levy or instead undertake a government-authorized project to extend connectivity to non-profitable areas, as in Vanuatu (ESCAP, 2017) and Morocco and Argentina (Broadband Commission, 2021).

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A leading concern is whether local governments make service ducts and utility corridors available to foreign direct investors to lay connections between towers and Data Centres. Another is whether frequent road-digging by multiple local agencies creates a continual risk of connecting cable breaks or “hits” to Data Centres. Data centre investors also worry about the local availability of Data Centre workers with specialized training in power, fibre, mechanical cooling, security, civil engineering and software programming.

India’s draft national Data Centre Policy, designed to boost FDI into this sector, offers an insight into the types of issues IPAs and host Governments will need to resolve to draw foreign investors into Data Centre development.

**Box 4**

**India’s draft national Data Centre policy**

The Government of India seeks to attract billions of dollars in FDI to develop India into a global hub of internationally connected hyperscale data centres, cloud service providers, IT companies, digital economy R&D units and allied industries. It thus permits 100 per cent foreign ownership in Data centres, and its draft national Data Centre Policy proposes to offer foreign (and domestic) data centre investors the following conveniences:

(a) Pre-provisioned Data Centre Parks – State governments will create special zones to house Data Centre Parks and pre-provision them with completed approvals, demarcated land parcels, uninterrupted, high-quality affordable electricity, high-quality and affordable international connectivity, and high-capacity network back-haul so that Data Centre service providers can just ‘plug and play.’

(b) Securing connectivity backhaul – Local governments will create common service ducts/ utility corridors to safely carry fibre optic cable and dark fibre to/from Data Centres, to protect them from damage and resulting downtime. Local government will completely map all network infrastructure and institute a Dial Before You Dig Policy to prevent unsystematic digging.

(c) Infrastructure sharing – Local governments will promote and incentivize the deployment of common sharable, passive as well as active, infrastructure to promote efficiency and reduce service provider costs.

(d) Priority status – Foreign and domestic-owned Data Centers will be awarded ‘Infrastructure Status’ and declared an Essential Service. They will be permitted to import dual use network equipment for internal use and to create their own captive fibre networks to connect their varying locations. They can also procure electricity directly from renewable energy producers and generate their own green electricity.

(e) Other incentives – The Government will also provide incentives to i) foreign-owned and invested data centres using locally-sourced hardware and equipment and ii) foreign data centre equipment manufacturers setting up local units. It will also invest in large scale workforce training, and strengthen data centre testing and certification.

**Sources:** NASSCOM, 2020, NASSCOM’s Recommendations for Data Centre Policy. Available at https://community.nasscom.in/communities/policy-advocacy/nasscoms-recommendations-for-data-centre-policy.html.


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95 This policy was drafted in close partnership with India’s national technology industry association, NASSCOM (https://nasscom.in/) and Indian state governments that have attracted major foreign direct investments from Microsoft and Amazon Web Services and in data centre operations.
Digital infrastructure sector overall – There are some enhancements that cut across the digital infrastructure sector overall. Leading among these is to lighten the fiscal and financial burden on digital infrastructure investors (telecommunications companies in particular) to boost foreign direct investment in this sector. This can be done in the following three ways.

First is to waive or reduce taxes, fees and other payments imposed on foreign digital infrastructure investors (ITU, 2021d; Broadband Commission, 2021). Reducing corporate taxes in this sector can lead to a 14 per cent increase in total foreign and domestic investment in digital infrastructure. (ITU, 2021e). Malaysia, for example, has waived corporate income tax for foreign digital infrastructure investors for 10 years equalling the amount of their capital spending in that period,96 and Thailand has waived it for foreign direct investors in submarine cables, Data Centres and cloud services for eight years.97 The Republic of Korea has changed the way it calculates its infrastructure tax to encourage digital infrastructure firms to employ the latest technologies (Broadband Commission, 2021).

Second is to reduce taxes and customs duties on network equipment and connectivity hardware and devices (ITU, 2021d; Broadband Commission, 2021). For example, Pakistan removed its 16 per cent VAT on mobile handsets, which raised handset affordability and sales (ITU, 2021d).

Third, host countries could devise other types of fiscal and financial incentives. They could, for example, give tax breaks to real estate investment trusts (REITs) that encourage digital infrastructure investments in, say, mobile towers and data centres, and for digital infrastructure-related software development and support services, as India and the Philippines have already done (ITU, 2021d). Or they could allow investors that create or upgrade high speed broadband networks to expand their investments in the first year, to reduce costs and spur further rollout.98

5.2.2. Policy recommendations for attracting FDI to support digital adoption of firms

(a) Offer appropriately balanced fiscal and financial incentives

Asia’s advanced digital economies, including China, Japan, the Republic of Korea, Singapore, Malaysia, India and Indonesia, have popularly used fiscal and financial incentives to attract investments from digitalizing foreign direct investors. Most common incentives are: (i) corporate tax exemptions (for between five and 20 years, depending on the priority status of the project); and (ii) import duty waivers on equipment and construction materials (ASEAN, 2021) – see 5.4., item 8, for more information on these types of incentives. Some countries also offer a depreciation allowance (e.g., Cambodia), a tax reduction allowance (e.g., Indonesia), or offer an

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investment tax allowance of up to 100 per cent on qualifying capital investments made within five years of project commencement (ASEAN, 2021). For example, Malaysia offers existing foreign direct investors a reinvestment allowance for automating existing production facilities of over 60 per cent of qualifying capital expenditure. Another type of incentive relates to spending on research and development. India, for example, offers a 100 per cent deduction for R&D expenses, and for specified payments made to a scientific research company or association, university or college, or other institution for scientific and statistical research.99

(b) Create an enabling framework for FDI by helping businesses to digitalize and encouraging partnerships between the public sector and businesses to build skills

IPAs and Governments together can build sector-specific digital and data analytics skills by working closely with the investor community and local technical universities to identify and develop the digital skills required in the sectors they will be targeting for investments by digitalizing firms. For example, the Government of Singapore has tied up with Amazon Web Services (AWS) to create the Cloud Ready SG programme,100 which is systematically building a range of cloud-based skills among Singaporean graduates, early career workers and mid-career professionals with cloud-based skills. Cloud Ready SG responds to an AWS-commissioned investor survey of evolving digital skill needs in the Asia-Pacific region.101 It found that cloud-based skills will be critical going forward.

It is essential that talent development focuses on building a combined understanding of specific sectors and industry verticals, and Big Data analytics and Artificial Intelligence. To this end, Governments and IPAs have begun to collaborate with digitalizing foreign direct investors to set up and run digital skills training universities and programmes. In India, for example, the Bangalore government and Bosch have jointly established a specialized development and training centre to build Industry 4.0 skills in the local workforce, especially the underprivileged. Students can train in nine facilities, including a mechatronics lab, a modern manufacturing lab a modern carpentry lab, information and communication technology (ICT) lab (and a hand-held phone and audio-visual lab and a home appliances lab that Samsung has set up within this centre). Other examples from the Asia-Pacific include Siemens’ Digital Industry Academy’s (SITRAIN)102 and Huawei’s Training Academy’s103 growing network of government-supported training centres in the region.

Also essential is the building the skills that digitalizing firms would need to successfully market and sell their products/services and engage with service customers using digital platforms, or to successfully run digital platforms that enable other market players to transact and do business. Key among these are skills are platform governance, platform strategy partner relationship management, partner data management and partner product management. Digitalizing foreign direct investors now seek such skills when investing both at home and overseas (HBR, 2021).

