Section 3  Charting the Course for a Sustained Recovery in Africa

The COVID-19 pandemic has taken a heavy toll on human life worldwide. In Sub-Saharan Africa, the health impact has not been as devastating. As of end-September, the region had one confirmed case for every thousand people and about 25,000 deaths. Excluding South Africa, these numbers are even smaller (four cases for every million people and nearly 8,400 deaths). Lessons from the Ebola crisis and other previous pandemics in the region enabled policymakers to rapidly launch effective public health campaigns rapidly and impose stringent containment measures—including airport screenings, curfews, banning mass gatherings, and international travel restrictions. Innovative solutions also played a role. However, the health crisis it not over yet and governments need to continue strengthening their public health systems.

The COVID-19 pandemic, on the other hand, has severely impacted economic activity in Sub-Saharan Africa —thus, jeopardizing a decade of hard-earned economic and social progress. The pandemic is pushing the region into its first recession in the past quarter century. Real gross domestic product (GDP) is expected to contract by 3.3 percent in 2020. This downturn in economic activity will cost the region US$ 115 billion in terms of output losses (relative to a no-COVID-19 scenario). Beyond the much-needed relief measures to fight the pandemic, the policy toolkit should include policies that build greater resilience, boost productivity, and generate jobs. Charting the course for a steady recovery in Sub-Saharan Africa in the post-COVID-19 pandemic requires an agenda that embarks African countries on a path of sustained and inclusive productivity-driven growth that creates, more, better, and inclusive jobs —including for lower-income, lower-skilled people.

The Jobs and Economic Transformation (JET) agenda provides a policy framework that rests on two pillars; namely, creating and connecting to markets, and building capabilities and connecting workers to jobs. Under the first pillar, there is a series of cross-cutting policy areas that can boost investment:

(a) Strengthening the macroeconomic policy framework and the enabling environment to provide incentives for private investment—including transparency;

(b) Supporting the enabling sectors to boost productivity and connect firms to larger markets—including raising the depth and resilience of domestic financial sectors and providing affordable, reliable, and sustainable infrastructure and ecosystem services; and

(c) Strengthening governance and institutions, implementing sound public investment management systems, and guaranteeing environmental sustainability.

Under the second pillar, the cross-cutting policies include:

(a) Supporting human capital accumulation to improve labor productivity, and

(b) Implementing labor market reforms and the provision of basic social protection to support transitions.

Efficient implementation of such policies would enable African economies to recover faster and thrive in the post-COVID-19 world.

Box 1 summarizes the innovative responses to the COVID-19 pandemic in Mauritius and Senegal.
The economic transformation of the region requires addressing the different drivers of productivity (including their cross-cutting foundations), and the policy priorities should be tailored according to the country context. In turn, the policy priorities should operate through three core and inter-related transformations (sectoral transformation, technological transformation, and rural-urban linkages) to put countries on a high and inclusive path of economic growth (figure 3.1).

Cross-Cutting Foundations to Boost Productivity and Job Creation

A series of cross-cutting policies that expand investment in physical and human capital are critical to build the foundations of the JET policy agenda. This section briefly discusses the importance of sound macroeconomic and fiscal frameworks, the quality of institutions and human capital development.

Sound macro-fiscal frameworks. Strengthening the macro-fiscal policy framework can help achieve macroeconomic stability and create fiscal space to finance government policies—including investment programs. It allows economic agents to focus on productive activities, expands the average planning horizon of investment decisions and increases the maturity of private and public borrowing. The global pandemic is putting pressure on already stressed macro policy frameworks, particularly for those governments with mounting fiscal pressures and heightened debt vulnerabilities. The fiscal cost of the policy response to COVID-19 pandemic implemented by countries in the region is massive and has put the sustainability of public finances at risk. The pandemic is further weakening government balance sheets. Still, charting

2 Issues of transparency and accountability of rules, procedures, and practices of fiscal policymaking are briefly discussed in section 1.
the course for a rapid recovery will require massive investments and governments may need to rebuild their fiscal pace to help finance those investments. Section 1 summarizes some of the actions from the revenue, expenditure and public debt side that African governments may need to implement to generate the much-needed fiscal space.³

**Institutional quality.** Government effectiveness to design and implement policy responses to the crisis and the level of public trust in government are critical to fight the COVID-19 pandemic—and, especially so in countries affected by fragility, conflict, and violence.⁴ Recent studies examine the role played by public attention on the implementation of nonpharmaceutical interventions (NPIs) by governments to contain the COVID-19 pandemic. It was found that the positive impact of public attention on policy implementation is primarily driven by countries with good institutions (Aksoy et al. 2020). One of the lessons from the pandemic is the need to adopt government operations, service delivery, and interactions with citizens for modernization of services for citizens and businesses. Digital tools play a key role here. Finally, policymakers in the region can use a social contract framework to diagnose and explain severe development obstacles such as the low quality of institutions and the ineffectiveness of past institutional reforms. The COVID-19 crisis represents an opportunity for African countries to drive a reform agenda that applies such social contract lens. It should aim at enhancing the response capacity of the State’s as well as the trust of its citizens. Deploying effective communication strategies, engaging the community, and reaching consensus with all stakeholders in society are critical (De Waal 2020). Achieving inclusive productivity-driven growth requires a policy framework that places African citizens at the center of the reform effort as beneficiaries and stakeholders with agency (World Bank 2020m).⁵

**Human capital.** Investments in human capital of the (current and future) workforce play a key role in the road to recovery in Sub-Saharan Africa while countries prioritize policy actions to address the challenge of creating more, better and inclusive jobs. Policies fostering knowledge and skill accumulation can boost productivity by facilitating the adoption of productivity-enhancing technologies or enhancing the ability to develop new ones. However, lockdown measures to contained the pandemic coupled with school closures and disruptions in basic health services are having a negative impact on the accumulation of human capital in the short and long term. The pandemic threatens to erode the education of young Africans—especially girls.⁶ Education continuity is critical for productivity and competitiveness. Prolonged interruptions in the provision of education or a severe deterioration in quality will harm the region’s long-term productivity and competitiveness. Estimates of learning loss due to COVID-19 already paint an alarming picture for young Africans. In an scenario of four months of lost schooling and no change in educational quality, the lifetime earnings of today’s students across the globe will be sharply reduced, representing a loss of 12.4 percent of the world’s GDP over future generations (Psacharopoulos et al. 2020).⁷

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3 Africa’s fiscal space can also be expanded by addressing the problem of illicit financial flows. Recent estimates suggest that illicit capital flight from the region amounts to US$ 88.6 billion (3.7 percent of GDP) per year, an amount that is comparable to the sum of foreign aid and direct investment (UNCTAD 2020).

4 In countries affected by fragility, conflict, and violence the effort to advocate for sanitary protective measures amid pandemics and support income losses within the community is often led by self-organizing citizens, community groups, civil society organizations, and faith-based organizations.

5 Section 1 highlights the importance of strengthening public investment governance to raise the effectiveness of such spending.

6 The pandemic is also disrupting the supply and demand for essential primary health and nutrition services (such as family planning, ante- and post-natal care, attended births, child vaccinations, and other lifesaving care). For instance, fears of contracting COVID-19 are preventing parents from taking their children to health care facilities in Liberia. Some pregnant and lactating mothers have elected to postpone antenatal services and routine immunizations for fear of contracting the virus in Ghana (GFF and World Bank 2020).

7 The global estimates extrapolate the costs in future earnings of four months of lost education in the United States. They were estimated at US$ 2.5 trillion, an equivalent of 12.7 percent of US annual GDP.
Sub-Saharan Africa already has significantly lower levels of human capital development relative to other regions—as captured by shortcomings in education (expected years of schooling and harmonized test scores) and health (survival rates and stunting). The region registered a Human Capital Index (HCI) level of 0.4 in 2020; thus, implying that a child born today will be only 40 percent as productive as a future worker if she were to enjoy complete education and full health. When compared with other developing regions, the HCI suggests that a Sub-Saharan African child is expected to be only 58 percent as productive as a future worker as a child in Europe and Central Asia (World Bank 2020). Further deterioration of human capital during the pandemic will widen prospective productivity gaps between workers in Sub-Saharan Africa vis-à-vis other regions.

Learning losses will adversely affect long-term productivity if governments are unable to ensure the continuation of educational activities during the pandemic. Estimates suggest that less than ¼ of low-income countries provide any type of remote learning opportunities—with the majority using television and radio—as opposed to nearly 90 percent of high income countries—with most of them being provided online. In Sub-Saharan Africa, only 11 percent of countries rely exclusively on online opportunities, and only 23 percent use a combination of online and broadcast (Vegas 2020). Interactive radio instruction can be effective if it is well-designed. The government of Malawi is working with civil society organizations to provide effective literacy and numeracy instruction using solar-powered offline tablets (Bernard et al. 2020).

Human capital and skill development is a cross-cutting enabler for the JET agenda that operates through the three transformation: human capital and skills are key for a productivity-enhancing transformation within and across sectors of economic activity (including strengthening urban-rural linkages) and for seizing the opportunities of the digital transformation of the region while addressing the gender divide. 

Addressing Productivity-Enhancing Growth and Job Creation

Accelerating economic transformation is needed in Sub-Saharan Africa to create more and better jobs. The JET agenda aims to prioritize and support policies and investment that foster country-specific economic transformation that can best help to address a country’s job challenges.

The first transformation, sectoral reallocation, boosts productivity by shifting resources from less to more efficient job-creating activities across farm, manufacturing plants and services firms while incentivizing trade-related specialization. Sectoral reallocation policies include actions to foster market contestability (i.e. enabling more flexibility in the entry/exit of firms), promoting foreign trade and foreign direct investment (FDI) to expose firms to competition and alleviate constraints to financing innovation, and promote the participation in global value chains (GVCs)—including regional value chains while building the foundations and capabilities to promote comprehensive continental involvement. Sectoral reallocation involves a shift of resources towards modern economic sectors, i.e. economic activities that are not only less volatile but also are characterized by greater value addition (for example through GVCs). Participation and upgrading along GVCs would require job creation for skilled workers and for the large, unskilled workforce through greater

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8 This proportion rises to 68 percent when compared with East Asia and the Pacific.
9 These figures estimate the use of remote learning to continue basic education (K-12) in light of school closures across countries.
10 Volume 18 of the Africa’s Pulse highlights the importance human capital in boosting productivity of Sub-Saharan African countries. In particular, it argues that the human capital in the region might not be allocated to its most productive use. Inefficiencies in the allocation of talent are often influenced by distortions in the labor market (say, onerous firing costs and discrimination), barriers to human capital investment (e.g. restricted access to finance, entry costs, and taxation), and social norms (say, community-based, non-market mechanism for land allocation). From a dynamic perspective, the lower productivity as a result of allocative distortions will further harm the accumulation of human capital. For instance, policies that distort the allocation of credit or land may disincentivize firms or farmers from undertaking productivity-enhancing investments —say, research and development investments and the adoption of best technologies/practices, among others. Overall, the low productivity of Sub-Saharan African countries is attributed to low levels of human capital, and this effect is compounded by the misallocation of human capital across occupations and production units.
specialization in low-skill activities in the value chain. Policies to boost competitiveness is critical for creating jobs through GVC participation. The full implementation of the African Continental Free Trade Area (AfCFTA) would help by addressing tariffs, non-tariff barriers (NTBs), and trade facilitation problems, as well as attracting foreign investments. The AfCFTA can stimulate the development of regional value chains by expanding trade and organizing production across the region, thus building resilience along supply chains. This includes securing supply chains of essential goods at the national and regional levels in the midst and the aftermath of the pandemic. An effective implementation of the AfCFTA calls for regulatory reforms, and capacity building of the institutions enforcing the treaty’s obligations. The full implementation of the treaty would be enhanced by complementary policies that facilitate labor mobility across borders in the region as well as financial resources (for example, reducing the cost of remittances).

The second economic transformation focuses on the importance of economywide technological upgrading in driving productivity growth. This section focuses on one of the dimensions of the technological transformation—that is, the adoption of digital technologies. The digital transformation of the region can unlock its potential for growth, innovation, job generation and the continuous provision of services. Digital technologies have been found to improve household welfare and boost firms’ productivity and job creation. Yet, access to the internet is low among households and firms in Sub-Saharan Africa. Policies that address digital infrastructure gaps, affordability (of devices and services) and digital literacy are critical to expand access to digital technologies and reduce the digital divide across gender, firm size, and urban-rural areas. The regulatory framework should provide the right incentives for rapid digital technology adoption and increased competition among mobile operators—including measures to attain universal affordable access to high-quality communications services, support of critical functions (say, hospital emergency services and e-government), public warning systems, and high network resilience (cybersecurity). Digital skills, which rest on foundational human capital, are often linked to better opportunities and yet they are not fully exploited. Ensuring inclusiveness in the provision of digital skills, at different levels, will be crucial to prevent the exclusion of already marginalized segments of the population from the benefits of connectivity—including women, rural areas, and micro, small, and medium-size enterprises (SMEs). Finally, adequate analog complements are critical to reap the benefits of the digital economy. Reforms to improve the reliability of the electricity supply and investments in a range of complementary non-digital technologies are essential.

The third transformation, spatial integration, involves policies that foster the reallocation of resources from less to more efficient job-creating locations through enhanced rural-urban integration, regional (inland-coastal) connectivity, and well-functioning cities that encourage production in tradable industrial and service sectors. An important aspect of Africa’s urbanization challenge has been the lack of opportunities in the countryside. Boosting agricultural productivity and improving the living conditions in rural areas—including food security—will play a critical role. Segmented markets and disrupted food supply chains have led to severe supply and demand mismatches in traditional markets. Digital platforms offer producers and consumers greater connectivity, improve efficiency and lead to greater transparency in the food logistics system. At the same time, constraints should be relaxed to encourage urban development at scale and for scale, while fostering economic specialization. These include stimulating land markets, clarifying property-rights, and rightsizing zoning regulations. Finally, across the spatial landscape, investment planning across urban and rural areas requires scaling up infrastructure spending—particularly, enhancing access to basic infrastructure services.
3.1 STRUCTURAL CHANGE AND SECTORAL REALLOCATION

A process of structural transformation that renders sustained long-term productivity growth and job creation is characterized by: (1) declining employment (or hours worked) and nominal value-added shares in agriculture, (2) rising employment (or hours worked) and nominal value-added share in services, and (3) having a hump-shaped evolution of employment (or hours worked) and nominal value-added shares in manufacturing (Duarte and Restuccia 2010, 2018; Herrendorf, Rogerson, and Valentinyi 2014). Sectoral employment and value-added shares in agriculture, manufacturing, and market services for 103 countries over 1995–2015 corroborate stylized facts (1) to (3).

Along their respective development paths, advanced countries and some emerging market economies have diversified away from agriculture (including other traditional sectors, like mining) to modern economic activities. The shift of labor from agriculture to modern economic activities has come along with robust productivity growth and an expansion of incomes. It is a shift toward activities that have greater value addition and exhibit a lower extent of volatility (that is, activities that are less vulnerable to commodity prices and weather conditions, among others). In Sub-Saharan Africa, there has been a substantial lag in the process (figure 3.2). Although agricultural employment shares have been declining over time, some countries still have very large shares of agricultural employment compared with advanced countries. African labor released by agriculture is mostly absorbed by services (World Bank 2020a).

Simulations of standard models of structural transformation reveal large potential gains from labor reallocation. These simulations show that higher agricultural productivity growth in Botswana, Ethiopia, Ghana, Kenya, and Senegal (to a level that matches that of South Africa) would translate into a larger employment reallocation out of agriculture and toward the service sector—and, to a lesser extent, manufacturing. The labor reallocation resulting from this counterfactual would increase aggregate labor productivity growth substantially, that is, between 1.2 and 1.6 percent per year (Duarte and Restuccia 2018). Some have argued that countries in Sub-Saharan Africa have experienced premature deindustrialization. The narrative of industrialization in Africa is one of heterogeneous experiences across the continent, rather than premature industrialization. Manufacturing value added is rising in non-oil-abundant countries, while resource-abundant countries face challenges to deepen their industrialization process (Nguimkeu and Zeufack 2019).
There is substantial lag in the structural transformation process of Sub-Saharan Africa.
Manufacturing Jobs Growth: Increased Productivity Needed as Wages Rise

Sustained and large increases in the manufacturing workforce were experienced in several Sub-Saharan African countries over the past 20 years. This increased employment has been attributed to startups and young firms—for example, Côte d’Ivoire and Ethiopia during 1996–2016 (figure 3.3). Most of the 128,000 manufacturing jobs created in Ethiopia were concentrated in startups and young firms. The increased employment was fueled by ample labor supply at relatively low wages. Job creation came along with rising profits per worker for these firms. Their higher profits were associated with increased average labor productivity amid relatively low wages.\(^{15}\) However, there has been a sharp decline in profit margin per worker across all firms since 2014. Gradual wage increases and increasingly capital-intensive production in startups and young firms over time may lead to fewer new jobs per unit of capital in those firms. In Côte d’Ivoire, manufacturing firms continue hiring at lower wage rates. Such job creation may become unsustainable if productivity growth is absent. Firms’ responsiveness to local economic conditions also drove the higher growth creation by startups and young firms, especially those with greater access to external finance (Adelino, Ma, and Robinson 2017). In this context, policies fostering manufacturing growth should reduce entry barriers, boost within-firm productivity, and avoid size-based support schemes (World Bank Group 2020g).

As the period of cheap manufacturing labor comes to an end, wage increases in the region would be supported by higher productivity. Manufacturing job growth along with increased productivity can be attained by lifting market distortions that lead to resource misallocation. The evidence shows pervasive misallocation of resources across and within sectors and industries in developing countries—and, notably, Sub-Saharan African economies.\(^{16}\) For instance, misallocation of labor (toward low-productivity activities) has reduced output per worker growth by 1.3 percentage points per year (McMillan, Rodrik, and Verduzco-Gallo 2014).\(^{17}\) Hence,\(^{18}\)

\(^{15}\) In Ethiopia, the average wage rate paid by other firms was considerably higher than the one in startups and younger firms throughout the period.

\(^{16}\) See World Bank (2020a) and references therein.

\(^{17}\) A similar pattern of labor reallocation has been observed in selected West African countries (Haile 2018).
reallocating resources from low- to high-productivity activities/firms enhances productivity and creates employment opportunities.

The contribution of market share reallocations to productivity in Côte d’Ivoire and Ethiopia is as significant as that in Bangladesh, although at different rates. Manufacturing productivity in Ethiopia grew by 47 percent between 1996 and 2009, while it increased by 6 percent in Côte d’Ivoire over a similar time span (from 2004 to 2016). The pattern of productivity growth of Ethiopian manufacturing is comparable to that of Bangladesh during its early years of industrialization when productivity surged 33 percent over 1995–2001 (Jones et al. 2019). Factor reallocation from less to more productive firms explains a large share of the observed manufacturing productivity growth in Côte d’Ivoire and Ethiopia. Such reallocation occurred not only through the expansion and contraction of existing establishments, but also through the entry of new firms and exit of low-productivity ones. Factor reallocation in Ethiopia enhanced productivity through the exit of the least productive firms that were exposed to greater competition from new and (more productive) incumbent firms. In Côte d’Ivoire, manufacturing productivity growth due to reallocation was attributed to the higher productivity of new firms—compared with that of incumbent establishments (Jones et al. 2019).

Manufacturing job growth can be bolstered not only through resource reallocation, but also by enhancing within-firm technical efficiency. Drivers of within-firm productivity growth include participation in international trade, FDI, and agglomeration economies (Combes and Gobillon 2015). International trade exposes firms to innovation, while FDI relaxes financing constraints and encourages innovation. Innovation capabilities are fostered by economic clusters as they share infrastructure, learn from knowledge and skill exchange and transfers, and provide better matching between producers and intermediate goods (World Bank 2020g). The evidence shows that increased trade exposure boosts plant-level total factor productivity (TFP) in Côte d’Ivoire, Ethiopia, and Tanzania (Jones et al. 2019), as well as the selection of more productive manufacturing firms into exporting in Ethiopia (Bigsten and Gebreeyesus 2009).

Manufacturing Job Growth through Participation in GVCs and Industrial Upgrading

Rising participation in GVCs can promote job creation through the allocation of resources to more productive activities or the generation of backward and forward linkages in and around GVCs. For instance, Lesotho’s integration into the apparel GVC has employed 10 percent of the country’s labor force. Participation in GVCs can lead not only to more but also better jobs, as firms engaging in value chains pay higher wages and provide better working conditions—due to compliance with global standards on health, safety, and the treatment of workers. The insertion of the Ugandan floriculture sector into a GVC led to better working conditions, as reflected by improved health care and sanitation facilities as well as childcare standards. Higher productivity and wages in GVC-participating firms is also attained through access to training and skills development. For instance, employer-sponsored training is the most common source to improve skill and career development (World Bank 2017b).

18 The relative contribution of the reallocation effect vis-à-vis the within-firm effect in Côte d’Ivoire is sensitive to more recent periods—for example, the 2011–17 period.
19 The hyper-specialization of the production process enables exporting firms to focus on a few tasks, rather than mastering the entire production process. Therefore, firms in developing countries that participate in GVCs are typically more productive, and all the types of GVC participation are associated with higher output and productivity growth than standard trade (World Bank 2020b).
Few countries in the region participate effectively in GVCs. For instance, Lesotho, Eswatini, Tanzania, and Mauritius had the largest foreign value-added shares in the region in 2015, due to the relatively large share of their imports for exporting textiles and apparel products. More recently, East African economies have increased their GVC participation in agribusiness and apparel (Ethiopia and Kenya), manufacturing exports (Tanzania), and, to a lesser degree, transport and tourism (World Bank 2020o). A greater share of the exports of Guinea, Nigeria, the Republic of Congo, the Democratic Republic of Congo, and Angola (mainly crude petroleum, mineral ores, and metals, as well as other raw materials) is inputs for other countries’ manufacturing exports. In this context, Sub-Saharan African countries should pursue policies that foster backward linkages among firms in the region and enhance the transfer of knowledge and technology through imported intermediates.

Upgrading in manufacturing GVCs (switching to higher value activities) is also an important source of job creation and sustained productivity growth. In Sub-Saharan Africa, manufacturing jobs have increased in GVC-participating firms due to the expanding demand for manufactured goods in the global economy. Increased global demand, for instance, added 1.7 percentage points to manufacturing GVC job growth in Ethiopia. It also added GVC jobs in Kenya, Senegal, and South Africa between 2000 and 2014, by 0.9, 0.6, and 0.5 percentage points, respectively. Despite this job growth, the share of formal manufacturing jobs in total GVC jobs is the lowest in Sub-Saharan Africa. This share can be lower than 10 percent (Ethiopia and Senegal) and as high as 20 percent (South Africa) for countries in the region. It is greater in benchmark countries, exceeding 35 percent in Bangladesh, Brazil, China, India, and Malaysia (figure 3.4).

The share of formal manufacturing jobs in total GVC jobs is still low in Sub-Saharan Africa.

**FIGURE 3.4: Sectoral Employment in GVCs, Sub-Saharan Africa and Benchmark Countries (% of total)**


Note: The shares of GVC employment correspond to the year 2014. Countries are ranked by share of manufacturing.

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20 The evolution of the participation of Sub-Saharan African countries in GVCs is described in Coulibaly, Kassa, and Zeufack (2020).

21 Specialization in core tasks; access to imported inputs, knowledge, and technical spillovers from multinational enterprises; and exposure to global competition can enhance the productivity growth of firms joining manufacturing GVCs (Criscuolo and Timmins 2017).
The shares of agriculture and service sector jobs in total GVC jobs is higher in Sub-Saharan Africa. In 2014, the participation of agriculture in GVCs rendered an additional 2.4 million jobs in Ethiopia, 1.2 million in Kenya, 171,000 in Senegal, and 781,000 in South Africa. At the same time, the South African service sector added 1.3 million jobs through integration into GVCs, 586,000 in Ethiopia, 395,000 in Kenya, and 55,000 in Senegal. The trends in some comparator countries are different. For example, jobs created in agriculture through GVCs declined in China, while they sharply increased in manufacturing, between 2000 and 2014. In Bangladesh and India, job creation in GVCs increased in all sectors but was steeper in manufacturing.\(^\text{22}\)

Job growth can be affected by changes in the labor requirements needed per unit of output, competitiveness, and the demand for the product (figure 3.5). Declining competitiveness and lower labor requirements needed per unit of output (through the adoption of labor-saving technologies that replace routine production tasks along GVCs) weakened the growth of employment through GVC participation in Sub-Saharan Africa and some comparator countries (Reinjnders and de Vries 2018). The deterioration of competitiveness reduced job growth along GVCs in South Africa by 0.35 percentage point, as well as in Ethiopia (0.78 percentage point), Kenya (0.1 percentage point), and Senegal (0.22 percentage point). Job growth in Brazil and Malaysia hardly increased through the competitiveness channels, although this was not the case of Vietnam, Bangladesh, China, and Indonesia. Finally, technological improvements have reduced labor requirements in countries with an advanced manufacturing sector around 2000. That is, further increases in productivity were minimal compared with improvements in non-agriculture sectors with backward linkages to manufacturing. Labor requirements in manufacturing increased job growth by 0.34 percentage point in Ethiopia.

\[\text{FIGURE 3.5: GVC Participation and Job Growth: The Roles of Technology, Competitiveness, and Demand in Sub-Saharan Africa and Benchmark Countries, 2000–14}\]

<table>
<thead>
<tr>
<th>Country</th>
<th>Technology</th>
<th>Competitiveness</th>
<th>Demand</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vietnam</td>
<td>-0.60</td>
<td>1.69</td>
<td>0.55</td>
</tr>
<tr>
<td>Ethiopia</td>
<td>-0.78</td>
<td>1.69</td>
<td>0.34</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>-0.27</td>
<td>0.70</td>
<td>0.53</td>
</tr>
<tr>
<td>India</td>
<td>-0.41</td>
<td>0.01</td>
<td>1.01</td>
</tr>
<tr>
<td>China</td>
<td>-1.23</td>
<td>0.50</td>
<td>1.09</td>
</tr>
<tr>
<td>Kenya</td>
<td>-0.44</td>
<td>0.10</td>
<td>0.89</td>
</tr>
<tr>
<td>Indonesia</td>
<td>-0.54</td>
<td>0.19</td>
<td>0.65</td>
</tr>
<tr>
<td>Brazil</td>
<td>-0.48</td>
<td>0.14</td>
<td>0.78</td>
</tr>
<tr>
<td>Senegal</td>
<td>-0.25</td>
<td>0.22</td>
<td>0.63</td>
</tr>
<tr>
<td>Malaysia</td>
<td>-0.25</td>
<td>0.11</td>
<td>0.47</td>
</tr>
<tr>
<td>South Africa</td>
<td>-0.35</td>
<td>-0.35</td>
<td>0.46</td>
</tr>
</tbody>
</table>


Note: Countries are ranked by total growth in the number of jobs.

\(^{22}\) Distinguishing services and manufacturing activities is becoming more difficult, as some GVC jobs in services include tasks that support manufacturing, such as transport and communications, finance, business processing, and after-sales services (Pahl et al. 2019).
Although upgrading has occurred in manufacturing activities that are relatively less intensive in knowledge, there is some degree of variation across countries. In some countries, industrial upgrading has taken place in high and low knowledge-intensive activities—for example, Cameroon and Senegal added jobs in less knowledge-intensive industries (food and beverages, textiles and apparel, wood and paper, and metal products industries) and high knowledge-intensive ones (electrical and machinery as well as transport equipment). The transport equipment industry in Ethiopia and South Africa and the electrical and machinery industry in Kenya also experienced an increase in employment (table 3.1). Raising value-added growth in these industries is related to high employment growth effects (World Bank 2020g).

Upgrading along GVCs creates jobs in the manufacturing sector, although with bias toward more skilled manufacturing and functional business-related jobs, as is the case of high-income countries with high initial capabilities. It is not only vital to upgrade in GVCs to create more jobs, but also important to create job opportunities for Africa’s large unskilled workforce. Greater specialization in low-skill activities in the value chain is therefore needed. Inclusive growth is achieved when the sectors/industries participating in GVCs with better economic performance are labor-intensive and use relatively lower-skilled labor (Allard et al. 2016). The volume of activity performed in GVCs is as important as specializing in sophisticated activities in the value chain as important benefits can be obtained from specializing in less sophisticated manufacturing activities and performing them on a large scale (Kowalski et al. 2015).

The growth of employment shares in less knowledge-intensive activities has been striking. Food and beverages registered the largest growth in employment shares in Côte d’Ivoire (6.5 percent), Ghana (19.9), and Malawi (21.1). Employment shares in textiles and apparel recorded growth rates of 14 and 6.1 percent in Cameroon and Kenya, respectively. Metal products is the only less

<p>| Table 3.1: Employment Growth in Manufacturing Industries in Sub-Saharan Africa and Benchmark Countries (%) |
|-------------------------------------------------|-------------------------------------------------|-------------------------------------------------|-------------------------------------------------|-------------------------------------------------|-------------------------------------------------|-------------------------------------------------|-------------------------------------------------|-------------------------------------------------|</p>
<table>
<thead>
<tr>
<th>Country</th>
<th>Period</th>
<th>Food and beverages</th>
<th>Textiles and apparel</th>
<th>Wood and paper</th>
<th>Chemical and non-metal products</th>
<th>Metal products</th>
<th>Electricity and machinery</th>
<th>Transport and equipment</th>
<th>Total manufacturing</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sub-Saharan Africa</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Côte d’Ivoire</td>
<td>1994-1997</td>
<td>11.5</td>
<td>9.1</td>
<td>4.3</td>
<td>4.8</td>
<td>5</td>
<td>2.8</td>
<td>-2</td>
<td>35.6</td>
</tr>
<tr>
<td>Cameroon</td>
<td>1998-2008</td>
<td>2.4</td>
<td>6.8</td>
<td>2.5</td>
<td>-4.2</td>
<td>6</td>
<td>7.1</td>
<td>5.6</td>
<td>26.3</td>
</tr>
<tr>
<td>Ethiopia</td>
<td>1998-2015</td>
<td>14.1</td>
<td>11.7</td>
<td>15.9</td>
<td>25.6</td>
<td>23.7</td>
<td>5.5</td>
<td>23.8</td>
<td>120.2</td>
</tr>
<tr>
<td>Ghana</td>
<td>1995-2003</td>
<td>60</td>
<td>-4.6</td>
<td>5.5</td>
<td>19.9</td>
<td>0.3</td>
<td>-10.1</td>
<td>-30.1</td>
<td>40.9</td>
</tr>
<tr>
<td>Kenya</td>
<td>1998-2015</td>
<td>15.2</td>
<td>18.7</td>
<td>7.2</td>
<td>11.1</td>
<td>14.1</td>
<td>11.6</td>
<td>-18.4</td>
<td>59.5</td>
</tr>
<tr>
<td>Malawi</td>
<td>1998-2012</td>
<td>-4.8</td>
<td>6.5</td>
<td>5.5</td>
<td>-1.3</td>
<td>2</td>
<td>na</td>
<td>na</td>
<td>7.9</td>
</tr>
<tr>
<td>Senegal</td>
<td>1998-2014</td>
<td>5.7</td>
<td>4.7</td>
<td>6.3</td>
<td>6.1</td>
<td>-5.4</td>
<td>7.8</td>
<td>8.1</td>
<td>33.2</td>
</tr>
<tr>
<td>South Africa</td>
<td>1998-2015</td>
<td>1.6</td>
<td>-11.7</td>
<td>-2.2</td>
<td>-2.2</td>
<td>1.5</td>
<td>-1.7</td>
<td>2.6</td>
<td>-15.9</td>
</tr>
<tr>
<td><strong>Asian Benchmarks</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bangladesh</td>
<td>1998-2011</td>
<td>10.7</td>
<td>10.8</td>
<td>7.1</td>
<td>20.1</td>
<td>18.8</td>
<td>8.5</td>
<td>4.9</td>
<td>81.0</td>
</tr>
<tr>
<td>Indonesia</td>
<td>1998-2015</td>
<td>4.6</td>
<td>2.3</td>
<td>-1.4</td>
<td>2.9</td>
<td>3.5</td>
<td>3.8</td>
<td>8.8</td>
<td>24.5</td>
</tr>
<tr>
<td>Vietnam</td>
<td>1998-2015</td>
<td>19</td>
<td>20.7</td>
<td>22.2</td>
<td>19.3</td>
<td>22.1</td>
<td>23.9</td>
<td>21.7</td>
<td>149</td>
</tr>
</tbody>
</table>

Sources: World Bank Staff calculations, using data from UNIDO’s INDSTAT2 and UNCTAD Eora database (World Bank 2020g).

Note: Employment growth for each industry is calculated by dividing employment growth of individual industries by the sum of employment growth of all industries multiplied by employment growth in the total manufacturing sector of respective countries. n.a. = not available.
knowledge-intensive upgrading sector that recorded growth of employment share in Ethiopia. Wage growth in less knowledge-intensive activities has been noteworthy too. In Malawi, food and beverages employs two-thirds of the manufacturing workers, and the industry’s wage rate grew by 50.1 percent between 1998 and 2012. The wage rate in food and beverages grew by 60.2 percent in Ethiopia (1998–2015), while the wage rate increased by 80.5 percent in metal products in Senegal (1998–2014) and 81.8 percent in wood and paper in Malawi. The wage rate increases suggest greater welfare for workers in GVC-participating firms (World Bank 2020g).

Creating jobs through GVC participation requires policies to boost competitiveness. The AfCFTA provides an institutional mechanism to lower production costs by addressing tariffs, NTBs, and trade facilitation problems and channel investment to overcome existing bottlenecks. The full implementation of the AfCFTA can also stimulate the development of regional value chains. Nearly half of the intra-Regional Economic Community exports in Africa are manufactured goods. Organizing production across the region and expanding regional trade can help diversify and foster the industrialization of African economies as well as build resilience (UNECA 2020). Box 3.1 argues for (re)positioning African countries to seize the opportunities arising from building more resilient GVCs in the aftermath of the COVID-19 pandemic.

Central Role of Services in Manufacturing and GVCs: The Need for Reform in the Region

With the rise in fragmentation of production processes and multiple production value chains, the importance of services such as coordination, transportation, logistics, finance, communications, and other business services is becoming even more critical. Services play a central role in the patterns of international trade and investment: they enable the development of value chains and create value chains in their own right.²³ There is evidence within and across borders of strong productivity linkages between the organization of production within firms and the organization, efficiency, and quality of producer services. Service sector productivity is positively associated with manufacturing output and productivity. Manufacturing firms use services as inputs, and services productivity influences the export of goods, which is known to depend on firm-level manufacturing productivity.²⁴ Hence, to succeed in GVCs, African countries need to reform the service sector to improve access, reduce cost, and improve quality.

As inputs in the production of manufactured goods, services development can help increase output and productivity. Specifically, the intensive use of financial and business services can boost manufacturing firms’ productivity, lower the cost of doing business, and foster product differentiation, among other things.²⁵ Manufacturing firms that intensively use financial and business services benefit the most from domestic services development (Liu et al. 2018).²⁶ Furthermore, imported services inputs can also boost the productivity of manufacturing firms in countries with an underdeveloped service sector. Industrialization in Africa needs to focus not only on manufacturing production, but also on having a development strategy for the service sector. African policy makers should account for the manufacturing-services linkages in trade negotiations.

²³ Draper et al. (2012); Heuser and Mattoo (2017).
²⁴ Hoekman and Shepherd (2017).
²⁵ Financial sectors can mobilize resources efficiently, stimulate investment, and help firms (and households) diversify risks. The business services sector comprises a wide array of activities, ranging from software consulting and data processing to management consultancy, engineering, and research and development services.
²⁶ Reforms that promote competition in banking, transport, insurance, and telecommunications raised the productivity of foreign and locally owned manufacturing firms in India. A one standard deviation increase in the aggregated index of services liberalization led to increases in productivity of 11.7 percent for domestic firms and 13.2 percent for foreign enterprises. The largest additional effect was for transport reforms, followed by telecommunications and banking reforms (Arnold et al. 2016).
The combination of trade policy shocks and enduring public health concerns from COVID-19 has created uncertainty about the future of international trade, resulting in a rethinking of global value chains (GVCs) in manufacturing. Existing production networks are designed for efficiency and cost advantages. Due to COVID-19 and emerging geopolitical trends in advanced economies, there is a growing preference for resilience or “de-risking” strategies. This could lead to geographic switching of GVCs, reducing the high reliance on Factory China and promoting vertical integration. COVID-19 is expected to reinforce an already ongoing change in GVCs with respect to geographic rebalancing. Between 16 and 26 percent of global exports are expected to move to different countries in the next five years. The change in heavily traded labor-intensive manufacturing GVCs, a sector in which many African countries have comparative advantages, is expected to be significant. For example, the share of trade produced by the top three exporting countries in apparel dropped significantly from 2015 to 2018. Textile and apparel GVCs are expected to feature the highest share of trade shifting to other countries. For African countries with relatively higher backward linkages in manufacturing GVCs, this suggests the need to (re)position themselves to reap any gains arising from fundamental changes in GVCs due to a relative increase in preference for GVC resilience or an associated rise in vertical integration.

Evidence from the Great East Japan earthquake of 2011 suggests that more diversified supply chain networks lead to firms’ resilience to natural disasters. Following the earthquake, imports shifted away from the affected input source toward developing countries that had a revealed comparative advantage in the input. The current crisis has revealed the extent of dependence on Factory China and the risks of concentration of GVCs. A more resilient strategy to reduce the risk of potential supply chain disruption would be for firms to reduce dependence on any one individual supplier. The shift in GVCs is expected to create opportunities for developing economies. For example, Vietnam and Bangladesh have been and will continue to be the main beneficiaries of this shift. With the right policy mix and active industrial policies, African countries could present a viable alternative to attract some of these investments, based on their comparative advantages.

A robust set of active policy reforms to improve the business climate; improve contract enforcement mechanisms; maintain flexibility in promoting and attracting foreign direct investment (FDI); and strengthen complementary services such as finance, transport, and communications; and trade facilitation could contribute to attracting such investment to the region. A recent survey tracking U.S. sourcing executives’ plans for textile and apparel manufacturing suggests that the major drivers of sourcing include the following: (i) speed to markets; (ii) production and sourcing cost, including labor cost and access to cheaper yarns and fabric produced locally; (iii) flexibility and agility in rapidly adjusting the delivery, volume, and products based on requests; and (iv) risks of factory, social, and environmental compliance. Policy reforms that address these key challenges could better position African countries as attractive destinations for firms seeking to relocate manufacturing in response to the crisis.

Investment promotion efforts aimed at reducing the costs of FDI; easing restrictions on the costs of trade, including transport and logistics; and alleviating information asymmetries and burdensome bureaucratic procedures can remedy the scarcity of capital, technology, and management skills. This requires a mix of industrial policies and targeted investment promotion activities. Targeting selected industries with comparative advantage is considered best practice, as more intense pursuit of priority industries is found to lead to greater FDI inflows than less intense across-the-board efforts to attract FDI.

*a* These include rising protectionism in advanced economies, China-U.S. trade tensions, and Brexit.

*b* Javorcik (2020a); Baldwin and Tomiura (2020); Gruszczynski (2020).


*d* McKinsey Global Institute (2020) estimates that relative to all other value chains, textiles and apparel feature the highest percentage of trade that could most likely shift (36 to 57 percent in apparel and 23 to 45 percent in textiles). This represents a range of $67 billion to $393 billion in value.

*e* Freund et al. (2020).

*f* Lu (2019).

*g* Javorcik (2020b).

Opening markets to certain types of services is critical for countries that join/participate in GVCs. This is the case of, for example, logistics providers and express delivery services—especially because the innovation in value chains mostly occurs among retailers (at the downstream end). Large retailers and e-commerce enterprises, as opposed to small retailers, can seize the opportunities created by new supply chain technologies to enhance GVC productivity (Ferrantino and Koten 2019). The development of GVCs can be fostered by policies that enhance the enabling environment for e-commerce and facilitate free movement of data. Fostering competition in telecommunications services and removing barriers to the adoption of the internet are critical to ease the flow of information between buyers and sellers that is required to promote GVCs.

Several restrictions on entry, ownership, and operations characterize services markets across the world. In Sub-Saharan Africa, the extent of trade services restrictiveness is often higher, although there are significant variations. Countries like Ethiopia, Zimbabwe, and the Democratic Republic of Congo have very restrictive services trade policies, while others like Rwanda, Madagascar, and Senegal are considered open (Borchert, Gootiiz, and Mattoo 2014). The central role of services in manufacturing and GVCs suggests the need for reform in the region. Services reform could lead to improved quality and access to existing services and availability of new and improved services due to the entry of new and more advanced service providers (Arnold et al. 2016). The reliability of existing services could also be improved following reforms that encourage competition and efficiency in the sector. In addition, reducing market power in services may enhance competition and innovation in the sector, reduce barriers to entry, and lead to reduced prices of services, especially if dominant firms in the market have been appropriating much of the innovation rent prior to reform.

Finally, tourism services in Africa can benefit from joining tourism GVCs and consolidating their position as an international tourist destination. Yet, upgrading in the sector along several dimensions is needed to generate sustained growth and create jobs (Daly and Gereffi 2018): product upgrading (e.g. improving leisure products that appeal to local/regional customers), process upgrading (say, forging relationships between domestic distribution intermediaries and global tour operators to access customers), functional upgrading (for example, hotels and lodges adding restaurants), chain upgrading (conference tourism), and end-market upgrading (such as increasing tourism from Asia). Box 3.2 summarizes some of the COVID-19 policy responses in the tourism sector.
Tourism is one of the sectors that has been severely affected by the COVID-19 pandemic throughout the world and, particularly, in Sub-Saharan Africa. Lockdown measures resulting from the pandemic led to a 56 percent year-on-year drop in tourist arrivals worldwide in the first five months of 2020—an equivalent to a fall of 300 million tourist and US$320 billion lost in tourism receipts (UNWTO 2020). The tourism and travel sector in Africa could lose at least US$50 billion in revenues and two million direct and indirect jobs due to COVID-19 (African Union 2020). Tourism-dependent countries are the ones that have been hit the hardest. For instance, tourism revenues in Mauritius for July fell 92 percent year-on-year, to MUR 414 million as borders remained closed. Uganda could lose as much as US$2 billion in tourism revenues due to the travel restrictions. A series of fiscal and monetary measures have been deployed to support the tourism sector, including emergency measures, job protection, and skill development measures to restart tourism and promote domestic tourism. Table B3.2.1 presents a summary of these measures.

**Table B3.2.1: Policy Measures to Support Tourism**

<table>
<thead>
<tr>
<th>Emergency measures</th>
<th>Job protection and skill development</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Temporary exemption/deferral/reduction of tourism-related taxes for businesses</td>
<td>• Reduction of the training levy for tourism operators</td>
</tr>
<tr>
<td>in the travel and hospitality industry</td>
<td>• Wage subsidies to retain jobs in tourism, hospitality, and aviation</td>
</tr>
<tr>
<td>• Economic support for SMEs in tourism</td>
<td>• Financial support for trainees</td>
</tr>
<tr>
<td>• Discount on utility expenses for businesses</td>
<td>• Support businesses with digital skills training</td>
</tr>
<tr>
<td>• Cash flow assistance to travel agencies</td>
<td>• Retraining and reskilling tourism workers, including the unemployed</td>
</tr>
<tr>
<td>• Financial funds for tourism SMEs (loan schemes and preferential conditions for</td>
<td>• Capacity-building programs</td>
</tr>
<tr>
<td>loans)</td>
<td></td>
</tr>
<tr>
<td>• Incentive program to airlines</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Restarting tourism</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Vouchers for trips/travel packages canceled due to COVID-19</td>
</tr>
<tr>
<td>• Contract law amendments to protect customers and operators</td>
</tr>
<tr>
<td>• Guidelines/recommendations on concluded tourist package contracts with</td>
</tr>
<tr>
<td>implementation problems due to COVID-19</td>
</tr>
<tr>
<td>• Health and safety protocols, certifications, and labels in tourism establishments</td>
</tr>
<tr>
<td>(accommodations sector, restaurants, and spas and wellness centers)</td>
</tr>
<tr>
<td>• Creation of safety corridors between countries to restart international tourism</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Promoting domestic tourism</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Holiday vouchers for domestic travel</td>
</tr>
<tr>
<td>• Domestic tourism promotion and marketing campaigns</td>
</tr>
<tr>
<td>• Fee waivers on air service charges on domestic airline operations and domestic</td>
</tr>
<tr>
<td>and regional aviation security charges</td>
</tr>
<tr>
<td>• Co-financing smaller promotional projects and executing projects on the domestic</td>
</tr>
<tr>
<td>market</td>
</tr>
<tr>
<td>• Product development initiatives</td>
</tr>
</tbody>
</table>

Sources: UNWTO 2020a.
Note: SMEs = small and medium-size enterprises.
African Continental Free Trade Area: How to Reap the Productivity and Job Gains?

The agreement establishing the AfCFTA entered into force in May 2019 for the 24 countries that had deposited their instruments of ratification by then.27 Trade under the AfCFTA agreement was due to start on July 1, 2020, although this date has been postponed due to the COVID-19 pandemic. Once completed, the AfCFTA will be the largest free trade area in the world in terms of membership. It will potentially cover a market of 1.3 billion people (60 percent of whom are age 25 years or younger) and a GDP of US$3.4 trillion. The success of this treaty depends on the depth and breadth of the detailed commitments to remove trade barriers and their implementation. So far, the treaty contains the legal framework for trade in goods and trade in services, the institutional setup, and state-to-state dispute settlement provisions. The specific terms of trade liberalization in goods and services are still being negotiated. Additional protocols on investment, competition policy, and intellectual property rights are expected to be negotiated in the second phase of the agreement. Seizing the opportunities created by the AfCFTA will require addressing the weaknesses that have limited the impact of previous regional trade agreements in Africa. It will also entail work with stakeholders at the regional and domestic levels, including the Permanent Secretariat, the Regional Economic Communities, national governments, the private sector, and civil society.

27 To date, 30 countries have deposited their instruments of AfCFTA ratification with the African Union Commission chairperson.
Potential Benefits of the AfCFTA Are Substantial

The AfCFTA aims to reduce tariffs among member countries and cover policy areas such as trade facilitation and services, as well as regulatory measures—for example, sanitary standards and technical barriers to trade. Consequently, this agreement is large in scope. It will complement existing sub-Regional Economic Community agreements in Africa by offering a continentwide regulatory framework and regulating policy areas—such as investment and intellectual property rights protection—especially those that have not been covered in most subregional African agreements. The long-term economic and distributional implications of the AfCFTA have been estimated recently, and they assume changes in trade policy that are in line with ongoing negotiations in three main categories (World Bank 2020b).

First, tariffs on intracontinental trade are progressively reduced in line with AfCFTA modalities. Starting in 2020, tariffs on 90 percent of tariff lines will be eliminated over a five-year period (10 years for the least developed countries, or LDCs). Starting in 2025, tariffs on an additional 7 percent of tariff lines will be eliminated over a five-year period (eight years for LDCs). Up to 3 percent of tariff lines that account for no more than 10 percent of intra-African imports can be excluded from liberalization by the end of 2030 (2033 for LDCs).

Second, non-tariff barriers on goods and services are reduced on a most favored nation basis. It is assumed that 50 percent of the NTBs can be addressed with policy changes in the context of the AfCFTA, with a cap of 50 percentage points. It is also assumed that there will be additional reductions in NTBs on exports.

Third, the AfCFTA will be accompanied by trade facilitation measures, with commitments closely aligned with the Trade Facilitation Agreement (TFA). Upper bound gains from trade facilitation assume that all countries will implement the TFA fully as part of the AfCFTA process. Estimates show that higher scores of the trade facilitation indicator reduce the probability of a longer time in customs. The estimates of trade cost reductions due to trade facilitation measures range between 2 and 10 percent over 2020–35.

This section illustrates the impacts of the (partial to full) implementation of the AfCFTA on African economies. The full AfCFTA scenario involves tariff reduction, elimination of NTBs, and implementation of the trade facilitation measures. A global computable general equilibrium model with a microsimulation framework is used to evaluate the agreement’s impact on: (1) welfare (as measured by real income gains), (2) trade performance, (3) sectoral output and productivity, (4) labor markets, and (5) poverty.

Welfare effects. The continentwide welfare gains from AfCFTA, as measured by changes in real income (equivalent variation), tend to grow as all aspects of the treaty are fully implemented. For instance, real income (equivalent variation) gains from implementing only the tariff liberalization
phase are small (at 0.22 percent).\textsuperscript{31} Removing only one constraint is not sufficient for real income gains to materialize. The gains from tariff liberalization and NTB reductions (with increased access to non-African markets) amount to 2.4 percent for the continent in 2035. Under full implementation of the AfCFTA agreement, the continent’s welfare increases by an additional 4.6 percentage points—thus implying substantial gains from trade facilitation.\textsuperscript{32} The gains from regional integration resulting from full implementation of the AfCFTA go beyond the traditional welfare analysis. There are significant dynamic gains from trade associated with exploiting economies of scale in larger markets, attracting substantial FDI inflows, increased competition, transfer of technology and managerial know-how, and economic diversification. However, the framework applied in this section does not capture some of these dynamic gains from trade.

Welfare gains are unevenly distributed across countries in the region. At the very high end, Côte d’Ivoire and Zimbabwe have gains of 14 percent, followed by Kenya, Namibia, and Tanzania, with gains that exceed 10 percent. At the lower end, a few countries have gains of 2 percent, including Madagascar, