COVID-19 and disruption of the digital economy; evidence from low and middle-income countries

Digital Pathways Paper Series

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BLAVATNIK SCHOOL OF GOVERNMENT
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Digital Pathways at Oxford

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This paper is part of a series of papers on technology policy and regulation, bringing together evidence, ideas and novel research on the strengths and weaknesses of emerging practice in developing nations. The views and positions expressed in this paper are those of the author and do not represent the University of Oxford.

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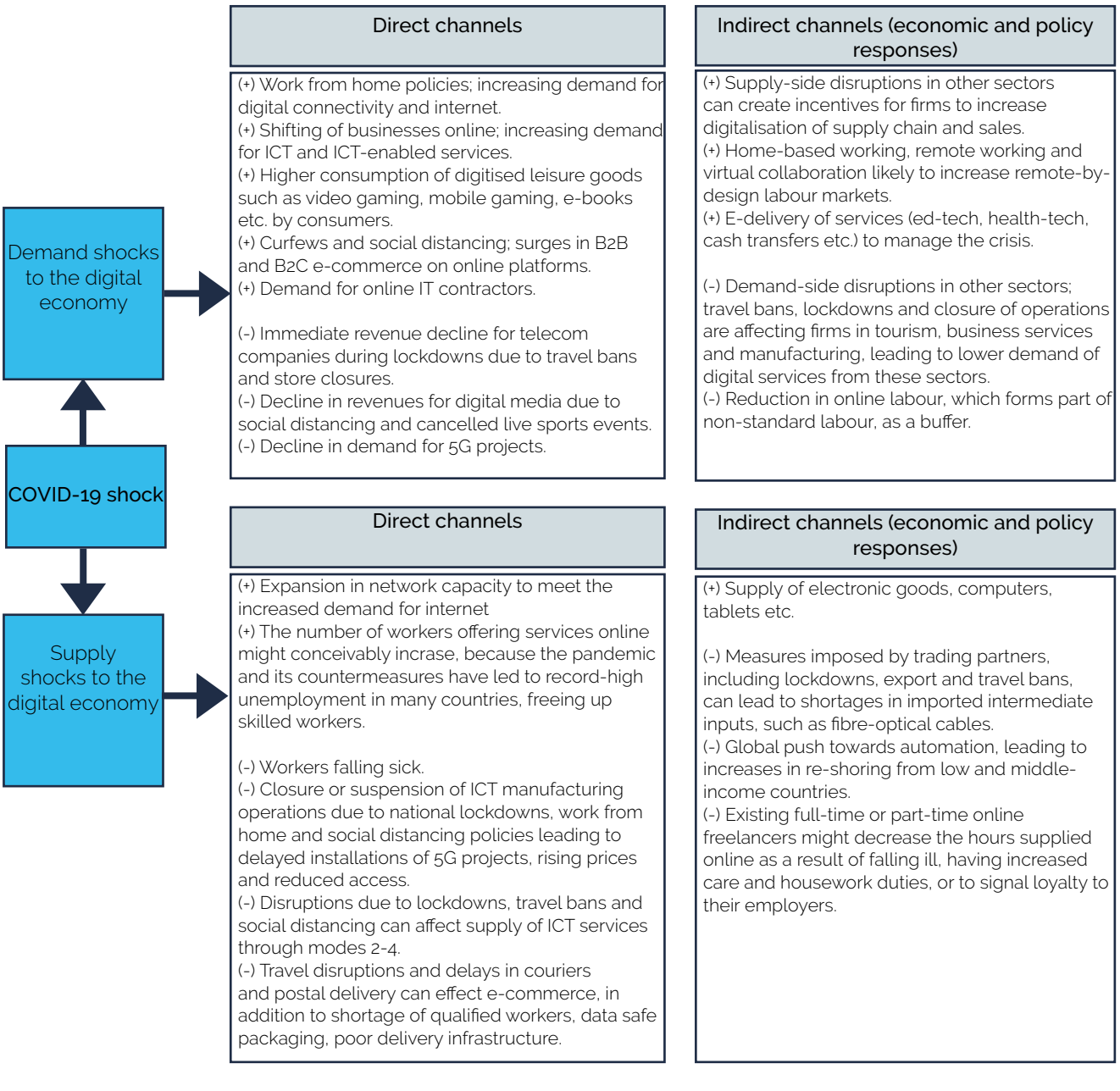
Executive Summary

The COVID-19 pandemic is disrupting the digital economy through demand and supply-side shocks, with the digital economy in turn playing a key role in crisis recovery. New analysis in this paper suggests that digitalisation can be a key pathway for mitigating economic losses from the pandemic, but this will require inclusive and targeted digital transformation policies in low and middle-income countries. If this is not done, the pandemic will exacerbate existing digital and economic divides across and within economies.

This study attempts to understand how the pandemic is affecting the digital economy, and how digital transformation can be leveraged for an inclusive recovery. It develops a framework for understanding the first and second-order effects to the digital economy and then applies this framework to low and middle-income countries, focusing analysis around four segments of the digital economy; a) digital infrastructure; b) ICT and ICT-enabled services; c) e-commerce; and d) online work. The effects of the pandemic on the digital economy in low and middle-income countries are summarised in Figure A.

Figure A: COVID-19; demand and supply shocks to the digital economy



Digital infrastructure is witnessing a positive demand shock due to business shifting online and consumers working from home. This shock is however expected to be lower in low and middle-income countries, where the informal sector constitutes a large share of economic activities, thereby limiting the enforcement of social distancing and work from home arrangements. Moreover, increased demand for internet access in LICs and MICs is largely met through degradation in overall broadband speed, which can in fact have a negative impact on GDP growth. Average broadband speed declined during the lockdown by more than 20% in several African and Asian countries. On the supply side, travel bans, lockdowns and social distancing policies have disrupted ICT manufacturing segments, with declining imports of optical fibre cable and other material inputs for Brazil, South Africa, Chile and Thailand between Jan-June 2020. These supply-side shocks have a higher effect on LICs, and MICs as compared to HICs, since the latter group has higher domestic capability of substituting imports and also has higher robot density in manufacturing i.e. is more automated.

The pandemic has increased the demand for ICT and ICT enabled services, particularly for cloud services and data hosting services. Mobile gaming, VFX and digital animation are also emergingas services with significant growth potential. However, access to and usage of cloud and data hosting services in emerging markets currently tends to rely on data centres outside their local markets, with limited domestic capabilities. Trade in digitisable goods and digital services also remains low in scale. Compared to Q1 of 2019, exports of digitisable goods in Q2 of 2020 have in fact declined in Thailand, Brazil, Kenya and Mozambique, while imports have increased in Thailand, South Africa and Brazil. Supply-side disruptions to ICT and ICT-enabled services are limited, since most of these services can be delivered online (Mode 1) in work-from-home scenarios and are therefore more resilient distancing measures and travel bans. But the share of ICT and ICT-enabled services in total services exports remains low; computer and related services account for less than 10% of services exports in Cambodia, Ethiopia, Mozambique, Zambia, Nigeria, Tanzania and Rwanda, while ICT-enabled services exports account for less than 20% of services exports in Cambodia, Namibia, Nigeria, Uganda, and Mexico.

Firms across sectors are looking to leverage new opportunities during the pandemic through e-commerce. New evidence in the paper using World Bank's (2020) 'Impact of COVID-19 survey' data from 1182 firms across four African countries- Niger, Togo, Zambia, Zimbabwe- shows that 266 firms (22.50%) of the sample report adopting a digital response to the pandemic. Over 70% of the firms with digital response (in manufacturing, retail and other services) report having adjusted or converted production, compared to roughly 40% of firms with no digital response, and over 50%of firms with a digital response report having started or increased delivery of goods and services, compared to less than 25% of firms with no digital response. A significantly higher share of firms with a digital response in manufacturing and retail sectors report witnessing an increase in demand for their goods and services and a higher share export over 10% of sales directly compared to firms with no digital response to the pandemic. Interestingly, 6.77% of firms in retail sector and 4% of firms in other services sectors report an increase in monthly sales compared to a year ago, with 3.5% of retail firms also reporting a permanent increase in employees. But e-commerce revenues remain relatively small in Africa, with physical retailers in low and middle-income countries faring better than pure-play e-commerce retailers (or e-tailers), which sell goods and services online through an online channel with no physical stores.

However, there exists significant differences across regions in B2C e-commerce, with Africa lagging behind the rest of the world, particularly in terms of delivery infrastructure. Supply-side shocks to e-commerce during the pandemic are making things worse; shortages of delivery workers due to sickness, delays in parcels due to cargo, air and transport disruptions, increasing air freight prices due to cancellation of flights etc. On the demand side as well, there exists significant differences in online buying across income status, gender, age and education. On average, 24% of the world's population is engaged in online buying, but only 2-4% of the population in low and lower middle-income countries is buying online. While 57% of females in high-income countries are engaged in online buying, it falls to 1% in low-income countries. Similarly, over 60% of the youth in high-income countries is buying online, but this falls down to 44% in upper-middle income countries, 7% in lower middle-income countries and 3% in low-income countries.

By mid-March 2020, when COVID-19 had become a pandemic, the Online Labour Index was in decline, in comparison to 2018 and 2019. It recovered in April 2020, and surpassed previous levels, but has been declining since July. The effect on online labour will ultimately depend on the type of online work being performed; demand in creative and multimedia or sales and marketing support has shrunk but requests for projects in the software development and technology category remain largely unaffected. For Africa, the OLI reports a one-point increase in online work contracting since the beginning of the crisis.

Levering digital transformation for inclusive recovery is key; analysis in the paper suggests that countries which had the highest internet access in 2019, were more stringent in policy responses to COVID-19 in 2020, potentially highlighting the important role that digital readiness has played in responding to the crisis. Digital access is the first step for firms to be able to shift their business online, implement work from home strategies and for government to offer Govtech, HealthTech and EdTech solutions.

Responsive policies are needed to close the digital divide between low and middle-income countries and high-income countries and to expand digital connectivity to marginalised sections of the society through allocation of emergency spectrum and lowering of fee for spectrum. The rise in e-commerce needs to be managed inclusively and appropriately, requiring development of appropriate regulatory frameworks and policies on privacy, data, online dispute resolution, cyber-crime etc. The use of big data in the battle against COVID-19—particularly the use of detailed mobile phone data to track and monitor the pandemic—has further spurred major privacy concerns. As per the UNCTAD cyberlaw tracker 2020, in Africa, 72% of countries have a law against cyber-crime; 61% of countries have an e- transaction law, but only 46% have a consumer protection law; and only 50% of the countries have a privacy and data protection law. Taxations and competition laws need to be updated in addition to increased focus on digital skills development.

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1. Introduction

The COVID-19 pandemic is causing unprecedented disruptions across global value chains, with manufacturing and some services subsectors – particularly transport and travel, tourism, aviation and hospitality - hit hard. The World Economic Outlook forecast in June 2020 projects a fall in global gross domestic product of 4.9% in 2020 (IMF, 2020). Economic growth in the group of emerging market and developing economies is expected to fall by 3% in 2020, with growth among low-income developing countries (barring a few large frontier economies) projected to contract by 2.2% in 2020 (IMF, 2020). The contraction of GDP is being realized through the combined effects of supply side and demand side shocks (Baldwin and Weder di Mauro 2020). Supply has been affected directly through the closure and suspension of operations across multiple activities, leading to redundancies and suspensions, which have directly affected demand through dampening income expectations. The lockdowns have directly affected many services, such as hospitality and retail services, with a knock-on effect on their domestic and foreign suppliers. On the demand side, people staying at home and not going to movie theatres, restaurants, travelling etc. capture peoples' falling willingness or ability to purchases good and services during the pandemic. There appears to be no consensus on which of the two shocks are dominating in the crisis; using firm-level data from Germany, Balleer et al. (2020) find dominance of the demand-side for price setting behaviour, while Brinca et al. (2020) use U.S. data to conclude that labour supply-shocks account for most of the fall in work hours in the country.

In contrast to other sectors, the digital economy seems to be faring better and playing a critical role in crisis response and recovery. This is apparent across several sub-segments of the digital economy; there is rising demand for e-commerce, IT and IT-enabled services, remote working, telemedicine, online education, adoption of mobile money etc. COVID-19 has also accelerated the urgency for adaptability and transformation across industry structures and business models, with an estimated 70% of new value being created through digital platform business models over the next decade (WEF, 2020). Even manufacturing firms are looking towards increasing e-commerce to expand market access during the crisis; in Kenya, for instance, 30% of the members in the Kenya Association of Manufacturers (KAM) surveyed are aiming to increase online capabilities as a response to the crisis (KAM and KPMG, 2020). On the other hand, the digital economy has been hit by reduction in manufacturing of telecommunication devices and delays in implementation of 5G projects, including due to reduction of manufacturing capabilities during the crisis in Wuhan- one of the largest suppliers of fibre-optic cables in the world.

As new parts of the digital economy are rapidly accelerating, opportunities are being created through lowering the cost of, and facilitating, trade, reducing market entry barriers (including non-tariff barriers), enabling higher market access through e-commerce, supporting efficiency improvements, enabling movement into higher value-added products in the agriculture and services sectors, and raising overall export competitiveness. However, there is a persistent global digital divide; low and middle-income countries continue to lag behind high-income economies in several aspects of digitalisation, from internet access to automation, and also benefit less from these digital technologies due to poorer overall complementary infrastructure and skills. There is thus a risk of growing and/ or new inequalities in the digital economy. Given this, the study attempts to understand how the digital economy can be leveraged to foster inclusive development in low

and middle-income countries and boost economic resilience during the ongoing pandemic. This is done by examining how the pandemic and other external factors and policy settings are affecting different segments of the digital economy, in addition to analysing appropriate policies to leverage benefits of digitalization, including in responding to the crisis and eventual recovery.

Section 2 provides a framework for understanding channels the effects of the pandemic on the digital economy. The sections thereafter apply the framework to low and middle-income countries across four segments of the digital economy; a) digital infrastructure and ICT goods (Section 3); b) ICT and ICT-enabled services (Section 4); c) E-commerce (Section 5); and d) online work (Section 6). Section 7 provides policy implications with Section 8 concluding the study.

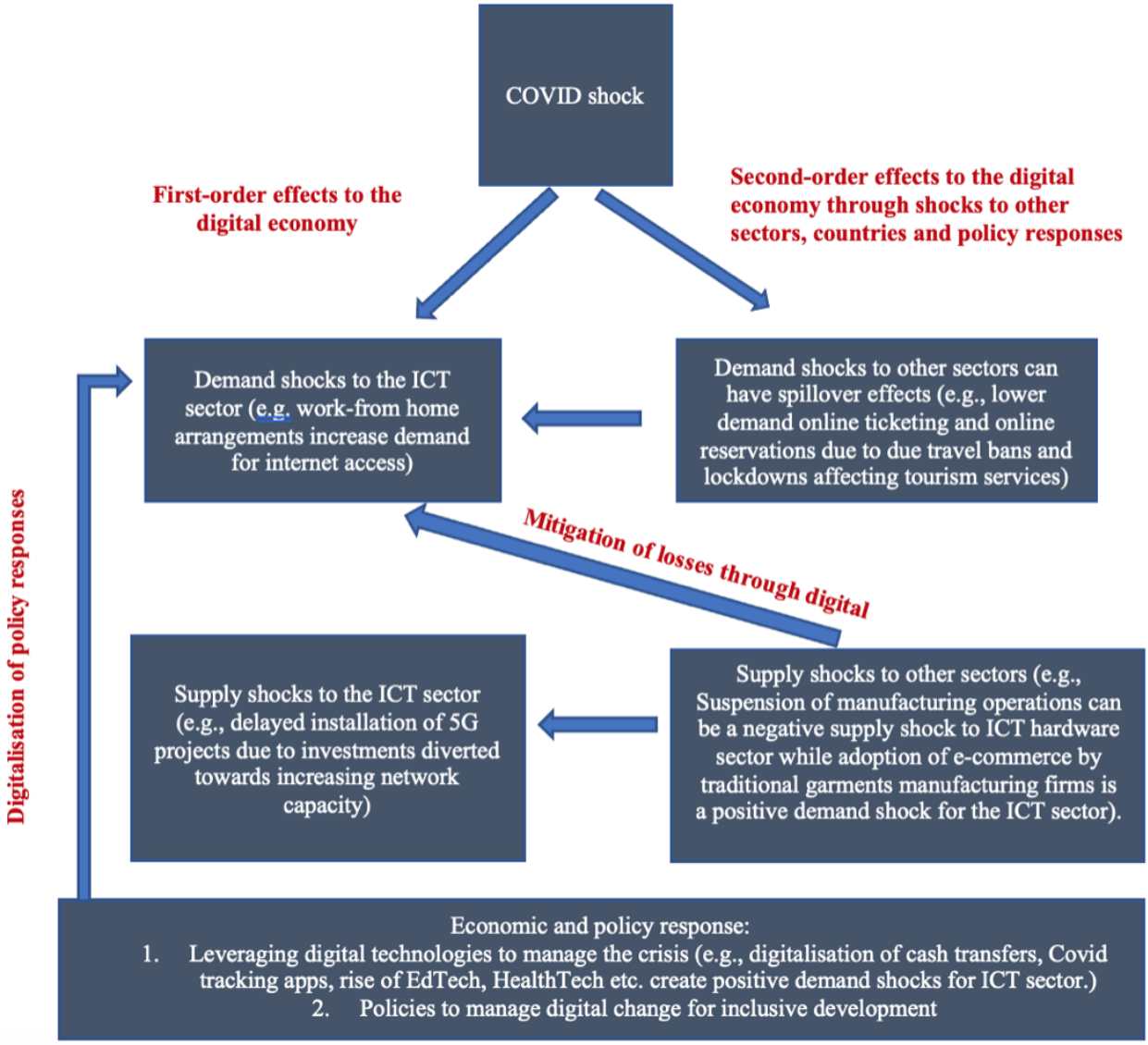
2. COVID-19 and the digital economy; a framework

This section provides a framework for understanding the supply and demand side pathways through which the pandemic is affecting the digital economy - see Figure 1. In this framework, the effects of the pandemic to the digital economy can be a) direct, or first-order affects to the digital economy, or b) indirect effects, (second-order effects) which arise as a result of economic and policy responses to the pandemic. Consider direct effects; on the demand-side, work from home arrangements, social distancing and businesses shifting online can increase the demand for digital connectivity and digital services. On the supply side, this can lead to increasing investment in maintaining and building network capacity but potentially at the cost of delays in deployment of more advanced technologies such as 5G.

Indirect shocks to the digital economy can arise from demand and supply-side disruptions in other sectors of the economy as well as through policy responses by governments. Falling demand in other sectors can have a negative spillover effect on the demand of digital technologies. For instance, empirical analysis undertaken in Liew (2020) suggests that the lockdown in Wuhan exerted a significant adverse effect on Booking Holdings Inc., Expedia Group and Trip.com Group - three biggest online travel companies, offering services of air ticketing, online hotel reservations etc. Similarly, in some cases, supply-side shocks in other sectors can create positive demand shocks in the digital economy. For instance, traditional garments manufacturing firms starting or increasing their online business activities to increase resilience to the crisis will create a positive indirect demand shock for the digital economy. Likewise, closure of schools and re-direction of medical sources have disrupted the supply of education and health services across countries, with governments increasingly turning to ed-tech and health-tech solutions, contributing to the increased demand in the digital economy. On the supply-side, indirect effects include closure or suspension of ICT hardware manufacturing operations which can result in lower access to ICT hardware and equipment, higher prices and delayed digital projects, and travel bans and lockdowns in trading partners which can result in shortage of imported materials.

In the latter sections, we apply this framework to low and middle-income countries. Analysis is presented for the four segments of the digital economy; a) digital infrastructure (telecommunication networks, ICT goods etc.); b) ICT services (e.g. data processing services, cloud services etc.) and ICT-enabled services (e.g. business and financial services); c) e-commerce (business-to-business and business-to-consumers); and d) online labour).

Figure 1: First and second-order effects of COVID-19 on the digital economy



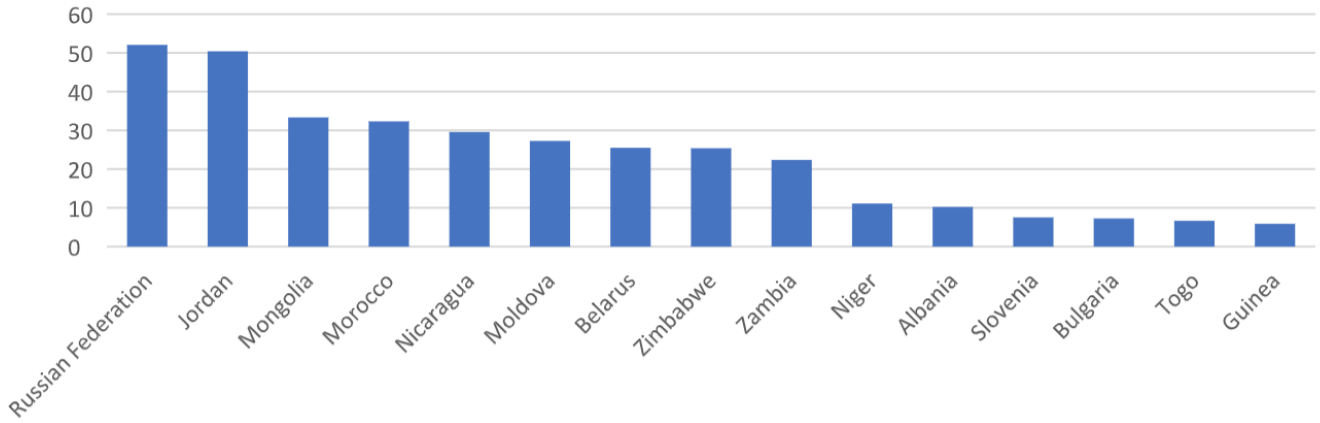
Source: Authors (2020)

3. COVID-19 and digital infrastructure

A key component of digital infrastructure is telecommunication networks, which includes a) international networks supported by submarine cables, fibre-optic or microwave terrestrial networks, and satellite communications to maintain a country's connectivity with rest of the world; b) domestic networks, supported by fibre-optic, microwave, or satellite links connecting urban centres; and c) networks for 'last mile' users, which rely on copper wires, or fibre-optic, cable modem links and wireless networks (ITU, 2020).

Policies adopted across countries to curtail the spread of COVID-19 - such as lockdowns, travel bans and work-from-home arrangements have led to a spike in telecommunication network usage. Internet traffic has increased by roughly 30% (ibid), with the use of communication apps such as WhatsApp having doubled (USwitch, 2020), and daily usage of some video streaming services increasing by 20 times. As per MOBILE world live (2020), Thailand has reported a growth of 828% and 215% in the number of users of Zoom and Skype respectively, while in South Africa, the Vodacom Group recorded a rise of 40% in data traffic. Overall, there has been a shift from enterprise to residential access, leading to rising demand of access through fixed broadband. Supply- side disruptions to other sectors have also contributed to positive demand shock in the digital economy (indirect channel). With closure and suspension of manufacturing operations and travels bans, firms in other sectors are likely to use digitalisation as a way of mitigating some of the economic losses from traditional sales. This is evident from Figure 2, which shows that over 20% of manufacturing firms surveyed in Russian Federation, Jordan, Morocco, Zimbabwe and Zambia have increased or started online business activity since the pandemic, contributing to the increased demand in the digital economy.

Figure 2: Digital response adopted by manufacturing firms, (% of firms)



WBES (2020) Impact of COVID-19 Survey

High-income countries are however likely to benefit more from positive demand shocks; they are more advanced in terms of development and use of digital economy, with better infrastructure, higher access to fixed network technologies, larger capacity and more robust networks to deal with the surge in demand for digital infrastructure and rising internet traffic as a result of the pandemic.[1] For the case of U.S., Brinca et al. (2020) confirm that the American information sector has witnessed

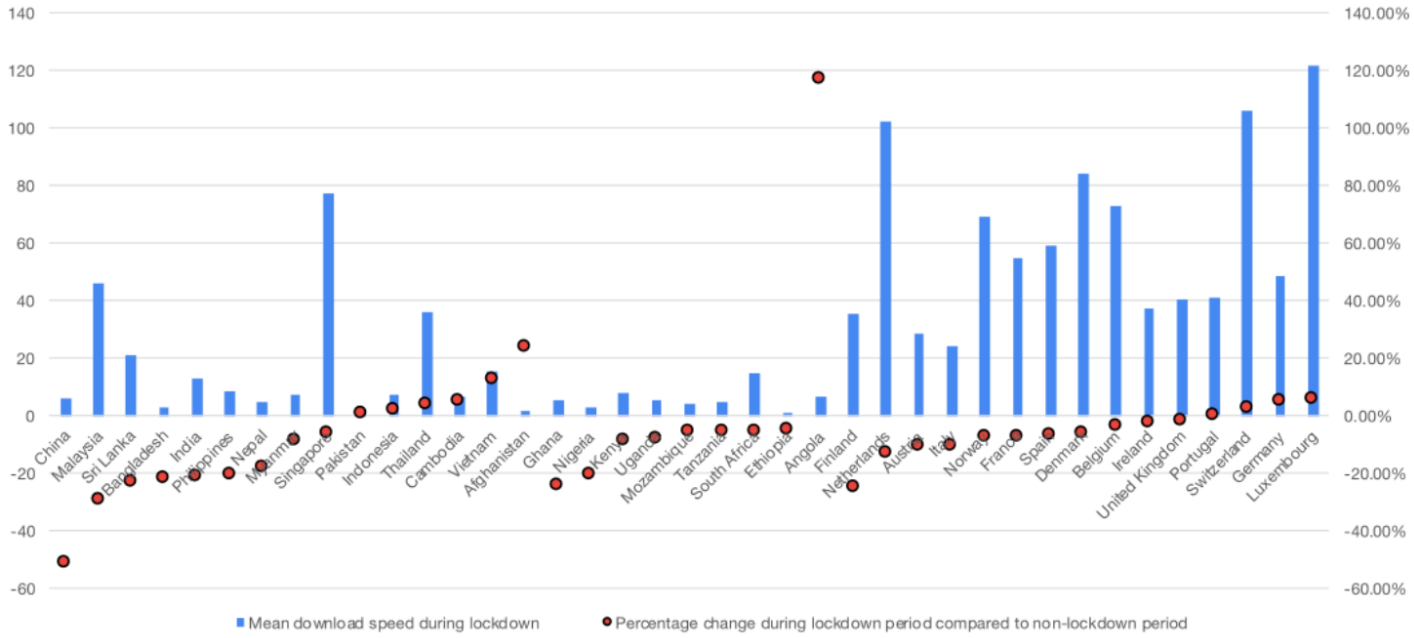
[1] https://www.ifc.org/wps/wcm/connect/8f9237d2-eceb-433f-a2d0-300907808722/EMCompass_Note_83-for+web.pdf?MOD=AJPERES&CVID=n7M5wS.

a positive demand shock, potentially due to increased interest of firms in telework software and arrangements. In comparison, low and middle-income countries are less exposed to demand shocks, and also experience a lower impact of these shocks. The informal sector constitutes a larger share of economic activities- for instance, 86% in Africa and 68% in Asia-Pacific- limiting the enforcement of social distancing and work-from-home models, potentially leading to smaller increases in demand for internet and other technologies compared to high income countries (IFC, 2020). These countries are also in process of developing their digital infrastructure and rank low on overall digital-readiness, digital skills and overall infrastructure. They tend to share broadband infrastructure, which makes it more sensitive to surges in demand, implying that surges in internet demand is likely to be met through overall lower broadband speeds. This has been evident in the case of Nigeria; as per the Nigerian Communication Commission, Nigeria gained 2.5 million subscribers during the lockdown in April 2020, with total number of internet users hitting 143.3 million as of June 2020 (Paul, 2020). However, data from Cable.co.uk (2020), shows that the average speed of the Internet in Nigeria declined by 20.8% during the lockdown. With the exception of a few countries,[2] majority of Asian and African economies have fared badly in terms of average download speed and changes during the lockdown (Figure 3).

Important development considerations arise from this; the pressure on digital infrastructure development in low and middle-income countries to expand digital connectivity during the pandemic can ultimately lead to a degradation of internet quality and affordability, further leading to slow growth of access to 5G for businesses. A number of studies have linked higher broadband speed to increases in GDP and productivity (see Katz and Callorda, 2019; Carew et al, 2018), with recent evidence indicating that countries with the most-developed broadband infrastructures are able, at least partially, to offset the negative effects of the pandemic (ITU, 2020). The reverse also holds a valid scenario; decreases in broadband speed can have an adverse impact on GDP, potentially contributing to the 'slow-down' in convergence, noted between SSA countries and the rest of the world in Banga and te Velde (2018).

[2] According to ITU (2020), countries with a higher penetration of ultra-fast broadband infrastructure - such as fibre optics - appear to be handling better the increase in traffic.

Figure 3: Internet performance during lockdown, 2020



Source: Authors (2020). Data from www.cable.co.uk. *Note: Download speed is in Mbps. Left hand-side vertical access represents download speed in Mbps. Right-hand side vertical access represents percentage change.*

On the supply side, digital infrastructure development can be directly and adversely affected through workers falling sick or low-cost telecom operators- targeting low-income populations in developing countries- exiting the industry due to reduction in consumer spending (ITU, 2020). A supply-side aspect that will affect low and middle-income countries more than high-income countries is deployment of 5G projects. The increase in internet traffic in low and middle-income countries will accelerate capital spending for increasing network capacity, leading to diversion of resources from other non-urgent projects, including 5G investments (ITU, 2020). On the other hand, high-income countries with relatively advanced 5G deployment are likely to continue with their plans.

Indirect supply side-disruptions can arise from closure or suspension of manufacturing operations of ICT hardware and equipment nationally due to national lockdowns, travel bans and work-from-home strategies. The magnitude of the shock will depend on the labour intensity of the segment, with less automated labour-intensive manufacturing segments more adversely affected by social distancing and work-from-home strategies. In line with this, emerging evidence suggests a 6.5% decline in mobile phone growth post COVID-19, with a 12% Y-O-Y decline in the first quarter for smartphone manufacturing, which is highly labour-intensive,[3] and a 12.3% Y-O-Y decline in the first quarter for global PC sales, with a steep 27.1% decline in Asia-pacific.[4] On the other hand, more automated manufacturing segments such as semiconductors and memory devices are likely to

[3] https://www.trendforce.com/presscenter/news/20200217-10223.html

[4] https://www.prnewswire.co.uk/news-releases/coronavirus-impact-on-it-infrastructure-beroe-analysis-874266493.html

be less affected.[5] Similarly, the data hosting, server/storage category is predicted to witness a lower (3.3%) decline than the broadband sector; the former is highly capital and skill- intensive segment and is expected to benefit from the increased usage of digital connectivity and services (IFC, 2020).

Another indirect supply-side shocks can also arise from lockdowns and travel bans placed by key trading partners, leading to shortages in key imported materials. Currently, 81 countries[6] are bound by the Information Technology Agreement (ITA) to eliminate and bind custom duties at zero for all products specified in the agreement, which covers a large number of high technology products, including computers, telecommunication equipment, semiconductors, manufacturing and testing equipment, software, scientific instruments, as well as most of the parts and accessories of these products. China accounts for roughly 26% of global ITA exports (Figure 4). Hit by the pandemic, China's ICT spending is set to decline by 7.6% in the first quarter of 2020, with its spending on hardware expected to decline by 8.5% as a result of the pandemic (Farrell, 2020). The lockdown in Wuhan, specifically, is likely to have had a spillover effect on future digital strategies (of 5G technology and fibre optic roll-out plans) of various countries, given that Wuhan is home to Fiberhome, YOFC, and Accelink, among other companies, which together comprise 25% of the global optical fibre production capacity.[7] In line with this, Figure 5 shows a decline in imports of optical and other apparatus across several low and middle income countries, barring Russia, in the period January-June 2020. Such supply shocks are likely to adversely impact low and middle-income countries more than high-income countries, sine the former tend to have lower capabilities in substituting imports with domestic manufacturing (IFC, 2020).

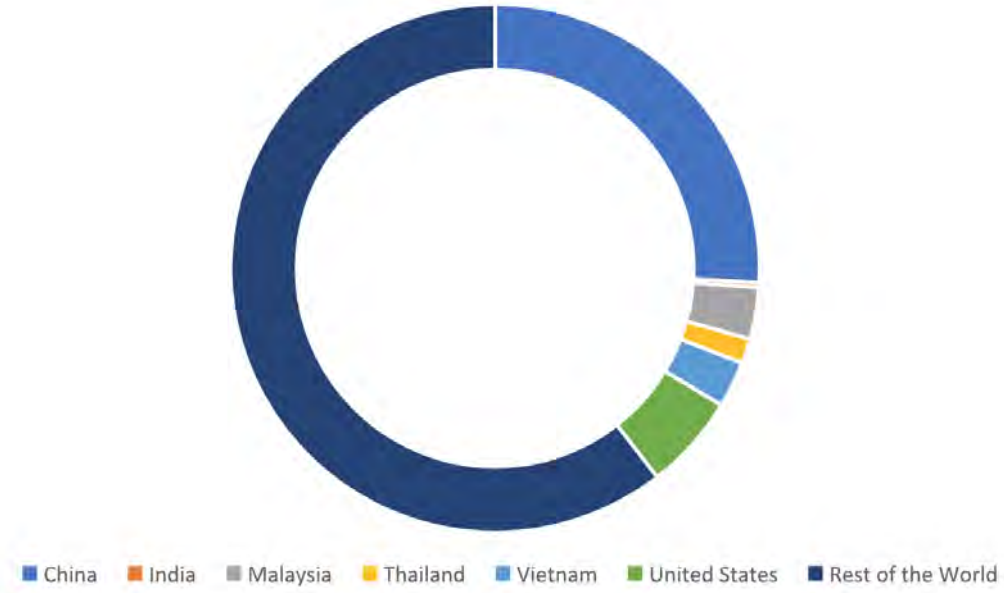
Seric and Winkler, (2020) also highlight the possibility of a global push towards automation and digitalisation by high-income countries in the future; in an effort to mitigate supply chain risks and increase flexibility post-pandemic, global lead firms may have an incentive to digitalise their supply chains and bring production back closer to home. This can lead to potential re-shoring of manufacturing operations and limited future offshoring to low and middle-income countries, which have traditionally been major offshoring hubs (Seric and Winkler, 2020). Kearney's (2020) re-shoring index shows that the manufacturing import ratio for US firms already increased to an unprecedented level in 2019 – 98 – but with firms reducing imports from China and increasing imports from other Asian economies. Of the $31 billion in US imports that shifted from China to other Asian low-cost countries, Vietnam absorbed 46% (ibid). There is already emerging evidence of the pandemic increasing automation in the semi-conductor manufacturing segment, with Vietnam, Mexico and India emerging as alternatives to manufacturing in China (Brown, 2020).

[5] See footnote 3.

[6] These 81 countries account for roughly 96% of global trade in information technology products.

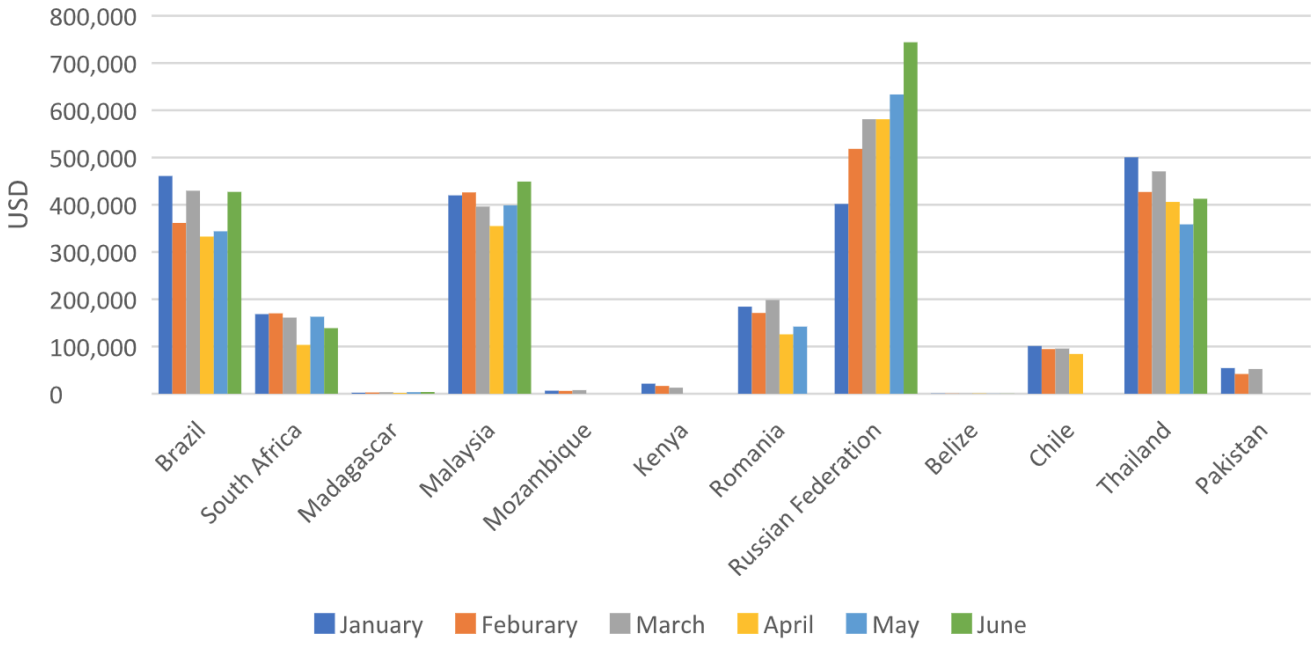
[7] https://www.cablinginstall.com/cable/article/14168410/charting-coronavirus-covid19-outbreaks-impact-on-the-global-hightech-industry

Figure 4: Export share in ITA products in selected countries, 2018 (in %)



Source: Authors, constructed from ITC data

Figure 5: Monthly imports of optical and other apparatus (in US$, thousands), 2020



Source: Authors. *Note: Data is from ITC for HS code 90.*

4. COVID-19 and ICT and ICT-enabled services

For many low and middle-income countries, services represent a growing share of total exports. As per UNCTADstat (2020), the average share of services exports (2017-2019) in total exports is about 16.7% in middle-income economies and 24.% in low-income economies, with some economies. In the period 2013-2018, exports of ICT[8] services increased in Asia on average by 9.5 per cent each year, in Latin America and the Caribbean, Europe and Oceania between 6 and 7 per cent, while they stagnated in Africa. Africa, in turn, together with Asia, saw comparatively strong growth in exports of ICT-enabled services,[9] increasing at annual rates of between 6 and 7% (UNCTADstat, 2020).

On the demand side, as businesses shift online and consumers work from home, the demand for ICT and ICT-enabled services is likely to increase, thereby creating a new development opportunity for low and middle-income countries. There is likely to be increasing demand for cloud services and data hosting services. The global demand for digitisable products is also expected to have risen during the pandemic; these products refer to goods which can be electronically transmitted - such as audio files, video files, video games etc. The global video game market is forecast to be worth $159 billion in 2020, with close to half (48%) of the industry's revenue coming from mobile gaming (WEF, 2020). According to figures from Newzoo, the mobile games market will generate revenues of $77.2bn in 2020, representing year-on-year (y-o-y) growth of 13.3% (OBG, 2020). In terms of production and supply, mobile games are relatively less affected by COVID-19 containment measures, as the development process for individual applications is simpler than for more complex platforms, and hence less prone to disruption. This segment also has a lower barrier to entry; there is no need to invest in equipment such as a gaming console, and many games use a free-to-play monetisation model. The pandemic has accelerated an increase in consumer engagement with mobile games, particularly in emerging markets, which fare well in terms of mobile phone penetration. Individual South-east Asian countries particularly constitute significant national markets; for instance, expenditure on gaming was roughly $572 million in 2019 in the Philippines. As discussed in Box 1, the BPO industry in Philippines is heavily dependent on call-centre services. With disruptions caused by the pandemic and automation replacing low-skilled jobs in the sector, greater attention is being paid to fostering higher value knowledge process outsourcing (KPO) industry, which includes creative process outsourcing, corporate digital solutions, and the development of software and video games (OBG, 2020b).

Another segment that holds potential is digital animation services; the 3D animation market garnered a revenue of USD 15.7 billion in the year 2019 globally, with Nigeria, Egypt, Kenya, Tanzania, Uganda, Ghana, Zimbabwe, and Ethiopia emerging as leaders on the African continent through content productions as well as collaborations in the animation, VFX and video games

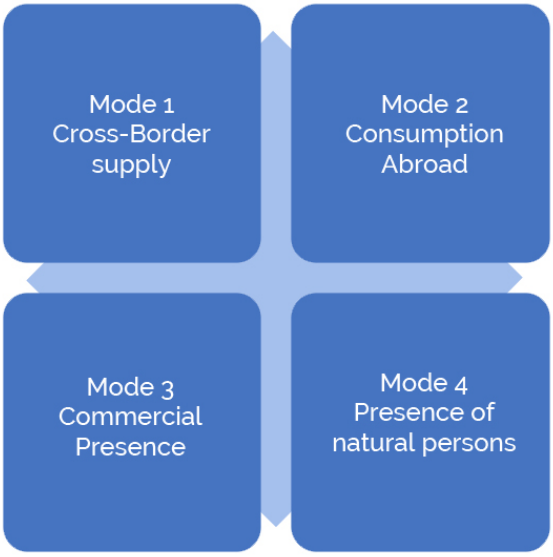
[8] ICT services are composed of IT services such as programming, systems integration, application testing, IT infrastructure management and maintenance, IT consulting, software development and implementation services, data processing and database services, IT support services, data warehousing.

[9] ICT-enabled services can be divided into three subcategories: front-office services such as call centres and customer care centres; back-office services including data entry, human resources, payroll, finance and accounting; and knowledge-processing outsourcing services such as financial analysis, data mining, engineering, research and development, insurance claims processing, architectural design etc (UNCTAD, 2015).

industry (Reports Globe, 2020). UNCTAD (2018) also highlights the potential of 2D and 3D animation services in Cambodia. ODI and CDRI's (2020) case study of Cambodian firm Ink Animation in 2019 (pre-COVID-19) points to a promising example of the new opportunities in a services-led economic transformation. The firm is involved in animation of films and distributes animated films internationally through online means, using its good contacts abroad, including through a Netflix series. In 2019, it employed some 60 staff, with plans to expand to 200–300 in coming years, and starting salaries are much higher than the minimum wage. It is a very good example of a promising digitally based services exporter in a lower-income country.

On the supply side, the pandemic on ICT[10] and ICT-enabled services[11] is likely to be limited. The magnitude of supply-side shocks on services sectors depends on a) the mode of supply and b) the capacity of the service to go digital. Services can be supplied using four different modes; movement of services across border (Mode 1), consumption of services abroad (Mode 2), supply via commercial presence (Mode 3) and supply via movement of people across borders (Mode 4)- see Figure 6. The adverse effects of social distancing practices, travel bans and national lockdowns in the wake of COVID-19 are likely to be the largest for services transacted via Modes 2, 3 and 4 since these require some form of physical proximity between the suppliers and consumers (Shingal, 2020). WTO's (2020) Services Trade Barometer shows that the travel and tourism service- which account for the highest share in trade services in Africa- have been hit the hardest by the pandemic. Tourism services are mostly associated with Mode 2; but involve other modes of supply as well, such as through establishment of a branch of a hotel chain abroad (Mode 3), hiring of foreign managers in that hotel (mode 4) and sale of services by international tourism operators through online reservation systems (Mode 1).[12] Travel bans and border closures during the pandemic are affecting the supply of tourism services, across modes 2 to 4, with tourism arrivals expected to decline by between 60–80% this year (UNWTO, 2020), with an estimated 20–30% decline projected in global tourism exports (IMF, 2020).

Figure 6: Modes of supply in services



Source: GATS.

[10] See footnote 8.

[11] See footnote 9.

[12] https://unstats.un.org/unsd/tradeserv/TFSITS/DraftChapterV_29August.pdf

Consider the case of computer and related services- these can be delivered by cross-border supply i.e. sales of computer and related services through electronic networks to a non-resident who stays in his/her home country (Mode 1); purchase of packaged software by foreign residents (Mode 2); foreign investment in domestic firms providing computer services (Mode 3), and through IT consultants when they go abroad for work (Mode 4). However, IT services are predominantly exported through cross-border transactions (Mode 1) with EU as the largest exporter, followed by India (World Trade Report, 2019). More than three quarters of India's IT services exports are now delivered online as opposed to on-site as before; IT services account for close to 40% of India's total services exports and along with management consultancy services, is one of the few sectors where the country exhibits a revealed comparative advantage (Shingal, 2020).

Given the rising demand for ICT services and their resilience to any voluntary and selectively imposed social distancing, an ICT-services led recovery holds promise for low and middle-income countries. But how realistic is such a recovery? The share of ICT and ICT-enabled services in total service exports varies significantly across countries, with computer and related services accounting for more than 50% of commercial exports in Myanmar, Bangladesh, Pakistan, India, Ghana and South Sudan; they account for less than 10% of service exports in Cambodia, Ethiopia, Mozambique, Zambia, Nigeria, Tanzania and Rwanda (Figure 7). The share of ICT-enabled service exports in total service exports is also low, particularly in low-income countries. While the share of ICT-enabled services is over 40% in selected Asian economies, such as China, India, Nepal and Pakistan, it is less than 20% in Cambodia, Namibia, Nigeria, Uganda, and Mexico (Figure 8).

Access to and usage of cloud and data hosting services in emerging markets currently tends to rely on data centres outside their local markets, with limited domestic capabilities. Cloud services (outside China) remain dominated by Amazon Web Services, Microsoft Azure and Google Cloud (ITU, 2020). As shown in Figure 3, several African countries don't have broadband speeds adequate and affordable enough to support reliable cloud service usage. This could explain why the public cloud market in Africa is relatively small- less than 1% of estimated global public cloud services revenue was generated in Africa as of 2018- led by South Africa, Mauritius, Kenya, Tunisia and Morocco (Xalam Analytics, 2018). Similarly, the Cloud Readiness Index 2020 for APAC countries shows that while cloud readiness scores have advanced for all 14 countries, the lowest scores are found for Vietnam, Philippines and Indonesia.[13] Despite a promising digital economy, Indonesia witnessed a drop in cloud readiness due to declining broadband quality. Philippines saw declining readiness, in part due to weaker international connectivity and data centre risk. Vietnam ranks last of all the APAC countries; it has fallen behind on international connectivity, data centre risk and it is difficult to coordinate regulatory environment. While Thailand has made progress in international connectivity, data centre risk and privacy policies, this has come at the cost of broadband quality and energy sustainability.

[13] https://w.media/asia-pacific-at-risk-of-losing-out-on-post-pandemic-economic-recovery-by-not-leveraging-on-next-generation-cloud-technology/

Figure 7: ICT services, share in commercial service exports (2018)

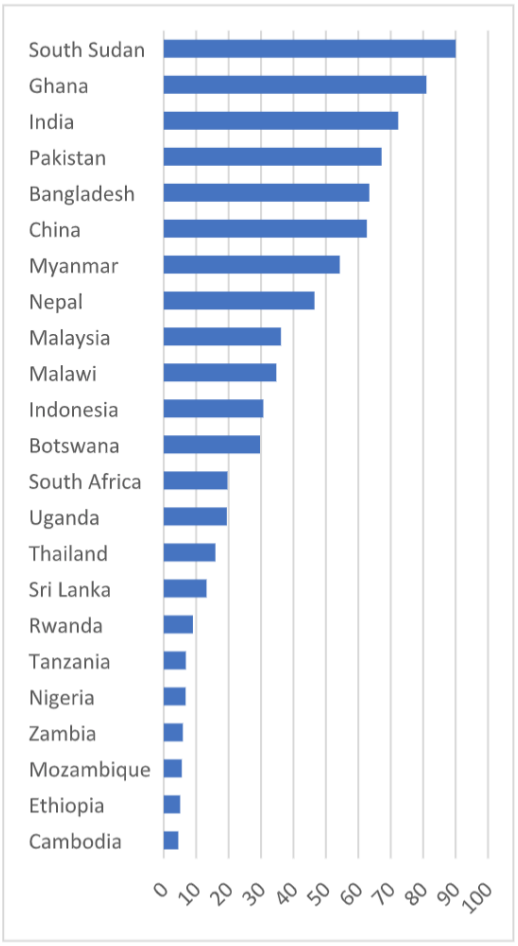
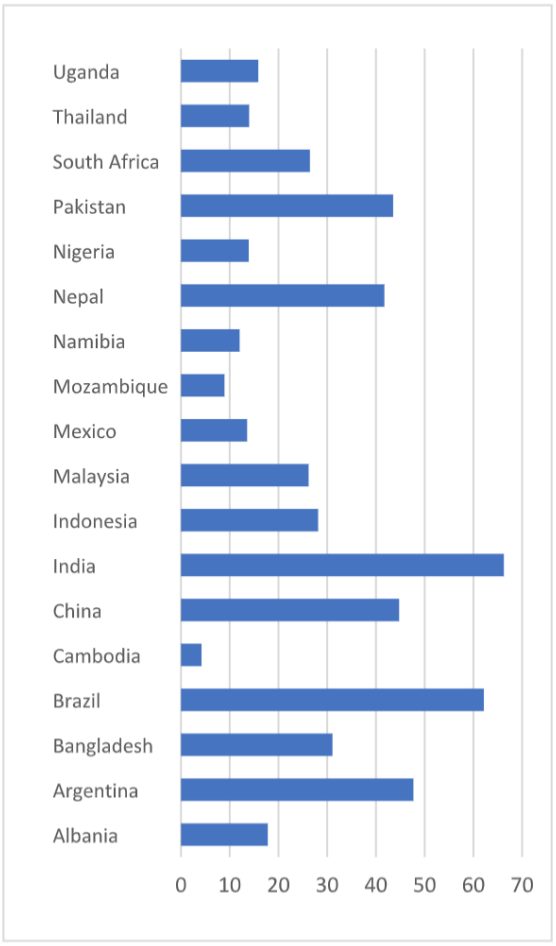


Figure 8: ICT-enabled services, share in total services exports, (2017)

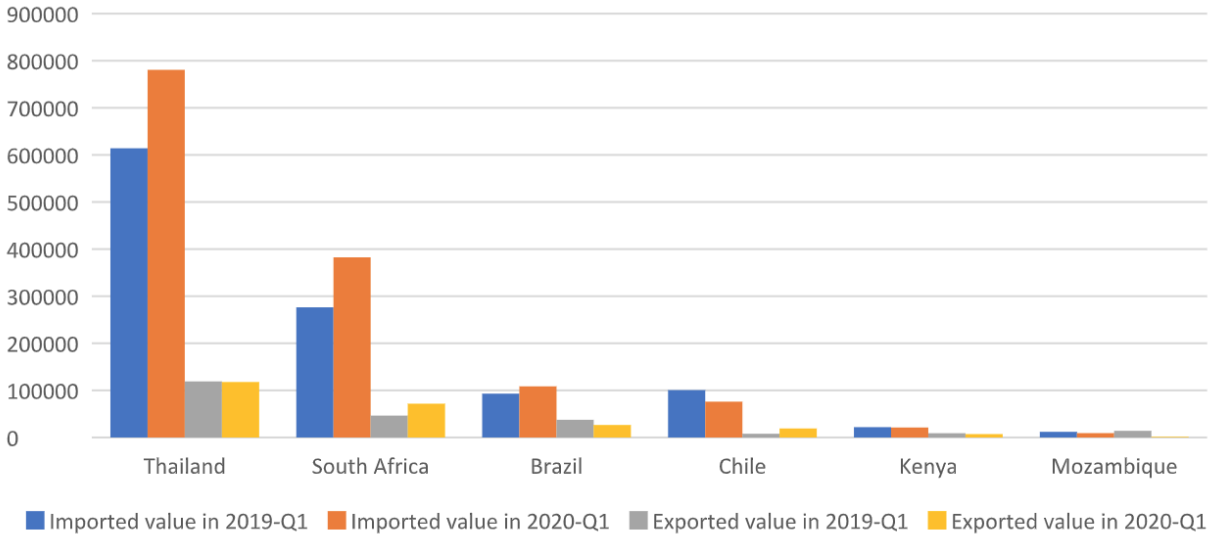


Source: WB and UN data. *Note: ICT services are computer, communication and other related services.*

The rise in demand for digitisable goods is also likely to primarily benefit the US and China; 90% of the market capitalisation of the world's 70 largest Big Tech companies accrues to these two economies. The EU's share is a paltry 4 percent and Africa and Latin America together account for 1 % (UNCTAD, 2019). The top 15 exporters of digitisable goods are also all high-income countries, with the exception of China, and together they account for 82% of the global exports (Banga and te Velde, 2018a). Figure 9 maps import and export values of selected low and middle-income countries in digitisable goods in quarter 1 of 2020, as compared to quarter 1 of 2019. It is observed that during the pandemic, exports of digitisable goods have declined in Thailand, Brazil, Kenya and Mozambique, but imports have increased in Thailand, South Africa and Brazil. For most low and middle-income countries in Africa, the share of digitisable goods in total exports is less than 1% (Banga and te Velde, 2018a). Opportunities for 3D animation activity are still low in scale in many low and middle-income countries; North America continues to account for the largest market share in 3D animation of 42.1%, followed by Asia-Pacific with 32%, Europe with 17%. The rest of the world accounts for 9% of the market revenue.[14]

[14] https://www.marketresearchfuture.com/reports/3d-animation-market-2760

Figure 9: Quarterly trade in digitisable goods (US dollars)



Source: ITC, quarterly data (2020)

Note: Digitisable goods are identified using UNCTAD's (2000) classification; HS 37 (films), 49 (printed matter), 8524 (sounds, media and software) and 9504 (videogames).

Box 1 : BPO sector and COVID-19; the case of Philippines

The BPO industry in Philippines employs over 1.2 million people, contributing to roughly 9% of GDP. Similar to other sectors, the BPO sector was hit by restrictions on the mobility of workers and demand disruptions, however, as a result of its importance, companies were allowed to continue operations using a skeletal workforce, maintaining social distancing, and providing staff with temporary accommodation or a reliable shuttle service to homes within the immediate vicinity

The surge in flight cancellations, e-commerce orders and financial service enquiries temporarily boosted activity for operators with related contact centres in the Philippines, however BPO firms faced both supply and demand-side disruptions as a result of the pandemic. On the supply side, there were challenges related to internet access, equipment transfers and clearance requirements from clients. Global in-house centres that form part of international companies found it easier to make the transition, as their clearance procedures were less complicated. There was also dwindling demand; a significant proportion of the BPO work undertaken in the country is imported from the US, which is hit hard by COVID-19 in terms of infections, closures and jobless claims. Furthermore, demand for basic call-centre services (forming 50-60% of customer contract operations) is already under pressure from AI-powered chatbots.

As the COVID-19 pandemic raises global demand for health care services and home entertainment, it is reasonable to expect that growth in these segments could be even higher than previously predicted. However, there is an urgent need for diversification into new markets and BPO clients.

Source: OBG (2020c) and Borneo Post (2020)

5. COVID-19 and e-commerce

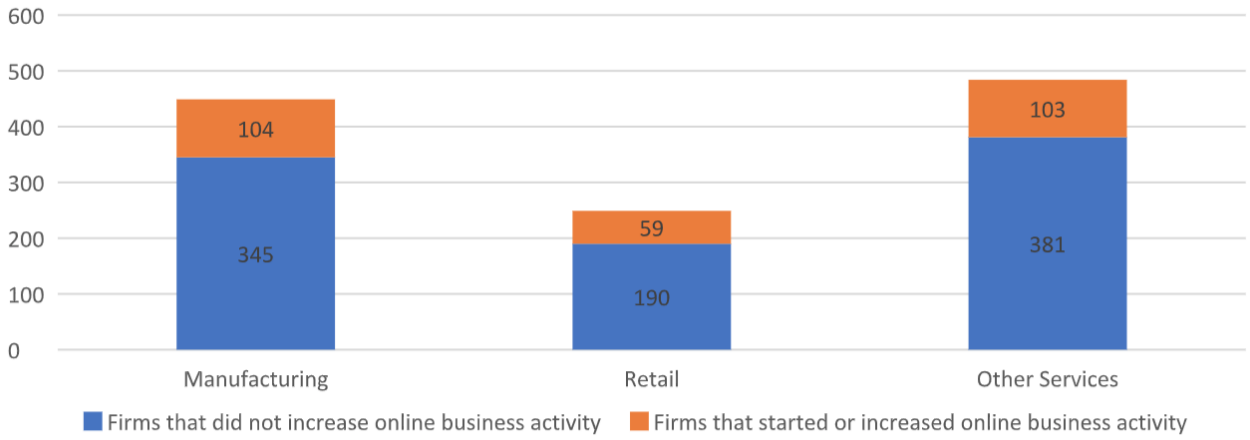
Digital exchange platforms and cross-border e-commerce present important opportunities to low and middle-income countries through growth in online retail exports and diversification into new products and markets. E-commerce also offers important opportunities for women-led MSMEs to enter the export market, particularly in sectors such as garments and textiles, which has been adversely hit by the pandemic.

Emerging evidence suggests that the pandemic has directly accelerated e-commerce, with a spike in both business-to business and business-to-consumer online sales, particularly in medical supplies, household essentials and food products (WTO, 2020). Online marketplaces allow for remote purchases and delivery services which adhere to social distancing, with firms selling online through their own e-commerce enabled websites or through third-party platforms. Many of these businesses are likely using communication platforms such as WhatsApp or Facebook to communicate with customers and suppliers more efficiently, in addition to using online banking and digital payment platforms, such as E-wallet, over cash during the pandemic. Consumption patterns are however changing. In Cambodia- where most ecommerce ventures to reach a clientele of 15,000 consumers in 2017 (Banga and te Velde, 2020)- online food delivery is taking off. Cambodia-based Grocerdel – an online startup that delivers fresh farm produce in Phnom Penh – has reported its sales rocketing by over 165%, with a 50% increase in staff intake to meet the spike in demand during the pandemic (UNCTAD, 2020). In Indonesia, Bukalapak- one of the five unicorn start-ups-has reported a spike in transactions due to growth in new users as a result of shifts in MSME business model and consumption behaviour (OBG, 2020), with another Indonesian e-commerce firm Blibli reporting increasing online sales of groceries, cleaning and sanitising products, surgical masks and vitamins, with heightened demand for cooking appliances, video games and exercise equipment but declining demand of smartphones, automotive, shoes, formal dress and travel (ibid). In Bangladesh, e-commerce is still in its early stages but consumer adoption is gradually picking up due to strong engagement of the private sector in informing policy making, and important policy initiatives such as the ITC policy 2019 and the National Digital Commerce Policy 2018 (UNCTAD e-trade readiness, 2019). The number of deliveries per day (before COVID-19) was around 60,000 in the online commerce segment- twice that of traditional couriers- and the market size of e-commerce in Bangladesh is around USD 1 billion.[15] The E-Commerce Association of Bangladesh (e-Cab) estimates that the pandemic has resulted in a 70-80% growth in online sales as compared to regular times (Hasan, 2020), with an increasing demand for essential products. Some online grocery platforms in the country, such as Chaldal (online groceries), have particularly witnessed a significant growth in orders.

In addition to direct demand shocks, e-commerce has been indirectly affected by supply-side disruptions to physical retailers. For instance, it has emerged as a key pillar in African businesses' response to the pandemic, across manufacturing, retail and other sectors. World Bank's (2020) 'Impact of COVID-19 survey' data from 1182 firms across four African countries- Niger, Togo, Zambia, Zimbabwe- shows that 266 firms (22.50%) of the sample report adopting a digital response to the pandemic i.e. report starting or increasing online business activity, mainly in the manufacturing and other services category (See Figure 10).

[15] http://newvision-bd.com/wp-content/uploads/2020/05/Impact-of-COVID-19-on-E-commerce-Industry-of-Bangladesh.pdf

Figure 10: Distribution of African firms, by sector and digital response to the pandemic



Source: WBES (2020). Data is from Niger, Togo, Zambia and Zimbabwe.

Conducting basic difference-in-proportions and difference-in-means tests across firms that have adopted a digital response to COVID-19 and those that haven't,[16] Table 1 finds that firms with a digital response are faring better across a range of economic outcomes. In all three sectors- manufacturing, retail and other services - over 70% of the firms with a digital response report having adjusted or converted production, compared to roughly 40% of firms with no digital response, and over 50% of firms with a digital response report having started or increased delivery of goods and services, compared to less than 25% of firms with no digital response. Similarly, a significantly higher share of firms with a digital response in manufacturing and retail sectors report witnessing an increase in demand for their goods and services and a higher share export over 10% of sales directly compared to firms with no digital response to the pandemic. In terms of working remotely, across all three sectors, over 35% of firms with a digital response report having started or increased remote working, with over 10% of their workforce working remotely, which is significantly higher compared to firms without a digital response. Interestingly, 6.77% of firms in retail sector and 4% of firms in other service sectors report an increase in monthly sales compared to a year ago, with 3.5 % of retail firms also reporting a permanent increase in employees. See Box 2 for a case-study on how trade in digital services and e-commerce is faring during the pandemic in Kenya.

[16] Difference in means test demonstrate correlation between digital outcomes of firms and economic resilience outcomes, not causation. Potential selection effects.

Table 1: Digital Response to COVID-19 and economic outcomes in Africa

	Manufacturing		**Retail services**		**Other Services**	
Digital response adopted by firms	Yes	No	Yes	No	Yes	No
Adjusted or converted production or services	73.07*** (4.37)	37 (2.60)	71.18*** (5.94)	42.10 (3.59)	76.69*** (4.18)	40.10 (2.52)
Witnessed increased demand of goods and services	9.61* (2.90)	4.94 (1.70)	11.86*** (4.24)	2.68 (1.18)	7.84 (2.67)	4.23 (.03)
Witnessed increased supply of inputs	5.76 (2.29)	4.08 (1.06)	3.44* (2.41)	0.54 (0.54)	3.96 (1.95)	1.62 (.65)
Started or increased delivery of goods and services	56.73*** (4.88)	22.60 (2.25)	57.62*** (6.48)	10 (2.18)	51.45*** (4.94)	13.91 (1.77)|
Started or increased remote work	43.26*** (4.88)	21.44 (2.21)	37.28*** (6.34)	12.83 (2.45)	59.22*** (4.86)	15.22 (1.84)
Exporting at least 10% of sales directly	18.81** (3.90)	10.51 (1.68)	12.28*** (4.38)	2.23 (1.10)	18.75*** (4.00)	8.14 (1.45)
Increased liquidity or cash flow availability	7.69** (2.62)	2.89 (0.90)	5.08 (2.88)	2.11 (1.04)	2.94 (1.68)	2.12 (0.74)
Increased monthly sales compared to one year ago	4.80 (2.10)	2.33 (0.81)	6.77** (3.30)	1.62 (0.93)	4.85* (2.12)	1.87 (0.70)
Increased total number of permanent employees.	3.06 (1.74)	2.14 (0.80)	3.50* (2.45)	0.54 (0.55)	2.00 (1.40)	1.92 (0.72)
Average outcomes (differences-in-means test)						
Capacity Utilisation (%)	42.66 (1.98)	43.98 (.35)				
Proportion of workforce working remotely	14.50** (2.47)	7.68 (1.12)	11.37** (3.37)	4.44 (1.18)	19.15*** (2.77)	6.07 (1.00)

Source: WBES, 2020. Sample includes firms in four African countries Niger, Togo, Zambia, Zimbabwe. N = 555 in manufacturing; 293 in Retail; and 654 in Other services. In the manufacturing sector, 100 firms in the sample have started/ increased online business activity, while 345 haven't. For retail services, 59 have, 190 haven't. For other service, 100 firms have while 275 haven't.

The demand for e-commerce however varies across income groups, gender, age and education of the population, which the pandemic threatens to exacerbate. As shown in Table 2, on average, 24% of the world's population is engaged in online buying, but only 2-4% of the population in low and lower middle-income countries is buying online. While 57% of females in high-income countries are engaged in online buying, it falls to 1% in low-income countries. Similarly, over 60% of the youth in high-income countries is buying online, but this falls down to 44% in upper-middle income countries, 7% in lower middle-income countries and 3% in low-income countries. Online buying also varies with education; on average, 36% of the people with secondary or more education have access to internet, as compared to 10% of people with only primary education. But while

64% of the population with secondary education in high-income countries is engaged in online buying, this falls to 4% in low-income countries. E-commerce uptake is also closely related to consumer online trust; Banga et al.'s (forthcoming) survey of 31 African companies finds that 60% of small firms in the sample rank low online trust of consumers as the primary obstacle constraining e-commerce. This lack of trust stems from concerns regarding data privacy, unreliable payment systems, and lack of dispute resolution mechanisms.

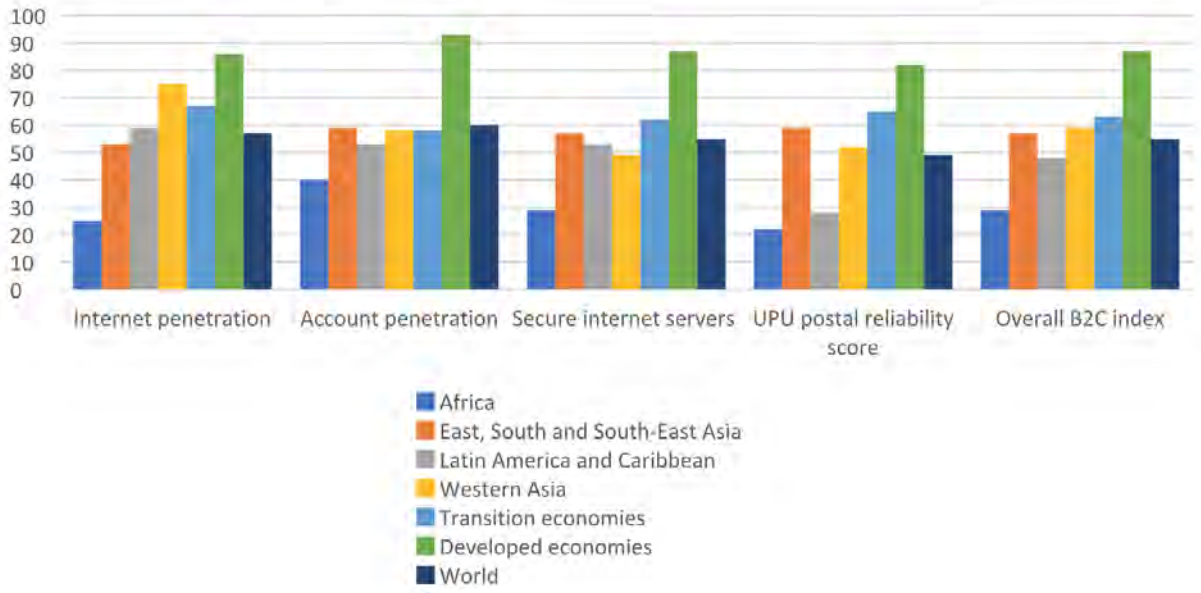
Table 2: Online buying, by share of population (%)

	Share of total population (15+)	Male (15+)	Female (15+)	Youth (15-24)	Older adults (25 and over)	Primary education or less	Secondary education or more	Poorest 40%, by income
High income	59%	61%	57%	65%	58%	31%	64%	50%
Upper middle income	32%	33%	32%	44%	30%	20%	43%	19%
Lower middle income	5%	5%	4%	7%	4%	1%	8%	2%
Low income	2%	3%	1%	3%	2%	1%	4%	1%
Global Average	24%	25%	24%	24%	25%	10%	36%	17%

Source: Global findex report. Data is for 2017.

On the supply side, e-commerce of goods has been directly affected by labour shortages, administrative and regulatory bottlenecks and quarantine conditions, and indirectly through suspension of manufacturing activity, decreased production and new health regulations, which have led to disruptions in land, sea and cargo transportation (WTO, 2020). Cancellation of passenger flights typically used to transport postal shipments and other small consignments, has significantly reduced transport capacity and increased shipping prices for cross-border B2C and B2B transactions. Commercial B2B e-commerce relying on large-scale imports via maritime transport has also been affected. Significant differences already exist in terms of B2C e-commerce across regions and income groups (Figure 11). As per UNCTAD's (2019) B2C index- which draw information on internet and account penetration, internet servers, and postal reliability- developed countries fare significantly better than the world average (87 index value compared to 55). Africa ranks the lowest on the B2C index, with a value of 29, faring particularly low on postal reliability. Findings from UNECA and IEC's (2020) survey of 206 firms across Africa are therefore unsurprising; the study finds that while e-commerce is emerging as an important priority, e-commerce revenues remain relatively small (around 16%), with lower share in goods than services, largely due to problems related to poor internet connection and digital payments (ibid).

Figure 11: B2C E-commerce index, 2019



Source: UNCTAD B2C e-commerce index, 2019

When analysing the effects of the pandemic on e-commerce sales, it is key to understand that e-commerce business models are quite varied. For instance; firms can have physical stores and also sell online, through their e-commerce enabled websites or third-party e-commerce platforms, such as Amazon, or both. Others can be e-tailers i.e firms which only sell through online channels (using own website or third-party platforms) and don't have physical stores. Data from 257 representatives of e-commerce businesses from 23 countries, mainly least developed countries in Africa and Asia-Pacific, suggests that third-party online marketplaces have been more resilient to the pandemic than e-commerce companies; nearly 60% of third-party marketplaces, which are wholly-digital, report an increase in monthly sales since the outbreak of the pandemic (UNCTAD, 2020c). But data from the COVID-19 Commerce Insight shows that pure digital retails or e-tailers, which sell goods and services only through an online channel have not been faring well in low and middle-income countries. Table 3 presents growth in pure e-commerce revenue (of e-tailers) for selected countries and it is observed that France, UK and the United States have witnessed significant increases in e-commerce revenue in August 2020 as compared to August 2019. However, selected Asian countries, and Nigeria, show a decline in online revenue growth, indicating that underdeveloped e-commerce markets were not sufficiently ready to respond (ITC, 2020). In some markets, including India and South Africa, this could also be explained by the ban on transportation of goods deemed non-essential, which has effectively suspending e-commerce for small businesses (Howe, 2020). In Bangladesh, third-party online logistics suppliers, such as Paperfly, experienced an almost 90% decrease in orders during lockdowns due to shortage of qualified workers, safe packaging, poor delivery infrastructure etc.[17]

[17] https://databd.co/stories/delivery-services-in-bangladesh-coping-with-covid-19-12228

Table 3: E-commerce revenue growth in selected countries, August 2020

Country	Pure E-commerce Revenue growth (in %).
High-income countries	
France	+ 55
UK	+ 29
US	+ 58
Sweden	+ 117
Low and middle-income countries	
Malaysia	-60
Thailand	+55
Indonesia	-79
South Africa	-4
Egypt	-13
Nigeria	-30
India	-98

Source: CC insight. Based on the transaction data of 2,500 brands (customers of data services firm Emarsys) across 100 countries. E-commerce revenue growth has been calculated as e-commerce revenue for previous 14 days, as reported on 3rd August 2020 divided by e-commerce revenue over the same period in 2019.

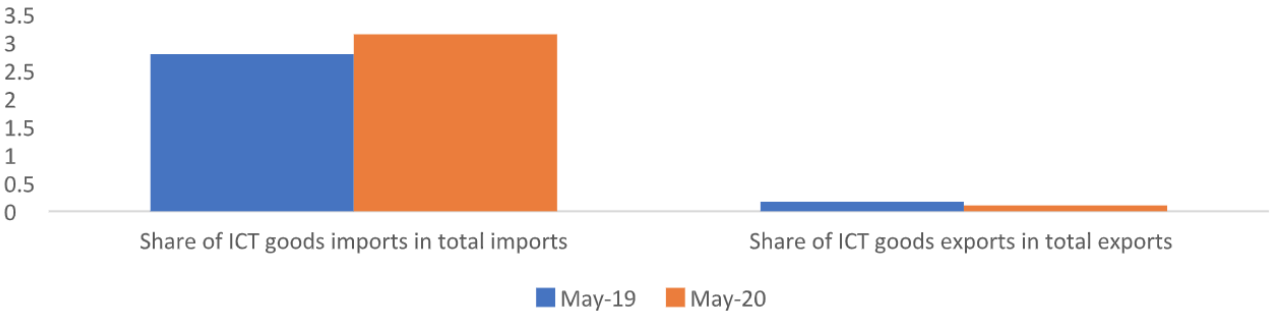
Box 2: Digital goods, services and e-commerce in Kenya

Data from KNBS shows that share of ICT goods imports in total Kenyan imports in May 2020 was higher than the share in May 2019, while share of ICT goods in exports have recorded a decline. The lockdown has generated a larger demand for communications, computer and information services; Safaricom, for instance, has seen a 70% surge in data usage as Kenyans stay at home to curb the spread of COVID-19. As businesses shift online, the demand for cloud computing is also on the rise. The cloud service market in Kenya in 2017 to $275 million. In February 2020, Safaricom announced a partnership with Amazon Web Services (AWS) to sell AWS services, primarily cloud, to East Africans. It is also offering doubled internet speed for home fibre packages at no extra cost to users, while Telkom Kenya is rolling out Google Loon to boost 4G coverage. However, MSMEs are lagging in the use of cloud computing; less than 25% of them use it, against over 40% of large firms. The share of digitally deliverable export services in GDP in Kenya was 1.58% in 2016 while its share in total service exports was 24.22%. Kenya is particularly a hub for global digital BPO, through government promotion schemes like Ajira. At present, 7,000 Kenyans work in BPO jobs, with an estimated 286,000 employed by digital service platforms in transport, logistics and e-commerce. However, while 80% of IT companies surveyed have a website, this is less than 50% in most other services subsectors.

Established online marketplaces have ramped up their operations in response to the COVID-19 outbreak, leading to a rise in e-commerce. These include Twiga Foods, Selina Wamucii, M-Farm, Farmers Market Kenya, Farmbiz Africa and Mkulima Young. Local platform GoBeba reported that its gross merchandise value tripled in the three weeks following the first reported

COVID-19 case in Kenya on 13 March, driven by sales of household essentials. Sky.Garden has seen an increase in demand for Fast-Moving Consumer Goods, productivity tools (computing products and accessories), entertainment electronics (TVs, home theatre, decoders), educational material and toys. Java House has also partnered with Uber Eats, Jumia Food and Glovo to encourage Kenyans to make use of online shopping and food deliveries. As a response to the crisis, 30% of KAM members surveyed are now aiming to increase online capabilities. Jumia has partnered with the Kenya Private Sector Alliance to enable local businesses to set up their e-shop on the Jumia platform at no start-up costs, with Jumia halving its commission on vendors for locally manufactured goods to 1%. KAM has also launched a digital directory for locally manufactured goods to help customers shop online. To encourage the use of digital payments by MSMEs, Safaricom is allowing them to increase their daily M-Pesa transaction limit from approximately $700 to $1500.

ICT goods trade in Kenya (in %), May 2020



Source: Banga (2020), KNBS (2020), KAM

6. COVID-19; online work and digital labour

A segment of workers has always worked remotely – i.e. software developers, graphic designers, data labellers and others who earn some or all of their income from freelance projects and tasks obtained via online labour platforms. Online labour platforms[18] can be subdivided into freelancing platforms (e.g. Upwork, TopTal, Fiverr) where payment is on an hourly or milestone basis, and microtask platforms (e.g. Amazon Mechanical Turk) where payment is on a piece rate basis (Stephany et al., 2020).[19]

The global market for online labour has grown approximately 50% between 2015-2018 (Kässi & Lehdonvirta 2018). On the one hand, these digital platforms (such as Upwork) can reduce the cost of exchange within the informal economy, raising productivity, and connecting the informal segments of the economy with the formal sector. This is particularly useful in low and middle-income countries in African economies and some Asian economies where the informal sector already forms a large share of the economy (Pathways for Prosperity, 2018). On the other hand, the demand for digital labour mainly comes from wealthy economies, with workers across the globe competing (Graham et al., 2017), leading to over-supply of workers from low and middle-income countries on digital platforms (See Table 4). As per the Online Labour Index 2020, the largest share of online labour demand originated from employers based in the United States, who posted 41% of all projects recorded. The second largest buyer country for online freelance work is the United Kingdom (8%), followed by India (6). Only 3% of the demand for online workers comes from the whole of Africa (Stephany et al., 2020).

Table 4: Oversupply of workers on upwork.com

Commonwealth countries	Potential workforce	Successful workers	Oversupply (%)
India	249,698	22,772	90.8
Pakistan	66,681	6,032	90.9
UK	56,644	2,924	94.8
Kenya	18,508	898	95.1
Malaysia	13,385	317	97.6
South Africa	2,723	593	95.3
Nigeria	8,032	297	96.3
Ghana	1,656	50	96.9
Uganda	1,176	21	97.3

Source: Ojanperä and Graham (2019).
Notes: Potential workforce estimated by total searchable worker profiles, successful workers identified as those with at least one hour worked and $1 earned.

[18] These are different from local gig economy platforms such as Uber or Deliveroo, which involve physical onsite service delivery (Wood et al . 2019)

[19] https://journals.sagepub.com/doi/full/10.1177/0950017018785616

The potential demand and supply mechanisms through which the pandemic can affect online labour is summarized in Table 5. Over the past several years, the Online Labour Index has shown a clear seasonal pattern: demand drops during the year-end holiday season, and then rises again to reach a plateau in February, which normally persists until May. However, by mid-March 2020, when COVID-19 had become a pandemic, the Online Labour Index was in deep decline, in comparison to 2018 and 2019.[20] It recovered in April 2020, and surpassed previous levels, but has been declining since July (Figure 12). The effect on online labour will ultimately depend on the type of online work being performed; demand in creative and multimedia or sales and marketing support has shrunk but requests for projects in the software development and technology category remain largely unaffected (ibid). For Africa, the OLI reports a one-point increase in online work contracting since the beginning of the crisis (Kässi et al., 2020). This can be particularly useful for employment creation in a country like Kenya, where roughly 53,700 people are estimated to be online workers in 2018; and a minimum of 25,000 Nairobians earn on average $300 per month conducting some form of online labour (Melia, 2020). Top occupations for online work in Kenya are writing and translations, software development and clerical and data entry (OLI, 2020).

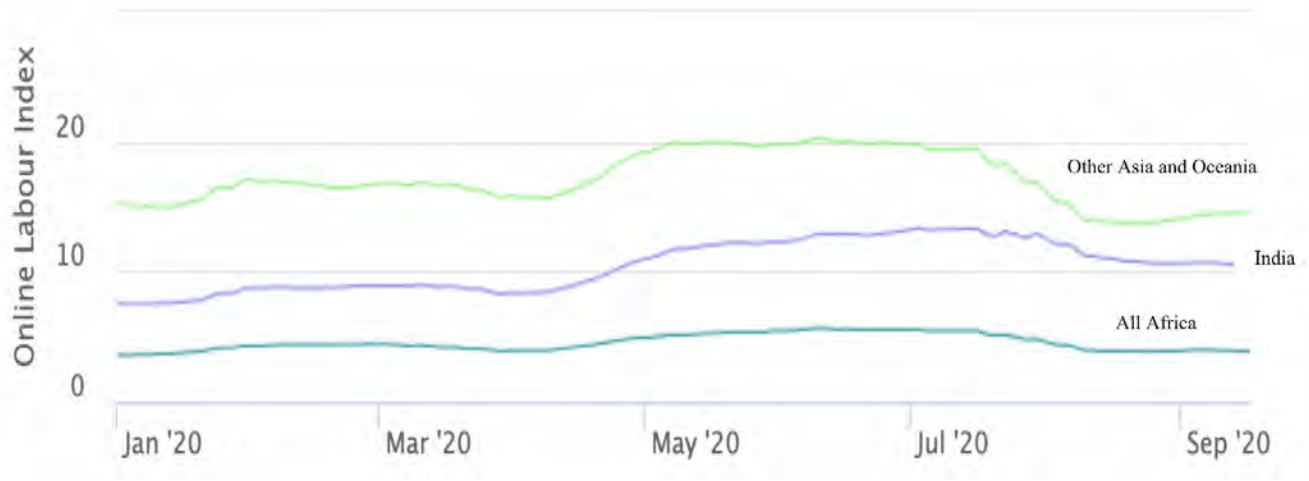
Table 5: COVID-19 and digital labour; impact pathways

Disruption channel	Impact	Pathway
Demand	+	Companies are increasingly shifting towards home-based working, remote working and virtual collaboration which is likely to increase remote-by-design labour markets
	+	Increase in demand for IT contractors who can help companies set up and maintain remote work, training etc.
	-	Online labour forms part of non-standard workers which are often used as a flexible buffer that can reduced during economic downturns
	-	Reduced outsourcing
Supply	+	The number of workers offering services online might conceivably increase, because the pandemic and its countermeasures have led to record-high unemployment in many countries, freeing up skilled workers (del Rio-Chanona et al. 2020).
	-	Workers who are not laid off from their regular jobs might decrease the number of hours they supply through online labour markets, to signal loyalty to their employers
	-	Existing full-time or part-time online freelancers might also decrease the hours supplied online as a result of falling ill or having increased care and housework duties, as schools and daycare centres close or family members fall ill.

Source: Stephany et al. (2020)

[20] https://ilabour.oii.ox.ac.uk/pandemics-effects-on-online-freelance-work-distancing-dividend-or-downscaling-loss/

Figure 12: Online Labour Index, Jan-Sept. 2020



Source: OLI, 2020

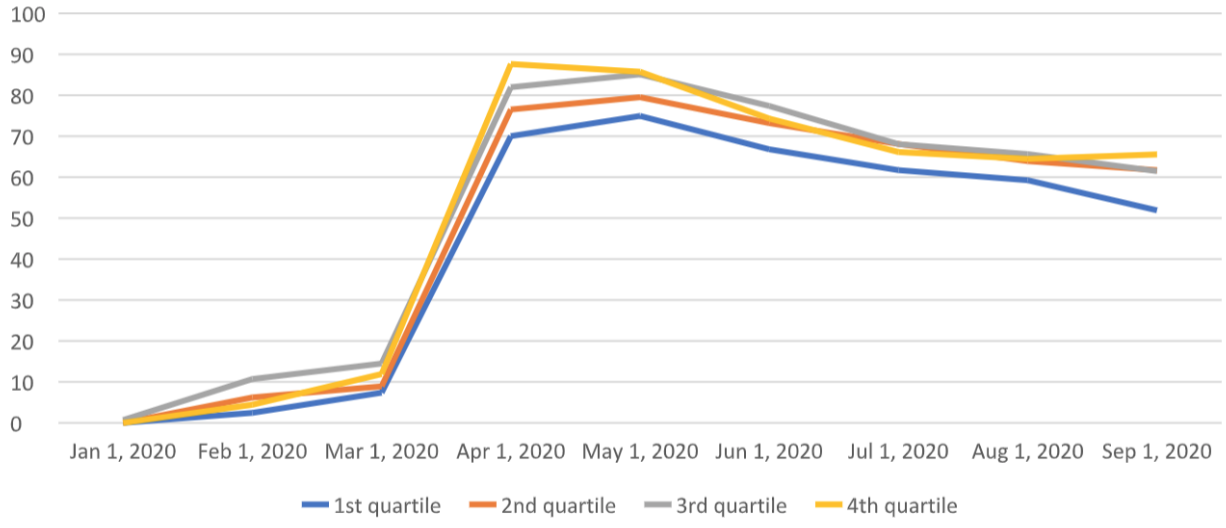
7. Digitalisation; a pathway for mitigating COVID-19 losses?

As discussed above, the pandemic has accelerated some segments of the digital economy. But the digital economy has also played a critical role in response to the crisis. This has put a spotlight on some pre-existing policy bottlenecks, in addition to emergence of new issues and challenges to digital transformation. It is important for low and middle-income countries to ensure that the pandemic does not exacerbate or reinforce existing digital divides. In this section, we first look at how digital solutions are being leveraged for crisis recovery by governments and firms, followed by policy priorities to foster inclusive digital transformation during and post COVID-19. These include policies on digital connectivity, taxation and competition policies, digital payments, skills-development and development of appropriate e-commerce regulations. Policies prioritised by countries will ultimately depend on their level of digital development, sectoral focus and context specific issues. For instance, Cambodia is in process of developing a long-term strategic framework on digital economy and drafting an e-commerce policy. In line with this, Banga and te Velde (2020) highlight a seven-point policy plan for managing inclusive digital transformation in post-COVID recovery (Box 3).

7.1 Digitalisation in economic and policy responses to Covid

Digital technologies can form an important part of low and middle-income countries' response to the pandemic. Figure 13 shows evolution of the COVID-19 Policy stringency index (100= most stringent) in low and middle-income countries, by internet access quartile, and it observed that countries with higher internet access in 2019, were more stringent in their policy responses to COVID-19 i.e. were able to place a greater number of and stricter lockdown-style policies.

Figure 13: COVID-19 Policy stringency index (100= most stringent), by internet access quartiles in low and middle-income countries



Source: Authors (2020)

Note: policy stringency index is from Oxford COVID-19 government response tracker and data on internet access is from World Development Indicators

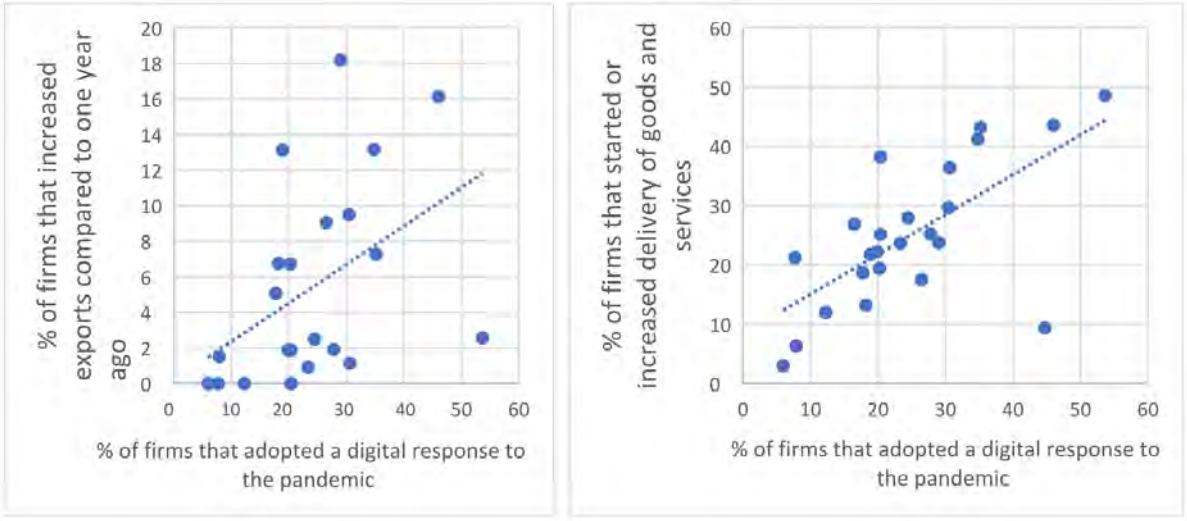
With national lockdowns, closure of schools and pressure on health facilities, digital solutions- particularly in GovTech, EdTech and HealthTech- emerged as crucial solutions in responding to the effects of the pandemic. For instance, e-payment services have made it easier for consumers to pay their bills online and reduce tax evasion, leading to increased government revenue that can be spent on supporting the marginalised sections of the society, particularly during the pandemic. In economies where the pandemic and associated lockdowns weigh heavily on informally employed workers, digital payment systems also provide an alternative modality for ensuring that government relief measures reach the intended beneficiaries (IMF Special Series Note on COVID-19). At least 11 developing countries have temporarily suspended or reduced fees on digital transactions, and governments have issued guidelines to encourage the use of mobile payments during the pandemic (World Bank, 2020). Using digital technologies for expansion of social protection forms a key part of ODI's (2020) case-study on Cambodia's response to COVID-19 (See Box 3).

EdTech and HealthTech are increasingly shaping the education and health services sector during the pandemic, with the effects expected to last in the long run. At least 34 countries have EdTech initiatives including zero-rated internet traffic, e-learning platforms for students and educators, and subsidized access to connectivity and devices (World Bank, 2020). Similarly, over 30 countries have deployed HealthTech in their response to the pandemic, with increasing use of telemedicine, self-diagnosis apps, and dissemination of public health information (zero-rated access to selected sites, bulk SMS, awareness raising videos), including through public-private collaboration (e,.g. Cote d'Ivoire and India). A positive correlation has been found between digital resilience of the State, and its capacity to administer COVID-19 tests (Katz et al., 2020). In addition, infection tracking and contact-tracing tools are helping identify who may have COVID-19, monitor population mobility to understand how it may spread, and predict contagion patterns based on AI models. At least 18 countries have launched public-private collaboration with mobile operators and digital platforms to develop systems and apps that inform public health responses while helping safeguard the privacy of personal information (for example, Israel and Ghana).

Digital technologies also present a viable pathway for mitigating losses for firms and reducing their exposure to demand shocks. Using data from WBES (2020) from 23 countries (covering low, middle and high-income), Figure 14 finds a positive correlation between % of firms in a country that have adopted a digital response to the crisis (increased online business activity) and % of firms that have increased exports compared to one year ago, and those that increased delivery of goods and services. Figure 15 notes a positive correlation between digital response and increased remote work.

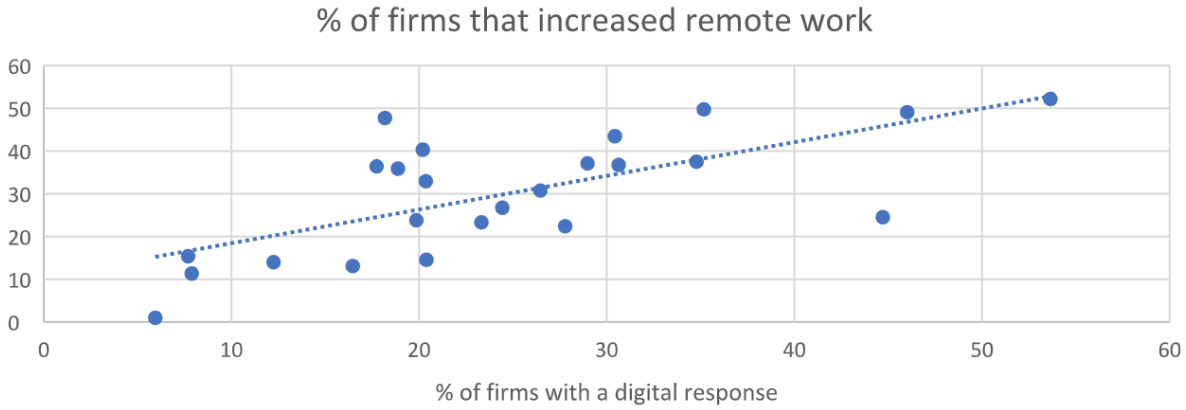
Digital financial inclusion is also emerging as an important channel for firms, especially SMEs, to access loans during the pandemic. Local fin-tech solutions are on the rise; for instance, Xente is an e-commerce and financial services mobile app, based in Uganda, with more than 50,000 subscribers. It allows people to buy goods from marketplaces using methods such as mobile money, credit cards or bank transfers, and to access loans within the app. Following the COVID-19 outbreak, the company waived set-up and commission fees for small businesses for three months, which led to a 10% increase in business-to-consumer transactions and a 200% jump in business-to-business turnover (UNCTAD, 2020b).

Figure 14: Digitalisation and firm resilience to COVID-19 demand shocks



Source: Authors, constructed from WBES (2020) Impact of COVID-19 survey. Data is from 23 countries.

Figure 15: Digitalisation and remote work



Source: Authors, constructed from WBES (2020) Impact of COVID-19 survey. Data is from 23 countries.

While digital technologies offer a range of pathways for mitigating economies losses from COVID-19, it is key to note that not all economies and segments within economies can access equal benefits from them. Using data on fintech use, education and health app downloads and online purchases, Katz et al. (2020) construct a digital household resilience index. The authors find that China, Chile, and Brazil have higher household digital resilience rates compared to the rest of the developing countries. On the other hand, most African countries are at the lower end of the ranking. In most countries the index reaches values lower than 30 (compared to an OECD prorated index of 53.8), suggesting that the ability to educate children, complete financial transactions, and benefit from e-commerce in developing nations is considerably limited. Online learning initiatives, for instance, will be easier only for those with access and will exclude large groups of disadvantaged learners. A large number of learners may have no electricity, some will have a radio but not a television at home, others will have basic feature mobile phones but not smartphones, and others will have only low bandwidth internet available (EdTech Hub, 2020). Even for digitalisation of production, there will be winners and losers; larger corporations are better positioned to leverage already

established digital solutions, such as collaboration tools, employee devices, cloud services, VPN as compared to SMEs (ITU, 2020), who are also less likely to respond through a shift to remote work (World Bank, 2020).

It is therefore important for low and middle-income countries to ensure that the pandemic does not exacerbate or reinforce existing digital divides. This can be achieved through targeted policies for inclusive digital transformation, discussed below.

7.2 Inclusive digital transformation in post-crisis recovery

7.2.1 Targeted policies for expanding digital connectivity

Responsive policies are needed aiming to address digital connectivity shortfalls across low, middle and high-income countries; in Least Developed Countries (LDCs), only around 19% of individuals used the Internet in 2019 (ITU, 2020). Moreover, internet access varies significantly by gender, age and level of education. Youth below 15 years and those in older group have lower internet access than those in the 15-24 age group, with the difference being the starkest in emerging economies (Pew, 2020). Internet penetration in the below 15 age group is as low as 0.5% in Pakistan, 1.5% in Bangladesh, 1.3% Kenya and 1.6% in Nigeria (Commonwealth Secretariat-ODI, 2020). Internet use is also biased towards males in several low and middle-income countries and is higher for people with tertiary education (Commonwealth Secretariat-ODI, 2020). Digital divide in access to internet has also translated into digital divide in internet use; as discussed above, only 2-4% of the population in low and lower middle-income countries is buying online. Even within these countries, e-commerce is biased towards males, youth and people with secondary education or more.

Expanding internet access to marginalised sections of the society is therefore an important first step in inclusive digital transformation in post-crisis recovery. Work-from-home models and rising demand for cloud and other ICT services have led to increased demand for fixed broadband. As a response to the pandemic, some countries have been successful in expanding digital connectivity, including Ghana and Tunisia[21] through allocation of emergency spectrum, and Philippines[22] through lowering of fees for spectrum. In countries where mobiles have outpaced fixed broadband services, or people don't have access to laptops and computers, pre-paid mobile data services offer an alternative way of accessing online services. Both public and private telecom providers have an important role to play in facilitating this. For example, the private telecom company Sonatel, in Senegal, increased bandwidth speed and offered corporate clients 3 GB of mobile data, valid for one month and free of charge, and also enabled students to claim a free 1-GB pass to access education content.[23] In Philippines, the public company PLDT reported a rise of around 400% in wireless offerings increased in the first two week of April, with close to 500,000 new connections.[24]

[21] https://oxfordbusinessgroup.com/news/innovation-heart-covid-19-crisis-tunisia

[22] https://www.commsupdate.com/articles/2020/04/27/dict-to-trim-telcos-wi-fi-spectrum-user-fees/

[23] https://oxfordbusinessgroup.com/news/senegal-turns-ict-combat-covid-19

[24] https://trendingph.net/connectivity-key-to-the-digital-transformation-in-post-covid19/

7.2.2 Facilitating the use of e-commerce through digital trade facilitation and development of e-commerce regulatory frameworks

E-commerce can help mitigate some of the economic losses that low and middle-income countries face in traditional sectors owing to the pandemic but inclusive recovery from the crisis will require targeted efforts for increasing access to digital connectivity and participation on domestic and international digital platforms. Low and middle-income countries are also facing other binding constraints to e-commerce which need to be addressed. These include poorer postal and delivery infrastructure, unclear laws and regulations on taxation, delays in customs and unclear custom procedures, poorer digital skills, lack of inter-operable and reliable online payment systems and low digital trust of consumers. Digital-trade facilitation, automation of customs, digital signature etc can simplify and automate some of the trade-related procedures, which can contribute towards boosting offline and online trade and building economic resilience against pandemic, climate change and other challenges.

The rise in e-commerce, discussed in Section 5, needs to be managed inclusively and appropriately, requiring development of appropriate regulatory frameworks and policies on privacy, data, online dispute resolution, cyber-crime etc. The use of big data in the battle against COVID-19—particularly the use of detailed mobile phone data to track and monitor the pandemic—has further spurred major privacy concerns. As per the UNCTAD cyberlaw tracker 2020, in Africa, 72% of countries have a law against cyber-crime; 61% of countries have an e- transaction law, but only 46% have a consumer protection law; and only 50% of the countries have a privacy and data protection law. Interestingly, to mitigate the economic losses from the pandemic, the top measure taken by countries, mainly LDCs in Africa and Asia-Pacific, is to develop or update a national e-commerce strategy (UNCTAD, 2020c).

Growth in e-commerce and digital payments go hand in hand; UNCTAD's (2020c) survey covering 23 countries, mainly LDCs, shows that nearly 60% of e-commerce companies and 70% of online third-party marketplaces report higher growth rates in mobile money payments, followed by transaction through e-banking and credit cards. In Rwanda, the government has put in place various measures for SMEs, such as removal of transaction fee on digital payments and tax break on essential goods, which have contributed towards ramping up e-commerce in the country; online shopping of consumers has increased by 20% and gross merchandise shopping by 125%.[25] In Indonesia, digital transactions rose by 102.5% year-on-year in the first four months of 2020,[26] while in Kenya, the Central Bank waived fees for financial transfers via mobile banking and Safaricom removed fee for all user-to-user mobile money transactions under $9.42, in addition to increasing the daily transaction limit for SMEs.[27] Nigeria-based Paga and JumiaPay have also both reducing

[25] https://etradeforall.org/app/uploads/2020/05/eWeek2020finalsummaryreportFINALVERSION-4.pdf

[26] https://oxfordbusinessgroup.com/news/does-cash-have-future-after-covid-19

[27] https://techcrunch.com/2020/03/16/kenya-turns-to-its-mobile-money-dominance-to-stem-the-spread-of-covid-19/?guccounter=1

user fees for digital transactions since the start of the pandemic.[28] Membership fees on third-party e-commerce platforms however remain a prominent challenge for MSMEs in Africa, in addition to hefty commission fees charged by these platforms. A survey of 31 companies, mainly SMEs from Kenya, Rwanda and Nigeria, finds that a majority of the companies report an increase in online sales since COVID-19 but predominantly sell through their own e-commerce enabled website. Platforms, such as Jumia, charge 10-15% commission on product sales, in addition to transport and taxes, which pushes up the prices of products for African sellers, making their products uncompetitive (Banga et al., forthcoming).

7.2.3 Increased focus on digital taxation and competition policies

Closely related to digitalisation of businesses is the policy debate on taxation. Many digital business models do not require physical presence in countries where they have sales, reaching customers through remote sales and service platforms. This "remote" participation in the domestic economy enabled by digital means without a taxable physical presence is often seen as the key issue in the digital tax debate (OECD BEPS, 2019). Digital giants, such as Amazon and Google, can exacerbate tax base erosion by transferring their intangible assets (e.g. data; intellectual property) across tax jurisdictions. Data show that only 11 per cent of countries globally apply digital services and content taxes (ITU 2018a). Furthermore, Amazon charges a hefty commission fee (which goes up to 40 per cent on some products such as electronics) but also pushes its own products 75 per cent of the time, decreasing the 'visibility' of products supplied by developing country firms listed on these platforms (The Guardian 2016). The resulting increases in market concentration of digital giants and e-commerce monopolies can exacerbate the digit divide.

The established competition and antitrust policies may no longer be adequate to address the threat posed by e-commerce giants to market competition. These policies are based on the short-term interests of consumers, and view low consumer pricing as indicative of the existence of competition. However, competition can no longer be measured primarily through pricing and output since this runs the risk of ignoring the adverse effects of 'predatory pricing' and the prospect that integration across business lines can be anti-competitive.

With the failure to generate an international consensus on corporate taxation rules for Big Tech companies, several countries have shifted to indirect taxes such as value added tax (VAT) on goods and services sold in the digital marketplace. But practical challenges related to mobilizing VAT from remote sellers still remain (IMF Policy Paper, 2019). Some middle-income countries have devised approaches to tax digital services. Malaysia, for instance, introduced a 6% digital tax on January 1, 2020. The Indonesian government, expecting a 10% drop in revenue, has moved its tax base towards digital taxation by imposing a 10% value-added tax (VAT) in July 2020 on goods and services sold through electronic platforms that do not have a physical presence in the country, including online retail, streaming media, e-learning, apps, and cloud services.[29] Similarly,

[28] https://atalayar.com/en/content/how-can-digital-solutions-aid-nigeria%E2%80%99s-covid-19-fight

[29] https://www.reuters.com/article/us-indonesia-tax-digital/indonesia-imposes-10-vat-on-amazon-google-netflix-and-spotify-idUSKBN2481A5

in India, the government introduced a 2% tax on digital services provided by foreign companies, covering streaming services as well as e-commerce revenues on sites such as Amazon.[30] Kenya's New Financial Bill, 2020, also proposes that revenue from services provided through a digital marketplace in Kenya will be taxed at the rate of 1.5% on the gross transactional value.[31]

However, a poorly implemented digital services taxation policy can undermine growth of the domestic digital economy. Policies that support domestic e-commerce players are also important for low-income countries, which are at relatively nascent stages in terms of digitisation. Therefore, more focus needs to be diverted towards enabling firms and suppliers in these countries to link up with regional and international platforms. Mendez-Parra et al. (2019) examine Nigeria–UK trade and investment relations and highlight e-commerce as a major opportunity to overcome many of the trade barriers between the two economies in terms of both goods and services trade. Currently, there is limited trade between the UK and Nigeria commercialised through e-commerce; the bilateral trade through e-commerce is generally limited to products imported through traditional channels that are commercialised through internet platforms in the respective countries. Products are sent from warehouses and other storage facilities located in the respective countries, with very little genuine direct imports from consumers (B2C e-commerce). Despite the presence of a sizable British Nigerian community in the UK, Jumia has not opened a UK version of its website to allow UK-based customers to buy directly from Nigerian companies. It is important not to underestimate the role of Nigeria as a foreign investor – Nigerian firms and conglomerates like Dangote are increasingly becoming major regional and continental investors, even in the area of e-commerce.

7.2.4 Increasing focus on digital skills-development

Rise in tele-working, tele-medicines, tele-education, social distancing, e-commerce, online gaming etc. has increased the importance of developing digital skills for increasing resilience to shocks such as the pandemic. A survey of 68,574 youths, aged 16- 35, from six countries in ASEAN, reveals that 87% of youth increased usage of at least one digital tool during the pandemic and 42% of youths picked up at least one new digital tool (WEF ASEAN survey, 2020). Moreover, the survey found a significant surge in the usage of online education, business-related services, online entertainment, as well as e-payments and e-commerce; across ASEAN, 33% of entrepreneurs utilised e-commerce for selling more actively during pandemic. Indonesia and Singapore generally saw a larger boost to digital tool adoption; more than 50% of youths in these two countries increased e-commerce buying during COVID-19. The number of users on African Development Bank's Coding for Employment platform (CfE) e-learning platform also witnessed a sharp spike in online learning; the number of users rise by 38.5% to 9,000 within one week.[32]

[30] https://www.thephuketnews.com/can-digital-taxes-help-fund-the-covid-19-recovery-in-emerging-markets-76498.php

[31] https://techcabal.com/2020/07/03/kenya-digital-taxes/

[32] https://moderndiplomacy.eu/2020/06/19/the-relevance-of-digital-skills-in-the-covid-19-era/

However, as per ILO (2020), globally only 18% of workers work in occupations and live in countries with the infrastructure for effectively working from home, with important differences across income groups; while 27% of people in high-income countries can work from home, this falls down to 16% for middle-income and 12% for low-income countries. The scope of work from home also differs across sector; there is low scope in accommodation and food services, transportation, wholesale and retail trade, health and social services, and manufacturing sectors. In contrast, IT and IT enabled sectors such as the information and communication, finance and insurance and professional services (e.g., legal services and scientific research), typically require less physical proximity and have higher reliance on digital tools and technologies.

To meet the rising demand for digital skills in post-COVID-19 recovery, low and middle-income countries need to focus on increasing the supply of these skills through formal education and TVET (formal, non-formal) and equipping the current workforce with relevant skills through trainings. In education, a range of countries have adopted e-learning strategies. For instance, Kenyan, Egyptian and Nigerian educational systems now facilitate access to materials and programs through cloud services, radio, television, and social media platforms.

Box 3: Cambodia, COVID-19 and a seven-point digital transformation plan

1. Radically transform innovation in the manufacturing sector to leverage technology. A new incentives package (offering an ecosystem that encourages digital technology) can help attract technologically more intensive investment, encourage upgrading technology in factories and promote relevant skills. It could also embrace the concept of digital small and medium enterprise clusters.

2. Provide appropriate and good quality skills for the future. Bringing new dynamism into the sector skills councils to embrace a digital economy would be a helpful, targeted measure. There will also need to be more emphasis on education through digital means.

3. Nurture the digital start-up economy for an inclusive economy. New incentives by the government for collective action by start-ups could redirect some efforts to develop apps with relevant applications for the poorest. According to the Ministry of Commerce, the government has reduced the cost of registration by 40% to ease the burden of formalization for start-ups (UNCTAD, 2020).

4. Facilitate targeted digital infrastructure development to enable the most vulnerable groups to take part in the digital economy. Cambodia has very low fixed-broadband penetration and low mobile broadband penetration compared with other Asian economies, and its market is currently dominated by low-quality residential broadband services.

5. Ensure a public sector that leads by example; manage the process towards a new framework for a digital economy in a coordinated way- for instance, the government is finalising an e-commerce strategy for Cambodia with the support of the Enhanced Integrated Framework, involving various key ministries. It is also important for the government to progress on e-governance and electronic services by accelerating efforts towards adopting its e-Government Master Plan 2017–2022. E-government services can lead to increased government revenue, which can be spent on support to the poor, particularly during the pandemic.

6. Digitalise trade facilitation and boost e-commerce to build economic resilience against the pandemic. The Ministry of Commerce, for instance, announced on 7 May 2020 to all producers and exporters of goods to Association of Southeast Asian Nations (ASEAN) markets that the certificate of origin for exporting goods to ASEAN can be filled in online (e-Form D) from 1 June 2020. Legal and regulatory frameworks for electronic transactions and signatures need to be put in place.

7. Use digital technologies to extend social protection mechanisms to the most vulnerable, who are most at risk of losing their jobs owing to the pandemic. In the longer term, digital technologies can help support an increasingly harmonised social protection system, which can facilitate better coordination across IDPoor, NSSF and other cash transfer and social assistance programmes.

Source: ODI, (2020)

8. Conclusion

This paper examines how the pandemic and other external factors and policy settings have affected segments of the digital economy, in addition to analysing appropriate policies to leverage benefits of digitalisation for inclusive post-crisis recovery. It is well-documented that there is a persistent global digital divide; low and middle-income countries continue to lag behind high-income economies in several aspects of digitalisation, from internet access to automation, and also benefit less from these digital technologies due to poorer overall complementary infrastructure and skills. There is thus a risk of the pandemic creating new or exacerbating existing inequalities in the digital economy. Given this, the study attempts to understand how the digital economy can be leveraged to foster inclusive development in low and middle-income countries and boost economic resilience during the ongoing pandemic. Analysis is carried out for four sub-segments of the digital economy; a) digital infrastructure and ICT goods; b) ICT and ICT-enabled services; c) e-commerce; and d) online work.

Digital infrastructure is witnessing a positive demand shock due to business shifting online and consumers working from home. This shock is however expected to be lower in low and middle-income countries, where the informal sector constitutes a large share of economic activities, thereby limiting the enforcement of social distancing and work from home arrangements. Moreover, increased demand for internet access in LICs and MICs is largely met through degradation in overall broadband speed, which can in turn have negative impact on GDP growth. Furthermore, compared to HICs, LICs and MICs are likely to witness larger (negative) supply-side shocks due to travel bans and lockdowns leading to shortages in imported materials. These economies have a lower domestic capability of substituting imports. Suspension of manufacturing activities and social distancing policies are likely to create a higher magnitude of supply-side shocks in ICT manufacturing segments which are labour intensive. It is well-documented that robot density across manufacturing sectors is higher in developed countries of US, UK, German etc. than developing economies of India, Brazil and South Africa (IFR, 2020).

ICT and ICT-enabled services hold some potential for recovery for LICs and MICs. There is a rising demand for digital services, particularly cloud services, data hosting services, data storage services as well as digital products like video games, online streaming, digital animation etc. The supply of these services (mostly online) is also more resilient to any voluntary and selectively imposed social distancing once lockdowns get lifted. However, the share of ICT and ICT-enabled services in total services exports in some LICs and MICs is below 20%. For cloud and data related services, most of these economies continue to rely on global service providers, mostly located in the US. During the pandemic, worsening of broadband speeds has compounded the difficulties faced by LICs and MICs in leveraging domestic cloud service industry.

There is evidence that several African and Asian retailers are using e-commerce to cope with loss of sales through traditional channels (in-store) during the pandemic. However, e-commerce revenues remain relatively small, and accrue more to physical retailers engaged in online selling compared to pure-play e-commerce retailers (or e-tailers), which sell goods and services online through an online channel only with no physical stores. Overall, only 2-4% of the population in low and lower

middle-income countries is buying online, with significant differences across gender, age and education, limiting the potential of e-commerce in crisis recovery. On supply side, the pandemic has caused disruptions to logistics, transport and postal sectors. These shocks will adversely affect e-commerce opportunities in LICs, which already have a poor delivery infrastructure.

While the pandemic has affected segments of the digital economy differently, the digital economy is emerging as a critical pillar in the economic and policy response to the pandemic by firms and governments. New analysis conducted in the paper using World Bank's Enterprise Survey 2020 for selected African countries shows that in all three sectors- manufacturing, retail and other services – firms with a digital response to the pandemic are faring better than those without a digital response. Governments with a higher digital penetration in 2019 were at the outset able to impose stricter policies to curtail the spread of COVID-19, with ed-tech, health-tech and gov-tech emerging as key solutions in service delivery during the pandemic.

To leverage digital transformation for inclusive post-crisis recovery, responsive and targeted policies are needed. These include policies on expanding digital connectivity to marginalised sections of the society; developing appropriate regulatory frameworks and policies on privacy, data, online dispute resolution, cyber-crime etc for boosting e-commerce; enabling firms and suppliers to link up with regional and international platforms; leveraging digital solutions; improving supply of digital skills through formal education and TVET (formal, non-formal) and equipping the current workforce with relevant skills through trainings.

References

1. A.T. Kearney (2020). Trade war spurs sharp reversal in 2019 Reshoring Index, fore-shadowing COVID-19 test of supply chain resilience. Available at https://www.southeast-europe.kearney.com/web/guest/operations-performance-transformation/us-reshoring-index.

2. Available at https://www.unwto.org/news/covid-19-international-tourist-numbers-could-fall-60-80-in-2020

3. Baldwin, R. and Weder di Mauro, B., 2020. Economics in the Time of COVID-19. CEPR. Available at https://cepr.org/sites/default/files/news/COVID-19.pdf

4. Balleer, A, S Link, M Menkhoff and P Zorn (2020), "Demand or supply? Price adjustment during the Covid-19 pandemic," *Covid Economics* 31, 23 June.

5. Banga, K. and te Velde, D.W., (2018). Digitalisation and the Future of Manufacturing in Africa. *Overseas Development Institute*, London.

6. Banga, K. and te Velde, D.W., 2020. Cambodia, COVID-19 and inclusive digital transformation: a sevenpoint plan. *Supporting Economic Transformation*. London.

7. Banga,K. (2020). Can the digital economy help mitigate the economic losses from COVID-19 in Kenya. *Supporting Economic Transformation*. London.

8. Banga, K., Gharib, M., Mendez-Parra, M. and Macleod, J. '(forthcoming) E-commerce in Preferential Trade Agreements; implications for African firms and AfCFTA. ODI working paper.

9. Borneo Post (2020). What does the Covid-19 outbreak mean for the Philippines' BPO sector? Available at https://www.theborneopost.com/2020/05/24/what-does-the-covid-19-outbreak-mean-for-the-philippines-bpo-sector/

10. Brinca, P, J B Duarte and M Faria-e-Castro (2020), "Measuring Sectoral Supply and Demand Shocks during COVID-19", Covid Economics, Issue 20, London: CEPR Press.

11. Brown, P. (2020) COVID-19 worries expand robot use in semiconductor manufacturing. Available at https://electronics360.globalspec.com/article/15239/covid-19-worries-expand-robot-use-in-semiconductor-manufacturing.

12. Cable.co.uk (2020). How global broadband speeds changed during COVID-19 lockdown periods. Available at https://www.cable.co.uk/broadband/speed/broadband-speeds-covid-19-lockdown/

13. Carew, D., Martin, N., Blumenthal, M., Armour, P., and Lastunen, J. (2018). The potential economic value of unlicensed spectrum in the 5.9 GHz Frequency band: insights for allocation policy. RAND Corporation.

14. Covid-19 E-commerce Insight. Available at https://insights.emarsys.com/

15. DATABD.co (2020). Delivery Services in Bangladesh: Coping with COVID-19. Available at https://databd.co/stories/delivery-services-in-bangladesh-coping-with-covid-19-12228

16. EdTech Hub (2020). Education during the COVID-19 crisis: Opportunities and constraints of using EdTech in low-income countries. Available at https://edtechhub.org/coronavirus/edtech-low-income-countries/

17. Farrell, N. (2020). China's ICT spending in 2020 set to decline by 7.6 percent. Available at https://fudzilla.com/news/51185-china-s-ict-spending-in-2020-set-to-decline-by-7-6-per-cent

18. Global Findex Report (2017). World Bank. Available at https://globalfindex.worldbank.org/

19. Graham, M., Hjorth, I. and Lehdonvirta, V., 2017. Digital labour and development: impacts of global digital labour platforms and the gig economy on worker livelihoods. Transfer: European Review of Labour and Research, 23(2), pp.135-162.

20. Hasan, A. (2020). The growth of e-commerce during the pandemic in Bangladesh. Available at https://www.newagebd.net/article/114200/the-growth-of-e-commerce-during-the-pandemic-in-bangladesh

21. Howe, J. (2020). Blog: The e-commerce response to COVID-19. ITC. Available at https://www.intracen.org/covid19/Blog/The-e-commerce-response-to-COVID-19/

22. https://www.bsg.ox.ac.uk/research/research-projects/coronavirus-government-response-tracker

23. IFC (2020) What COVID-19 Means for Digital Infrastructure in Emerging Markets. Available at https://www.ifc.org/wps/wcm/connect/8f9237d2-eceb-433f-a2d0-300907808722/EMCompass_Note_83-for+web.pdf?MOD=AJPERES&CVID=n7M5wS.

24. IMF (2020). A Crisis Like No Other, An Uncertain Recovery. World Economic Outlook. Available at https://www.imf.org/en/Publications/WEO/Issues/2020/06/24/WEOUpdateJune2020

25. IMF Special Series Note on COVID-19 (2020). Options to Support the Incomes of Informal Workers During COVID-19. Available at https://www.imf.org/en/Publications/SPROLLs/covid19-special-notes

26. ITU (2020) Economic impact of COVID-19 on digital infrastructure Report of an Economic Experts Roundtable organized by ITU. Available at https://www.itu.int/dms_pub/itu-d/opb/pref/D-PREF-EF.COV_ECO_IMPACT-2020-PDF-E.pdf

27. KAM and KPMG (2020) The impact of Covid-19 on the manufacturing sector in Kenya. Available at https://kam.co.ke/kam/wp-content/uploads/2020/05/KPMG-KAM-Survey-The-impact-of-Covid-19-on-the-manufacturing-sector-in-Kenya_FINAL_19May2020-1.pdf

28. Kässi, O., & V. Lehdonvirta (2018), Online Labour Index: Measuring the Online Gig Economy for Policy and Research. Technological Forecasting and Social Change 137, pp. 241–248.

29. Kässi, O., Hadley, C. and Lehdonvirta, V. (2020) 'Online labour index: measuring the online gig economy for policy and research'. Dataset (https://doi.org/10.6084/M9.FIGSHARE.3761562).

30. Katz, R., and Callorda, F. (2019). Assessing the economic potential of 10G networks. New York: Telecom Advisory Services.

31. Katz, R., Callorda, F., and Jung, J., (2020). Can digitization mitigate COVID-19 damages? Evidence from Developing Countries. Available at http://www.teleadvs.com/wp-content/uploads/SSRN-id3600829.pdf

32. KNBS – Kenyan National Bureau of Statistics (2020) 'Quarterly gross domestic product report: first quarter, 2020'. Nairobi: KNBS (www.knbs.or.ke/?wpdmpro=quarterly-gross-domesticproduct-report-first-quarter). Kurian, C. and Kapoor, K. (2020)

33. Lehdonvirta, V. (2018), Flexibility in the Gig Economy: Managing Time on Three Online Piecework Pplatforms. New Technology, Work and Employment 33, pp. 13–29.

34. Liew, V.K.S., (2020). The effect of novel coronavirus pandemic on tourism share prices. *Journal of Tourism Futures*.

35. Melia, Elvis (2020): African jobs in the digital era: Export options with a focus on online labour, Discussion Paper, No. 3/2020, ISBN 978-3-96021-114-3, Deutsches Institut für Entwicklungspolitik (DIE), Bonn, http://dx.doi.org/10.23661/dp3.2020

36. MOBILE world live (2020) Vodacom data traffic surges during lockdown. Available at https://www.mobileworldlive.com/featured-content/top-three/vodacom-data-traffic-surges-during-lockdown

37. OBG (2020). Video games and Covid-19: the impact in emerging markets. Oxford Business Group. Available at https://atalayar.com/en/content/video-games-and-covid-19-impact-emerging-markets

38. OBG (2020b). The Philippines' IT-BPO industry continues to diversify and add value. Oxford Business Group. Available at https://oxfordbusinessgroup.com/analysis/know-growing-investment-higher-value-outsourcing-services

39. OBG (2020c) What does the Covid-19 outbreak mean for the Philippines' BPO industry. Oxford Business Group. Available at https://oxfordbusinessgroup.com/news/what-does-covid-19-outbreak-mean-philippines-bpo-industry

40. OBG (2020d) E-commerce provides economic boost for Indonesia as shoppers migrate online during the Covid-19 pandemic. Available at https://oxfordbusinessgroup.com/news/e-commerce-provides-economic-boost-indonesia-shoppers-migrate-online-during-covid-19-pandemic?utm_source=feed&utm_medium=rss&utm_campaign=eus_all_all

41. ODI – Overseas Development Institute and CDRI – Cambodia Development Resource Institute (2020) 'Fostering an inclusive digital transformation in Cambodia'. London: SET

42. OECD -BEPS (2019). ADDRESSING THE TAX CHALLENGES OF THE DIGITALISATION OF THE ECONOMY. Available at https://www.oecd.org/tax/beps/public-consultation-document-addressing-the-tax-challenges-of-the-digitalisation-of-the-economy.pdf.

43. Oxford COVID-19 Government Response Tracker (OxCGRT)

44. Pathways for Prosperity Commission, 2018. Charting pathways for inclusive growth: from paralysis to preparation.

45. Paul, E. (2020) Nigeria hit 2.5 million new Internet subscriptions during the lockdown. Available at https://techpoint.africa/2020/07/10/nigeria-internet-subscriptions-lockdown/

46. Reports Globe (2020). 3D Animation Market Size, Revenue, Growth, Trend & Forecast Analysis, 2020. Available at https://reportsglobe.com/product/3d-animation-market/

47. Sanna Ojanperä and Mark Graham, 2019. "Mapping the availability of online labour in 2019," *Oxford Internet Institute*, at https://geonet.oii.ox.ac.uk/blog/mapping-the-availability-of-online-labour-in-2019/, accessed 6 June 2019.

48. Seric, A. and Winkler, D. (2020). COVID-19 could spur automation and reverse globalisation – to some extent. Available at https://voxeu.org/article/covid-19-could-spur-automation-and-reverse-globalisation-some-extent

49. Shingal, A. (2020) 'Services trade and COVID-2019'. Available at https://voxeu.org/article/services-trade-and-covid-19

50. Stephany, F., Dunn, M., Sawyer, S. and Lehdonvirta, V., 2020. Distancing bonus or downscaling loss? The changing livelihood of US online workers in times of Covid-19.

51. UNCTAD (2018). Effective Market Access for LDC Services Exports – Is the LDC Services Waiver Being Implemented? Available at https://unctad.org/system/files/official-document/ditc_2018-03-06_Case%20studies_en.pdf

52. UNCTAD (2019). Digital Economy Report 2019. Available at https://unctad.org/system/files/official-document/der2019_en.pdf.

53. UNCTAD (2020). Cambodia's digital startups help blunt economic impact of COVID-19. Available at https://unctad.org/news/cambodias-digital-startups-help-blunt-economic-impact-covid-19

54. UNCTAD (2020b). Ugandan e-commerce platforms power recovery from COVID-19 crisis. Available at https://unctad.org/news/ugandan-e-commerce-platforms-power-recovery-covid-19-crisis

55. UNCTAD e-trade readiness report (2019). Bangladesh Rapid eTrade Readiness Assessment. Available at https://unctad.org/system/files/official-document/dtlstict2019d6_en.pdf

56. UNCTADstat (2020). Available at https://unctadstat.unctad.org/EN/

57. UNCTAD (2020c) Covid-19 and E-commerce. Impact on businesses and policy responses. Available at https://unctad.org/system/files/official-document/dtlstictinf2020d2_en.pdf

58. UNWTO (2020). INTERNATIONAL TOURIST NUMBERS COULD FALL 60-80% IN 2020, UNWTO REPORTS.

59. Uswitch (2020) Communication apps usage nearly doubles during lockdown. Available at https://www.uswitch.com/mobiles/news/2020/05/communication-apps-usage-nearly-doubles-during-lockdown/

60. WBES (2020) Impact of Covid Survey. World Bank.

61. WEF (2020). Shaping the Future of Digital Economy and New Value Creation.

62. WEF (2020b). How COVID-19 is taking gaming and esports to the next level. Available at https://www.weforum.org/agenda/2020/05/covid-19-taking-gaming-and-esports-next-level/

63. World Bank (2020). COVID-19: We're tracking digital responses worldwide. Here's what we see. Available at https://blogs.worldbank.org/digital-development/covid-19-were-tracking-digital-responses-worldwide-heres-what-we-see

64. World Trade Report (2019). The future of services trade. WTO. Available at https://www.developmentaid.org/api/frontend/cms/file/2019/10/00_wtr19_e.pdf

65. WTO Services Trade Barometer (2020). Services trade barometer signals resilience in key sectors amid overall decline. Available at https://www.wto.org/english/news_e/news20_e/wtoi_17sep20_e.htm

66. Xalam Analytics (2018). The Rise of the African Cloud. Available at https://xalamanalytics.com/research/investor-reports/the-rise-of-the-african-cloud/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