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103 See https://e.huawei.com/en/material/bookshelf/bookshelfview/20190907/73d6b8e5f4b14d2d9d16e7bdcab4d6e4.
(c) Digitalize industrial parks and SEZs

Host countries should digitally connect industry parks and Special Economic Zones with 5G and hyperscale broadband, so they can support state-of-the-art Industry 4.0 projects (ASEAN, 2021), as China – for example – is doing in Shenzhen\(^{104}\) and Urumqi.\(^{105}\) If possible, they should even invest in providing digital solutions, robotics, and automation, to upgrade factories, and guide companies on how to use these, as Thailand is doing.\(^{106}\) Thailand is also incentivizing private participation in the development of smart industrial estates or Industry 4.0 clusters, and the conversion of former industrial estates into smart cities, through a corporate income tax exemption of 5-8 years.\(^{107}\) Another strategy is to build dedicated Industry 4.0 clusters, and link them to science and technology centres, centres of excellence, and R&D centres as Singapore is doing, in the Jurong Innovation Park\(^{108}\) and the Advanced Remanufacturing and Technology Centre (ARTC).\(^{109}\)

5.2.3. Policy recommendations for attracting FDI in digital businesses

(a) Building digital skills through building partnerships with businesses

Host countries will have to build both digital ‘consumer’ and ‘producer’ skills to make their economies attractive to foreign digital business investors. Fortunately, developing Asia’s consumer skills is already fairly advanced. The region does much better than all other developing regions, except Africa, in using the Internet for social interaction, entertainment, banking, and purchasing goods and services online (figure 11). However, it performs poorly on ‘producer skills’, such as selling goods and services online, participating in online professional networks and uploading self-created content.

In building the necessary ‘producer skills’ for digital business, host countries will have to focus on: (i) the higher-end skills that digital business needs to continually develop new technologies, and (ii) the skills local workers would need to be employed by sharing economy, gig economy and other digital platforms (APEC, 2021).

Many countries already have active digital skills development programmes, such as Malaysia’s Digital Skills for Professionals programme\(^{110}\) and Singapore’s Skills Future for Digital Workplace.\(^{111}\) Many foreign direct business investors, such as Microsoft\(^{112}\) and Amazon,\(^{113}\) are also running mass programmes of digital training in the developing countries in which they have invested. In addition, countries – such as Singapore – are now strategically incentivizing foreign digital business investors to develop local talent by offering them salary subsidies (box 5).

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\(^{108}\) For more information, please see https://estates.jtc.gov.sg/jid/about#overview.

\(^{109}\) For more information, please see https://www.a-star.edu.sg/artc.

\(^{110}\) For more information, see https://www.malaysia.gov.my/portal/content/30833.

\(^{111}\) For more information, see https://www.skillsfuture.gov.sg/digitalworkplace.


What do individual Asian consumers use the Internet for?

![Bar chart showing Internet activities undertaken by individuals, by level of development and region](chart.png)

**Source:** Author, constructed from UNCTAD, 2021b, data.

**Box 5: Salary subsidies for digital talent**

SGUnited Traineeships Programme pays 80 per cent of the salary of fresh Singaporean graduates hired by foreign direct investors as trainees. Traineeships last 4-to-6 months, after which firms hire the trainees that they like. Besides encouraging investments by established digital economy firms, this programme makes it much easier for start-ups to afford Singapore’s best talent from its leading universities and training institutions. This gives participating firms’ a growth boost, while steeping trainees early on in entrepreneurship, digital skills and venture capital.

Similarly, Singapore’s SG United Mid-Career Pathways Programmes reimburses firms that host and retrain local mid-career professionals up to 90 per cent of their stipends during the six-month training and/or attachment period.

**Source:** SGUnited Traineeships Programme for Host Organizations. Available at https://www.wsg.gov.sg/SGUnitedTraineeships-HostCompanies.html
When critical digital talent is not locally available, some governments – such as Malaysia\(^\text{114}\) and Singapore\(^\text{115}\) – relax work permit and immigration rules to permit foreign direct investors to quickly import the skills they need. Some Governments, including those of Thailand and Singapore, are going a step further to issue special visas to highly skilled foreign talent that could be harnessed to build local digital skills and industries. Thailand’s Smart Visa\(^\text{116}\), for example, encourages science and technology experts, senior executives, investors, digital start-ups and their families to live and work in the country for up to four years, without applying for a work permit. Singapore’s Tech Pass\(^\text{117}\) exempts qualifying professionals from having to be sponsored by a local employer to live and work in the country, and gives them the freedom to switch employers, employ local workers, start their own firm, make local investments, and become director or advisor in one or more Singapore-based tech companies.

(b) Enhancing the regulatory framework for FDI in digital business

Host countries must work on three fronts to create laws and regulatory structures for foreign direct investment in digital business.

- Foundational laws: First, they must create the laws and regulations that enable digital businesses to operate and that protect consumers (ITU, 2020b). Typically, these are laws that (i) define e-commerce/digital business and recognize them as legitimate economic activities, (ii) specify the types of firms that undertake such business, (iii) recognize digital payments and digital documents, and stipulate firms’ responsibilities to their consumers and (iii) the liabilities they will incur if these are breached.\(^\text{118}\)

For digital businesses to operate, host countries must, at minimum, also have in place laws on data and intellectual property protection, cybersecurity, e-commerce, e-transactions, digital financial services (including electronic money) and competition (UNCTAD, 2017; ITU, 2020b). Not only are these foundational laws for digital business, they would also address the principal concerns of foreign direct investors in this sector.

- Regulatory convergence: Alongside, they must modify regulatory frameworks to keep abreast of digital business as it progressively operates cross-sector,\(^\text{119}\) (UNCTAD, 2017). For this reason, the ICT regulator (the principal regulator governing digital business in most countries) must closely collaborate with the regulators overseeing (i) data protection, (ii) financial services, (iii) consumer protection, (iv) competition policy, (v) spectrum allocation, (vi) broadcasting, (vii) energy and (viii) the Internet (ITU, 2020b). For the same reason, the ICT regulator will need to collaborate closely with the sector regulators overseeing digital business

\(^\text{114}\) For more information, see https://mscstatusoffice.com/faq/what-benefits-does-a-msc-status-company-entitle-to.
\(^\text{116}\) For more information, see https://smart-visa.boi.go.th/smart/index.html.
projects within their jurisdictions (ITU, 2020b). For example, to properly monitor and support an agricultural drone project, the ICT regulator would need to work jointly with the agriculture department.

(c) Liberalizing the rules on foreign direct investment in digital business

The rules that restrict FDI by digital business must be relaxed (UNCTAD, 2017; ASEAN, 2018). Not only does this include restrictions in traditional digital economy sectors, such as information technology, but also in traditional physical sectors, such as transportation, agriculture, financial services and health. The expanding cross-sector interplay in digital business investments makes it imperative for host countries to adopt a converged approach to FDI regulation, so that they do not inadvertently hold back expanded FDI in digital business (UNCTAD, 2017; ASEAN, 2018). The Republic of Korea, for example, recently relaxed a longstanding ban on foreign firms providing digitally-enabled ride-sharing services, which it had enacted to protect local taxi operators. Although this FDI restriction related to transportation, it held back the development of digitally-based economic activity in this sector. Similarly, Indonesia removed its 30 per cent foreign equity cap in horticulture, enabling foreign firms with digital solutions for this sector to invest, or expand their investments, in the country.

FDI restrictions in physical sectors make it difficult for foreign digital firms to invest overseas to bring cutting-edge technologies to physical activities, many of which are likely to drive digital economy growth this coming decade. Already, the growing global digital economy has encompassed many of these to create novel and rapidly growing industries (such as shared mobility, fintech, telehealth, edtech and agtech). Outdated restrictions will only hold host economies back from fully reaping the benefits of such developments. For the same reason, host countries should carefully vet all their international investment and trade agreements, so that these do not inadvertently restrict FDI in sectors of interest to digital business as it evolves (UNCTAD, 2017). Host countries should also ensure that these agreements deal adequately with digital economy issues, such as the protection of digital assets or the rights and responsibilities of purely digital business (UNCTAD, 2017).

(d) Testing regulatory attractiveness to foreign investors

Host countries could further fine-tune their FDI regulatory framework by using a simple, but practical, test proposed by an international group of FDI and digital economy experts. (Stephenson and others, 2021). This is to pilot-driven digital business projects in priority sectors as well as to observe and remedy the regulatory challenges, as members of the Digital Cooperation Organization are doing in partnership with the World Economic Forum. Technology ‘sandboxes’ (box 6) are also a useful illustration in this context.

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120 Ibid.
124 For more information, see https://dco.org/.
125 The first pilot will be run in Nigeria. For more information, see https://www.weforum.org/press/2022/05/new-initiative-to-strengthen-cross-border-investment-in-the-digital-economy.
(e) Liberalize the rules on cross-border ‘working capital’ and ‘venture capital’ flows and enhance the ease of doing business

Most crucial in this context is for prospective host economies to 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. In this regard, they should also rethink policies and strategies on transfer pricing. Many foreign digital business investments require close and ongoing collaboration between the local

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Box 6
Harnessing technology ‘sandboxes’ to advance digital economy regulation

Many Governments have technology ‘sandboxes’ to test promising new digital economy offerings and advance the relevant regulation. In each sandbox, Governments competitively select firms with novel technologies to live-test their offerings with a limited group of volunteers. During the test period (which can run from two weeks to two years) the Government relaxes existing regulations for participating firms, who can be foreign but must be registered locally and have local bank accounts. Once it is clear how existing regulation should be improved for a successful national rollout of the technology under test, Governments initiate the necessary reform and formally permit qualifying firms to operate.

The Philippines’ Central Bank, for example, initiated a sandbox to experiment with peer-to-peer mobile money applications. It gave two telecommunications companies permission to partner with non-bank entities to deliver digital money to consumers. It carefully monitored the experiment and – in 2009 – publicly released national guidelines on the use of electronic money.

Similarly, Malaysia’s Central Bank initiated a sandbox to test new eKYC and digital onboarding technologies in 2017. Two fintech firms and seven banks qualified to participate. One of the participating firms, MoneyMatch, developed cross-border online peer-to-peer remittance services and piloted video-conferencing technology to digitally onboard potential clients. It also devised a platform to connect individuals and SMEs desiring to buy and sell currencies. It used facial recognition technology to verify users. Its pilot was successful, and in June 2019, it received formal approval from Malaysia’s Central Bank to operate in the country, after the latter had made the necessary regulatory modifications.

Alongside Malaysia’s National Technology and Innovation Sandbox\(^{126}\) is testing promising digital applications in health care, manufacturing, agriculture, education, travel and tourism, among which are the development of robots to help front line hospital workers treat those affected by stroke and other illnesses, and agricultural robots to enhance agriculture worker efficiency, and automated drones that spray pesticide precisely (Satyanand, P.N. 2021).


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\(^{126}\) National Technology and Innovation Sandbox website at https://sandbox.gov.my/.
subsidiary and the parent firm, particularly in the case of ‘captives.’ Typically, Governments limit or tax such transactions to guard against transfer pricing, which creates drag on operations. To minimize this risk, countries such as India\textsuperscript{127} and Viet Nam\textsuperscript{128} have introduced Advance Price Agreements (APAs). These enable foreign direct investors to agree with host Governments in advance on a fair tax for the next three to five years, based on their expectation of what they are likely to pay the parent company every year. The foreign direct investor is protected against sudden tax changes and the host country against transfer pricing. Such types of agreements are likely to give foreign direct investors more confidence about investing in new locations, as India’s experience shows.\textsuperscript{129}

(f) Improve physical connectivity in the host country

Countries wishing to attract investments from e-commerce, mixed digital and ‘brick-and-mortar’ firms selling physical products online to customers nationally and internationally will need to ensure world-class physical connectivity, given the intensifying competitive pressure to fulfil local and international orders as quickly as possible. Countries with limited digital connectivity will not be attractive for FDI from digital businesses. Instead, such countries should focus on attracting FDI in digital infrastructure (see chapter 5.2).

(g) Interoperability across national customs and logistics systems

Countries wishing to attract investments from e-commerce and mixed digital firms (and traditional ‘brick-and-mortar’ firms) selling physical products online to customers internationally will also need to (i) work with other countries to ensure the digital interoperability of national customs and logistics systems, and (ii) resolve the differences in national trade classifications that are tending to pose a problem to international e-commerce\textsuperscript{130} (ADB, 2021) as, for example, the Economic Community of West African States (ECOWAS) is doing.\textsuperscript{131} As UNCTAD explains,\textsuperscript{132} “the cost-effective and rapid movement of goods can have as much to do with a product’s data as with a product itself. This is increasingly the case as the shift toward paperless trade is premised on policy delivery and compliance through digital means.”

(h) Offer appropriately balanced fiscal or financial incentives

Asia’s leading digital economies offer a variety of fiscal and financial incentives to

\textsuperscript{127} See https://www.incometaxindia.gov.in/Lists/Latest\%20News/Attachments/360/FINAL\_ANNUAL\_REPORT\_29\_11\_19.pdf.
\textsuperscript{130} For more information see https://mag.wcoomd.org/magazine/wco-news-87/why-governments-and-customs-continue-to-need-their-own-classification-system-for-goods/.
innovative digital businesses developing new technologies or business models.\footnote{Some countries, such as Thailand, also make some of these incentives available to investors in e-commerce (ASEAN, 2018).} Typically, these incentives fall into the following broad categories:

(a) **Fiscal incentives**

- **Income tax exemptions.** This can include a certain percentage of income tax exemption for several years, and a concessionary tax rate for some years afterwards (ASEAN, 2021). For priority projects, such exemptions can extend to as much as 15 years (Malaysia) or 20 years (Indonesia) (ASEAN, 2021). Venture capitalists investing in e-commerce and digital economy start-ups also receive income tax exemptions (ASEAN, 2018).

- **Investment tax allowance/depreciation allowance.** Also popular are investment tax allowances for technology, software and other qualifying capital spending in the first few years of the project set-up, including relevant software and technology purchases. China and Malaysia offer a 100 per cent allowance for the first five years, for example (ASEAN, 2021). Some countries offer a depreciation allowance (e.g., Cambodia) and others (e.g., Indonesia) a tax reduction allowance (ASEAN, 2021).

- **Import duty waivers.** Most countries, including Brunei, Cambodia and Indonesia, waive duties on the import of core equipment and construction materials or offer duty concessions (ASEAN, 2021).

(b) **Financial incentives**


- **Operational subsidies.** As mentioned earlier in this report, some countries now subsidize a variety of operational costs for innovative foreign digital business investors as well as the foreign venture capital/service firms that support them. These subsidies include rent subsidies, salary subsidies, subsidies on capital investment expenses and subsidies on strategic events. Beijing’s Zhongguancun National Innovation Development Zone, for example, offers a partial rent subsidy to nationally strategic foreign and domestic high-tech entrepreneurs for up to two years.\footnote{The People’s Government of Beijing Municipality, 2021, Measures of Zhongguancun National Innovation Demonstration Zone on Administration of Support Fund for Improving Entrepreneurship Service and Promoting Talent Development. Available at http://english.beijing.gov.cn/investinginbeijing/two_zones/Talent_Policies_of_the_Two_Zones/202107/t20210705_2428643.html.} Singapore’s Startup SG Accelerator programme incentivizes renowned foreign accelerators to set up locally by underwriting some of their programme development, start-up mentoring and
operating expenses. The degree of offset is determined by the extent to which the accelerator/enabler meets its pre-agreed targets with SSGA.

- Risk subsidies and minimum guarantees. Some Governments incentivize FDI by absorbing some of the loss, should the investment go bad.

(d) Non-financial incentives

- These can include a variety of things such as expedited work permits and ‘smart visas’ for foreign workers or other incentives including relaxation on foreign equity restrictions and land ownership, for example, as offered by Thailand (ASEAN, 2018).

5.2.4. Activities and measures for IPAs to undertake to attract, promote and facilitate digital FDI

Regulatory reform must be complemented by pro-active investment promotion and facilitation by investment promotion agencies (IPAs). Winning digital economy investments can take years of patient and systematic effort, involving lengthy and detailed planning, capital mobilization, government permissions, 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. Therefore, this section summarizes those actions and measures, and notes when and where they need to be augmented in a specific type of digital FDI.

(a) Ensure policy consistency and Enhancing the ease of doing business and local skill sets

IPAs can contribute to enhancing the ease of doing business in the country to attract more investment in the digital economy. This can be done by adopting some of the following measures.

- E-portal for company registration and business licences IPAs should simplify and speed investor entry and establishment, as Singapore and Malaysia have done. These countries offer online e-portals (linked to all relevant government departments) that enables investors to register their companies, open a bank account, apply, pay for and renew relevant licences and permits, and complete other start-up formalities over a single website. It is also important for host countries to consider how they might broaden the scope of licences, so that digital business investors do not have to obtain a separate licence for related activities and have the operational flexibility to respond to new market opportunities. Brazil, Germany and South Africa, for example, do not separately licence digital and traditional banks, enabling both to offer a wider range of cross-cutting services.

- Developing tech-ecosystems (i.e., venture capital and technology innovation hubs): To create local tech ecosystems that enhance FDI, IPAs will need to coordinate with other line agencies and advocate developing such an ecosystem. Their efforts can be guided by the ongoing efforts of Asia’s more advanced digital economies, including Singapore, Malaysia, China and India.

137 For more information see https://www.startupsg.gov.sg/programmes/4900/startup-sg-accelerator.
138 See https://www.gobusiness.gov.sg/ligences.
Focus promotion activities on a specific location or technology. Some countries are focusing on a specific area within or surrounding a principal city, and especially equipping it with world-class digital connectivity, research and workspace infrastructure, and incentives for foreign digital business investors. An example is Malaysia’s Multimedia Super Corridor (MSC Malaysia), a global digital innovation hub for 15 key digital technologies. Other countries are focusing on smaller areas and fewer technologies. Bangkok's seven innovation districts serve as a good example, as each district focuses on a different sector based on salient local features and expertise of those districts. Such ‘area-based innovation’ encourages close collaboration between foreign and local digital firms, universities, hospitals, startups, local experts and residents. (ASEAN, 2021).

Promote a location’s world-class living environment to potential investors: Also integral to tech-ecosystem development is upgrading these areas into globally connected, world-class cosmopolitan living environments that attract and retain the world’s best digital talent, by offering top-end residential, commercial, leisure and outdoor facilities. Singapore’s Jurong Innovation District is a leading example. Such areas tend to attract more FDI than a country’s other cities due to superior global connectivity as well as an agglomeration of advanced producer services and knowledge-intensive activities; once established in such environments, investors feel confident to expand into the rest of the country or region.

Employ a ‘whole-of-ecosystem’ approach in investment promotion activities. To successfully develop a tech ecosystem, IPAs must adopt a ‘whole-of-ecosystem’ approach (box 7) that simultaneously targets FDI from all tech-ecosystem players, including digital firms and startups, venture capital funds, incubators, accelerators as well as law, public relations and market research firms.

Develop local skills. IPAs and Governments together can build sector-specific digital and data analytics skills by working closely with the investor community as well as local technical universities to identify and develop the digital skills required in the sectors they will be targeting for investments by digitalizing firms. For example, the Government of Singapore has tied up with Amazon Web Services (AWS) to create the Cloud Ready SG programme, which is systematically building a range of cloud-based skills among Singaporean graduates, early career workers and mid-

141 For more information, see https://mdec.my/what-we-offer/msc-malaysia/.
142 These technologies are Big Data analytics, artificial intelligence, fintech, Internet of Things, cybersecurity, Data Centre and cloud, blockchain, creative media technology, sharing economy platform, 3D printing, robotics, autonomous, user interface and user experience, integrated circuit (IC) design and embedded software, systems/network architecture design and support.
143 These are the Bangkok CyberTech District, the Yothi Medical Innovation District, the Kluaynamthai Innovative Industries District, the Pathumwan Innovation District, the Khlong San Innovation District, the Rattanakosin Innovation District and the Latkapubn Innovation District (ASEAN, 2021).
145 For more information, see https://estates.jtc.gov.sg/id/about#master-planner-developer.
146 When Do Firms Choose Global Cities as Foreign Investment Locations within Countries? The Roles of Contextual Distance, Knowledge Intensity, and Target-Country Experience, René Belderbos, Helen S. Dua, Arjen Slangenb.
Beijing’s Zhongguancun National Innovation Demonstration Zone offers a powerful example of ‘a whole-of-ecosystem’ approach to tech-ecosystem development. Aiming to be leading global hub of digital economy innovation, it employs the following threefold strategy to attract the best in global tech talent, tech funding, and business mentoring and services.

- **Attracting tech talent.** The Zone rewards its constituent tech parks with CNY 100,000 to every foreign direct investor and CNY 50,000 for every returning Chinese expatriate investor they attract.
- **Attracting capital.** The Zone provides a 10 per cent risk subsidy to investing angel and venture capital funds to providing early-stage funding for Zone-registered start-ups.
- **Attracting entrepreneurship service agencies.** The Zone reimburses entrepreneurship service agencies 50 per cent of the investment required to start support services to Zone-registered foreign start-ups and firms, including talent search and matchmaking, domestic and overseas policies publicity, research on relevant international firms and service agencies, investment and financing services, and talent training and exchange. It also reimburses them 30 per cent of their investment in the professional equipment and technology facilities (R&D lab, pilot test, small-batch trial production, inspection and testing) and they offer technology entrepreneurs incubating new technologies. The subsidy covers construction, purchase, lease, and reconstruction and upgrading of professional hardware and software, and recruitment of technicians.\(^\text{148}\)

It also reimburses them 30 per cent of their costs (site rental, construction fee, and equipment leasing) in organizing entrepreneurship and innovation activities, including technology competitions and international festivals. Professional services firms offering human resources, intellectual property, and legal and tax support to more than 30 zone enterprises receive a full rental subsidy for up to two years.

Finally, it incentivizes such agencies to attract foreign firms into newer areas within the Zone, through a 10 per cent commission on the aggregate economic contribution by each firm.


career professionals with cloud-based skills. Cloud Ready SG responds to an AWS-commissioned investor survey of evolving digital skill needs in the Asia-Pacific region.\textsuperscript{149} It found that cloud-based skills will be critical to going forward. It is essential that talent development focuses on building a combined understanding of specific sectors and industry verticals, and Big Data analytics and artificial intelligence. To this end, Governments and IPAs have begun to collaborate with digitalizing foreign direct investors to set up and run digital skills training universities and programmes. In India, for example, the Bangalore government and Bosch have jointly established a specialized development and training centre to build Industry 4.0 skills in the local workforce, especially the underprivileged. Students can train in nine facilities, including a Mechatronics Lab, a Modern Manufacturing Lab, a Modern Carpentry Lab, Information and Communication Technology (ICT) Lab (and a hand-held phone, Audio-Visual Lab and a Home Appliances Lab set up by Samsung within this centre). Other examples from the Asia-Pacific include Siemens’ Digital Industry Academy’s (SITRAIN)\textsuperscript{150} and Huawei’s Training Academy’s\textsuperscript{151} growing network of government-supported training centres in the region.

Regulatory reform must be complemented by pro-active investment promotion and facilitation by investment promotion agencies (IPAs), since it typically takes years of patient and systematic effort to win foreign digital infrastructure investments (WEF, 2014). In fact, the digital economy executives and investment promotion officials interviewed for this Guidebook warned that it can take between six to eight years of IPA hard work between first contact with the investor and project fruition.

Policy consistency and maturity are therefore essential. Since some digital economy investments are costly and complex, for example, digital infrastructure projects require years of careful planning, capital mobilization, supplier and employee contracting, government permissions, and construction (WEF, 2014). Sudden policy reversals can badly dent projects and investor confidence.

(b) Digital economy expertise in IPAs

Given the complexity of the digital economy, IPAs should have dedicated sector experts in charge of promoting investments within each digital economy sector in which they are targeting digital FDI. Each expert should devise a clear ‘account plan’ for each target investor, including how to initiate contact, what pitch to make and how to remain in touch.

(c) Investor targeting

Investment promotion in the digital economy has a greater impact when countries focus their energies on priority sectors and investors (OECD, 2021). To this end, prospective host Governments and their IPAs should identify target sectors, technologies or activities in which they feel FDI could have the most impact in driving digital transformation and pursue the relevant investors.

For example, to identify and target digital infrastructure investors, prospective host countries should identify digital infrastructure

\textsuperscript{151} See https://e.huawei.com/en/material/bookshelf/bookshelfview/20190907/73d6b8e5f4b14d2d9d16e7bdcab4d6e4.
investors in neighbouring countries and systematically monitor foreign digital infrastructure investments in nearby countries to reach out to those investors. Firms that have invested in a region are more likely to expand within that region (particularly in contiguous countries) than try a new location. Telenor’s investments in Asia, for example, concentrate in Pakistan, Bangladesh, Myanmar, Thailand and Malaysia,152 and Ooredoo’s in Indonesia, the Lao People’s Democratic Republic, Maldives, Myanmar and Singapore.153 For the same reason, IPAs should monitor digital infrastructure investments by international investment funds, such as KKR154 and Blackrock,155 and investment banks, such as Goldman Sachs156 and Morgan Stanley.157 Such funds and banks co-finance foreign digital infrastructure projects, and so can be a key player in overseas investment decisions.158

At the same time, it is also wise to target a mix of firms, large, mid-size and small. Innovative small firms are also responsible for many of the technological breakthroughs propelling digital infrastructure advancement. Also, to ensure healthy competition, each digital infrastructure sub-sector should have at least three-to-four functioning operators.

IPAs should study target investors’ supply chains and reach out to their principal suppliers to invest. Firms will feel more confident about investing in new locations if their key suppliers are close on hand.

For digital adoption and digital business investments, IPAs should target all potential foreign direct investors in the Industry 4.0 ecosystem (ASEAN, 2021), including:

- Digitalizing businesses;
- Digitalizing suppliers to these businesses (SMEs, in particular);
- Manufacturers of digital and Industry 4.0 equipment, machinery, parts and components, AND technology solutions;
- Firms that invest in creating Industry 4.0 infrastructure (e.g., digitalized industrial parks, sector-specific Industry 4.0 clusters); and
- Firms that create/invest in knowledge and technology-oriented R&D hubs and centres of excellence, and Industry 4.0 skills development centres.

Table 6 offers illustrative examples of firms in each category for the manufacturing sector. IPAs should develop similar mappings of target investors in the primary and tertiary sectors in their country in prioritizing for FDI-driven (or FDI-assisted) digital transformation and digital businesses.

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152 See https://www.telenor.com/about-us/telenor-at-a-glance/.
153 See https://www.ooredoo.com/en/who_we_are/our_markets/.
154 See https://www.kkr.com/kkr-today.
156 See https://www.goldmansachs.com/.
157 See https://www.morganstanley.com/.
(e) Develop and showcase unique local value proposition

Host Governments and their IPAs should develop a clear value proposition\(^\text{160}\) for the specific sectors and investors they are targeting (ASEAN, 2021). This should combine a country’s competitive advantage in a sector with unique country attributes that might be of interest to a target investor (ESCAP, 2022). For example, with many global firms committed to cutting their carbon emissions,\(^\text{161}\) Viet Nam succeeded in winning a pioneering US$1 billion investment from Lego, a global toymaker, in a state-of-the-art ‘smart factory’,\(^\text{162}\) due to its abundance of solar

<table>
<thead>
<tr>
<th>Type</th>
<th>Firm (Nationality)</th>
<th>Type of investment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digitalizing business</td>
<td>Schneider Electric (Germany)</td>
<td>Smart factory manufacturing power and IA products. Digital facilities include virtual and augmented reality, open interoperable architecture and platform for real-time tracking of performance, operations and machinery, and preventive maintenance.</td>
</tr>
<tr>
<td>Digitalizing supplier to a digitalizing business</td>
<td>Grey Orange (Singapore)</td>
<td>Supplier of hardware, industrial automation, logistics, robotics and software.</td>
</tr>
<tr>
<td>Industry 4.0 equipment/parts manufacturer</td>
<td>Ametek EIG (United States of America)</td>
<td>Manufacture electronic instruments and electromechanical devices (including industrial automation hardware).</td>
</tr>
<tr>
<td>Investor in Industry 4.0 Centre of Excellence</td>
<td>Rockwell Automation (United States of America)</td>
<td>Rockwell Automation’s Connected Services Experience Centre in Singapore demonstrates integration of technology platforms for IT and OT convergence. The centre offers customers the benefits of connected enterprises through deployment of digital technologies.</td>
</tr>
<tr>
<td>Investor in R&amp;D Centre</td>
<td>NXP Semiconductors (Netherlands)</td>
<td>NXP Semiconductors’ R&amp;D Laboratory in Singapore develops next-generation technologies, including security chips used in biometric passports and automotive sensors.</td>
</tr>
<tr>
<td>Investor in Industry 4.0 Skills Training Institute</td>
<td>Bosch (Germany)</td>
<td>Bosch Rexroth Regional Centre (for advanced manufacturing technologies and skills training) in Singapore delivers training and talent development for advanced manufacturing companies in South-East Asia. It also delivers and certifies Industry 4.0 specialists.</td>
</tr>
</tbody>
</table>

\(^\text{159}\) Available at https://asean.org/book/asean-investment-report-2020-2021-investing-in-industry-4-0/.

\(^\text{160}\) See ESCAP, 2022, chapter 9, https://www.unescap.org/sites/default/d8files/knowledge-products/FDI%20Handbook%202022%3D1%20%281%29_5.pdf.


Since Viet Nam’s unique value proposition is that it is South-East Asia’s largest solar energy generator, with a highly trained workforce and access to this region’s large market for Lego toys, Lego decided to build its first-ever carbon neutral factory there, employing the latest in Industry 4.0 technology, and completely powered by solar energy.164

When reaching out to investors, IPAs should present them with what are, in effect, customized ‘pseudo business plans.’ By providing investors with convincing information on the following issues, IPAs will speed up and support investment decision-making.

For digital infrastructure, IPAs should focus on the following:

- Market development. What is the current number of players in the relevant digital infrastructure subsector? How is the local telecommunications market likely to evolve, especially for data-intensive applications? What is the average revenue per user (ARPU)? What types of related infrastructure and services could new entrants profitably offer to raise their likely ARPU?

- The maturity and fairness of the regulatory framework for digital infrastructure. How modern and technologically-converged is the local regulatory framework for digital infrastructure? What international standards does it follow? What are the local rules on interconnection, shared infrastructure and spectrum, for example? What are licence terms and procedures for each relevant category of digital infrastructure investor? How does the regulatory framework ensure regulatory certainty and fair treatment for new entrants and foreign firms, especially when there are powerful local incumbents? How are potential disputes to be settled?

- Uninterrupted and green electricity. What is the current energy mix (thermal, nuclear, renewable etc.) and how is it likely to evolve in the medium term? Is stable, uninterrupted power available? What are the country’s policies on renewable energy, and how much is available to run digital infrastructure operations? Is captive generation by digital infrastructure investors permitted?

For digital business, IPAs should focus on:

- Mapping/showcasing local talent and technological capability. IPAs can greatly speed up investment decision-making by providing prospective investors with detailed, searchable ‘maps’ of local digital talent and innovation of potential interest to them (including innovative start-ups, digital businesses, technology firms, academic institutions, knowledge networks and so on).165 It saves investors the time and cost of this research, while powerfully showcasing local capability and differentiation. IPAs should then follow up such mappings with dedicated physical or virtual meetings (box 8) between showcased businesses/entrepreneurs and interested foreign direct investors.

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163 See https://the-ken.com/sea/story/what-legos-1b-carbon-neutral-factory-says-about-vietnams-solar-plants/?ref_sharecode=NjU0MDUzLTIzOTg5LTA5MDgwNDEx.
164 Ibid.
Similarly, IPAs should set up virtual meetings with target foreign direct investors in order to strategically engage with them early in the investment-decision process. These meetings should bring together all key decision-makers in a target company with relevant host country officials, sector experts, and prospective local partners and suppliers to give them a holistic picture of their investment destination and its potential value to their business. Video-conferencing has made this type of direct and simultaneous engagement between a variety of stakeholders possible for the first time, and IPAs should seize the opportunity (Feldberga and Dick, 2021).

- Showcasing the urban/investment locale. Where possible, IPAs should use digital technology to showcase principal tech cities and investment locations to prospective digital business investors, as Invest KL is doing in Malaysia, for example.\(^{166}\) Similarly, investors considering Shenzhen can do an online aerial tour,\(^{167}\) and those considering Viet Nam’s Nam Dinh Vu Industrial Park can now visit virtually for a 3D, unobstructed 360-degree views of its industrial plots, houses, and other facilities.\(^{168}\) Using such technologies, IPAs could give investors online tours of technology parks, digital innovation hubs, and other potential investment locations, to give them a ‘real world’ feel of potential project sites. Each tour should allow investors to zoom in on available plots, to understand assess location, size, cost, neighbours and proximity to transportation. Another strategy is to create a searchable database of investment opportunities for digital business, adapting from Invest India’s India Investment Grid, a repository of 15,146 investment opportunities in 22 sectors across the country, each described in detail.\(^{169}\)

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**Box 8  
Showcasing local digital talent to prospective investors virtually**

The Republic of Korea’s trade and investment promotion agency (KOTRA) has created a video-conferencing platform to showcase Korean entrepreneurs to potential global investors, partners and buyers. Using this platform, KOTRA runs a stream of virtual meetings for Korean entrepreneurs to ‘see and be seen’ by potential overseas collaborators, and even to negotiate, finalize deals and sign contracts with them. Its Global Jump 300 programme uses this platform to enable innovative Korean digital economy start-ups to access global markets, participate in global tech festivals, such as Collision Conference or Tech Crunch Disrupt, and to make virtual pitches to participating investors.

Source: Author, adapted from Invest Korea.

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166 See https://lokalocal.com/vr/investkl.
167 See YouTube, *Epic 4K Aerial Tour of Shenzen – China and the World’s Future City!* Available at https://www.youtube.com/watch?v=NZ1J848lULM.
168 See https://vr360.namdinhvu.com/.
169 See https://indiainvestmentgrid.gov.in/.
A simpler strategy is to harness interactive website tools to offer investors a detailed understanding of potential host locations, using photographs and text. Investors can click on a city of interest and open an information dossier about it, which typically includes economic, demographic, statistical and infrastructural information (including population, per capita income, local skills and wage levels, natural resource availability, Internet connectivity and transportation logistics). In addition to investment-relevant information, websites could give potential investors a realistic idea of what it would be like to live and set up business in a particular location, using descriptive photos or videos of its primary attractions from a nature or cultural perspective, its schools or universities, medical facilities, or its nightlife. Such websites could even provide a ‘relocation guide’ for entrepreneurs or businesses migrating to the city, with links to office space, rental consultants, salary comparator, and so on.

- IPAs and their Governments should create shared ‘plug and play’ facilities for digital business investors, including office space, state-of-the-art labs and equipment, such as the Plug and Play Tech Centres in China, India, Singapore and Hong Kong, China.170 Shared facilities save investors the time and cost of arranging or buying these for themselves. Intensifying global technology competition is compelling all firms to use highly sophisticated and expensive equipment even in basic operations – technologies that can become obsolete in as little as two to three years. This is especially the case in sectors that are going to drive digital economy growth during these next few years, including AR, VR and animation. Since much of this equipment is not required on a day-to-day basis, firms see economic sense in locating in a facility that enables equipment and cost sharing.

- More recently, many locations have begun to establish ‘accelerators’ to back promising tech entrepreneurs (including locally-invested foreign firms), especially in Big Data, additive manufacturing, artificial vision, cloud computing and robotics. Examples include the Startup SG Accelerator in Singapore and the Newchip-KOTRA accelerator in the Republic of Korea. In some cases, beneficiaries receive a stipend or start-up funding from the accelerator promoter who, in turn, receives a share in equity. This support includes co-working facilities – structured networking, advice and mentorship, and training in business planning, product development, investor pitching, commercialization and introductions to interested investors.

(f) Engage with investors through structured contexts, like industry conferences and exhibitions

Host countries should engage with target investors in structured contexts. Leading among these are sector-specific or digital economy conferences and exhibitions. Such events enable them to showcase specific national offerings and digital talent better, and to hear from innovative firms – both foreign and domestic. Such events are also a useful way to showcase promising local start-ups to digitalizing foreign direct investors looking for strategic tie-ups with digitally innovative firms.

For digital infrastructure this includes APEX conferences like the International Telecommunications Week,171 the Pacific

170 See https://www.plugandplaytechcenter.com/how-we-work/our-locations/.
171 See https://event.internationaltelecomswEEK.com/event/e807a337-d06c-4e37-baa5-00e55f004c42/websitePage:bbfd30d8-c44a-49e1-bd3b-1779895faba9.
Telecommunications Council,\textsuperscript{172} and the Mobile World Congress’ Barcelona\textsuperscript{173} and Shanghai\textsuperscript{174} chapters. Such conferences draw an extensive array of digital infrastructure and digital economy investors, technological experts, government officials, and non-governmental organizations to present and discuss new trends and technologies and explore investment opportunities. Hong Kong, China’s and Singapore’s start-up conferences,\textsuperscript{175} for instance, make it a point to encourage registration, from foreign ‘brick-and-mortar’ firms, to attract digital adoption FDI.

Using each conference’s virtual platform, IPAs can pre-schedule meetings with target investors. They can also arrange conference booths and speaking slots for their countries’ leading digital economy experts and investment officials and should have a compelling story to tell.

\textbf{(g) Proactively publish investment opportunities}

IPAs should proactively publicize all digital economy investment opportunities in their countries, going beyond the practice of merely posting tenders/notifications on government websites. IPAs should systematically provide this information to target firms and organize conferences, customized briefings and in-country visits. These could be virtual, like Invest India’s digital conference to showcase Smart City investment opportunities\textsuperscript{176} or IDC’s digital Cloud Roadshow.\textsuperscript{177}

They should also reach out to banks and investment funds who can be a trusted intermediary with target investors. Similarly, IPAs should strategically engage with location advisors, lawyers and other consultants that digital infrastructure firms refer to for advice on overseas investments.

IPAs should study target investors’ supply chains and reach out to their principal suppliers to invest. Digital infrastructure firms will feel more confident about investing in new locations if their key suppliers are close at hand. It is also wise to target a mix of firms, large, mid-size and small. To ensure healthy competition, each digital infrastructure subsector should have three to four operators. Innovative small firms are also responsible for many of the technological breakthroughs propelling digital infrastructure advancement.

\textbf{(h) Facilitate partnerships and collaborations}

Given global firms’ strategic interest in partnering with globally competitive digital innovators, IPAs must become thoroughly familiar with the range of digital innovation occurring locally across sectors and be able to introduce investors to prospective partners, even from other disciplines. This might require some organizational convergence and restructuring (box 9).

City alliances and partnerships can also be a powerful tool in attracting FDI in digital business, whether through bilateral sister city

\textsuperscript{172} For more information, see https://www.ptc.org/council/about/.
\textsuperscript{173} For more information, see https://www.mwcbarcelona.com.
\textsuperscript{174} For more information, see https://www.mwcshanghai.com.
\textsuperscript{175} For Hong Kong, China see: https://www.startmeup.hk/startmeuphk-festival-2022/. For Singapore, see https://www.startups.gov.sg/events/.
\textsuperscript{176} For more information, see https://pib.gov.in/PressReleaseframePage.aspx?PRID=1791622.
\textsuperscript{177} For more information, see https://www.idc.com/getdoc.jsp?containerId=prMETA47847421.
arrangements – such as between Bangalore and San Francisco, and Busan and Montreal – through participation in international city alliances, such as the G20 Global Smart Cities Alliance. In both cases, firms from one member city can draw on the network of another when investing there, greatly facilitating engagement and investment decision-making with potential partners and partners as well as local authorities and communities. Partner cities draw more FDI than other cities in each country, and companies tend to invest more in markets with a larger number of sister city arrangements with their home country (Hu, Nataraj and Delios, 2021).

For the same reason, digitalizing investors find much value in continued structured interaction with local innovators, sector associations and other relevant businesses and institutions, even after their investments are up and running. It helps to keep investors’ ears to the ground on technology and market developments as well as nurture new digital partnership that are of synergistic benefit to both parties. IPAs and business associations could organize an ongoing series of structured

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178 For more information, see https://sfbangalore.org/.
179 For more information, see https://www.busan.go.kr/eng/SisterCities.
180 For more information, see https://globalsmartcitiesalliance.org/.
meetings and interactions between digitalizing foreign direct investors, innovative digital start-ups, research institutions and local business. Singapore’s Big Business, Tech & Entrepreneur Professional Networking Soiree is an example.181

(i) Support digitalization though supporting smart readiness assessments

Host countries should support the digital transformation of foreign direct investment projects. Guidebook interviewees said such support is much valued by foreign direct investors and encourages new investment as well as re-investment and expansion. From the perspective of both foreign direct investor and host country, government support for digital transformation helps to keep overseas operations competitive in the face of intensifying global digital change, and wards off obsolescence and potential closure. IPAs can support the digital transformation of foreign direct investment projects through, for instance, smart readiness assessments (box 10). Both Malaysia and Singapore also offer information, advice, investment application service and establishment facilitation services to foreign direct investors setting up digitalizing businesses (ASEAN, 2021). Some, such as Indonesia, have instituted annual awards to recognize both foreign and domestic firms that have made the most progress on digital transformation (ASEAN, 2021).

### Box 10: Helping foreign direct investors in manufacturing transition to Industry 4.0

The Smart Industry Readiness Index (SIRI) is the world’s first Industry 4.0 digital maturity assessment for manufacturers. Launched in 2017 by Singapore’s Economic Development Board (EDB), industry and academic experts, and global technology and consultancy firms invested in Singapore, SIRI presents Singapore-based manufacturers (of all nationalities and sizes) with a framework of indices by which to evaluate the current state of their manufacturing facilities and readiness for ‘smart manufacturing’. By identifying gaps and benchmarking themselves against advancing industry best practice, firms can identify high-impact areas for improvement to move up SIRI’s six progressive bands of Industry 4.0 digital maturity. The accompanying Prioritization Matrix enables companies to identify high-priority SIRI Dimensions that would deliver the greatest impact to their organization.

In 2018, the Government of Singapore funded SIRI assessments for 300 foreign and domestic manufacturing firms to kick-start and support their Industry 4.0 transformation. In 2019, the Government launched a training and certification programme for qualified assessors to further scale the use of the Index by helping more companies (foreign and domestic) to use the Index to evaluate their Singapore operations and identify priority areas for improvement. It also initiated close collaboration with local chambers of commerce to deepen support and guidance to transforming business across sectors.

This programme has been of such benefit to global firms invested in Singapore that, in 2020, the World Economic Forum partnered with EDB to globally deploy SIRI as an industry standard for Industry 4.0 transformation.


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(j) Engage in proactive investment facilitation and aftercare

Offering investment facilitation and aftercare services is key to retaining digital economy investments. In 2018, 41 per cent of all FDI in Asia came through reinvested earnings, emphasizing the importance of continued facilitation and aftercare services of the IPAs to investors. The services that investors will need will differ according to the sector in the digital economy in which the investment occurs. Such services are perhaps most obvious and needed for investment in digital infrastructure.

After a digital infrastructure investor has decided to invest, the local IPA must work closely with the ministry of telecommunications to facilitate the investment process. Most important is to help the investor obtain all licences, permits and approvals in a timely manner so that project construction and operation can begin on schedule. More generally, IPAs should continually collaborate with all concerned ministries and government departments to simplify, modernize and digitize digital infrastructure-related licences, permits and approvals. According to ITU simulations using 2008-2019 data from 145 countries (ITU, 2021e), halving the time required to obtain the permits, licences and approvals for digital infrastructure and telecommunications services is linked to a 17 per cent rise in total national annual capital investments in fixed and mobile broadband by foreign and domestic firms.

IPAs should also support digital infrastructure investors by remaining in regular touch with ports and customs authorities to expedite equipment imports. In the developing world, most of the equipment for digital infrastructure projects must be imported since it is not locally available. Protracted delays in clearing this equipment through customs can add considerably to project costs. The same is the case with connectivity devices. In this context, IPAs should regularly ensure that the product codes/equipment registries used by local port authorities to classify and approve incoming digital infrastructure equipment keeps up with the latest international standards. Mismatches can cause such equipment to unnecessarily get stuck in customs.

Even once projects are operational, it is imperative for IPAs to systematically engage with investors to identify and resolve challenges as well as solicit ongoing feedback. Foreign direct investors tend to downsize or withdraw investments in/from host locations which pose too many unresolved difficulties, as Telenor’s exit from Myanmar highlights. Contrarily, systematic interaction and support by senior-most management can prompt investors to expand, upgrade and diversify operations, and to attract other investors, as Malaysia’s experience shows (box 11). In fact, reinvestment and expansion by foreign digital infrastructure investors can be a potent tool in developing the local digital economy and propelling it up the value chain, as Malaysia’s experience highlights.

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184 Ibid.
185 The Irrawaddy, Myanmar Junta Approves Sale of Telenor Subsidiary to Lebanon’s M1.
Malaysia used reinvestment and expansion by foreign firms – and strategically evolving investor incentives – to create a successful export-oriented digital infrastructure-related electronics industry which, in turn, drove its emergence as a major Asian digital economy. Foreign direct investors accounted for some 90 per cent of all investment in this industry from 1970 to 2019.

Kick-starting export-oriented electronics manufacturing: In 1972, the provincial government of Penang made dedicated pitches to the world’s leading electronics firms and persuaded eight of them to invest. It offered these investors an eight-year income tax holiday, investment tax credits of up to 40 per cent, tariff-free imports, export incentives, and waived the requirement that these firms employ indigenous Malaysians. It also created a network of free trade zones, manufacturing warehouses and related infrastructure. Most importantly, Penang’s Chief Minister met weekly with the local CEOs of these eight foreign firms to understand and resolve problems.

As a result of these efforts, a booming, FDI-driven, export-oriented electronics industry was born within a few years, centred on labour-intensive, low-skilled component manufacturing or parts assembly and product testing.

Industry expansion and evolution: By the late 1980s, these zones had developed a technological ecosystem and skilled workforce that drew a second wave of foreign direct investors, mainly from China; Japan; the Republic of Korea; and, Singapore. Generous investment incentives were a further attraction, including a 100 per cent investment tax allowance for qualifying capital expenditures incurred within five years of a project being approved. The Government also invested in technological upgrading, economic clustering, skills development, and local linkages, and set up a venture capital organization to invest in promising firms that were often set up by former employees of the foreign firms operating in the export-oriented zones.

Digital economy innovation: In the 1990s, Penang began to promote more technologically sophisticated manufacturing that propelled the emergence of its digital economy. It phased out incentives to labour-intensive projects that were not located in backward areas. It focused investment promotion on high-value-added engineering and design relating to the digital economy, particularly in semiconductor manufacturing, R&D and the design of integrated circuits. Customized incentives for innovation, rather than employment, were offered to strategic high-tech investors. Foreign firms could also avail of research grants for high-value digital economy innovation. Rules on the import of foreign professionals were relaxed. Finally, foreign firms could help shape the content of (and select participants for) the government training programmes set up to supply them with workers and vendors.

As a direct result of these policies, global digital connectivity device firms moved wafer fabrication, IC design and R&D operations to Malaysia, from where they registered a rising number of international patents.


These firms included Intel, Advanced Micro Devices (AMD), National Semiconductor (now Fairchild Semiconductor), Hewlett Packard and Hitachi Semiconductor.
Facilitating investor entry and establishment

Many firms interviewed for this Guidebook pointed to Singapore’s proactive, holistic assistance to foreign digital business investors as an example for IPAs seeking to boost investments from digital business. In their experience, the highlights of Singapore’s investment-enabling approach are:

- Project planning. The IPA organizes and chairs an inter-departmental meeting in which the investor presents its project to a cross-sector team of relevant government officials. The group collectively identifies potential regulatory and other challenges, and decides on a course of action to smooth project rollout and operation.
- Investment planning. The IPA makes available a roster of reputed local financial, tax and legal planners, whom prospective investors can consult when planning and structuring investments.
- Assistance with entry formalities. The IPA (or contract staff) guide and assist investors with entry formalities, such as company and tax registration, bank account opening and licence application.
- In-house programmes to support digital start-up. In addition, the IPA offers a plethora of in-house programmes to support growth and internationalization by digital start-ups, including those with up to 70 per cent foreign ownership. The StartupSG Infrastructure programme offers shared office space, technology incubators, access to venture capital, business mentorship and development experts. The StartupSG Loan and StartupSG Equity programmes offer government loans for working capital, equipment, factory and trade financing, and government co-investment with third-party investors in promising start-ups. The Startup SG Accelerator helps domestic and foreign incubators and accelerators to set up services for high growth Singapore-registered digital start-ups.
- Talent. StartupSG and the Economic Development Board also support foreign digital start-ups and digital businesses source a variety of talent. The T-Up programme deputes government scientists and research engineers to help innovative start-ups with R&D for two years. The Global Ready Talent programme helps to internationalizing start-ups develop a talent pipeline by subsidizing the salaries of Singaporean interns hired in local and overseas operations. The Global Tech Talent Alliance offers internationalizing start-ups a network of overseas partners who can help build local teams for overseas markets. EDB’s Tech@SG programme enables more established digital businesses to import 10 foreign employees, for two to five years, to start core operations in Singapore, and its Training Grant for Company subsidizes capacity-building for employees in using novel technologies. Both organizations also provide other salary subsidies for local digital talent.
- R&D and Proprietary Technology. Both organizations incentivize R&D that results in proprietary technologies, and help firms to register and commercialize their intellectual property.


Box 12

For more information, see https://www.startupsg.gov.sg/programmes.
Ibid.
Ibid.
Ibid.
For more information, see https://www.startupsg.gov.sg/programmes/4898/startup-sg-talent/t-up.
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(j) Target home country internationalization programmes

In addition, IPAs can engage with investors through home country internationalization support programmes. This would involve the IPA partnering with home country programmes that support globalization/international commercialization by digital start-ups to attract investment from innovative new firms. For example, Singapore’s Global Innovation Alliance\textsuperscript{194} (GIA) has offices in 15 innovation hubs globally,\textsuperscript{195} and plans to scale-up to 25 hubs in the next few years. In each location, it partners with a reputed venture capital fund\textsuperscript{196} to identify local investment opportunities for Singaporean tech start-ups. Each foreign venture capital partner selects the Singaporean start-ups it considers most likely to succeed in its location, and then actively mentors and support them. The Government of Thailand’s Innovation Diplomacy initiative\textsuperscript{197} is another example. Its purpose is to study as well as strategically reach out to, and partner with innovation organizations worldwide, in a push to globally commercialize Thai innovation by building an international network of local partners, decision-makers, specialized events and investment matchmaking (while also promoting Thailand as a high-tech investment location).

5.3. Conclusion

This chapter has outlined policies and strategies that prospective host economies could use to attract FDI into each of the three components of the digital economy, i.e., digital infrastructure, digital adoption and digital business. It draws on the experience of Asia’s leading digital economies, and from consultations with digital economy investors in the Asia-Pacific, FDI experts and investment promotion officials.

The crucial first step is to create a stable, modern regulatory framework that balances the needs of investors, consumers, and the host economy. 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. Empirical research finds these factors heightening digital infrastructure investments by foreign and domestic firms. 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, data security and privacy, intellectual property protection and data localization.

In addition, it is crucial for host countries to relax FDI restrictions in various components of their emerging digital economies. This includes telecommunications, IT and media, and a range of physical sectors (transportation, financial services, health and agriculture, for example) in which digital businesses are innovating novel technologies and offerings, and traditional businesses are adopting them.

To attract foreign direct investors in digital infrastructure, IPAs must present them with interesting investment opportunities and


\textsuperscript{195} These hubs are Beijing, Shanghai, Shenzhen, Suzhou, Paris, Berlin, Munich, Bangalore, Jakarta, Tokyo, Manila, Bangkok, London, San Francisco and Ho Chi Mihn City.

\textsuperscript{196} Local partners include 500 Startups in San Francisco and Anthill Ventures in Bangalore, for example.

\textsuperscript{197} For more information, see https://www.nia.or.th/diplomacy#:~:text=National%20Innovation%20Agency%20(Public%20Organization,as%20to%20promote%20the%20image.
a clear sense of the returns they are likely to make in the near-to-midterm. To attract foreign direct investors in digital business 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 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 to continue to engage closely with them in order 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.


REFERENCES


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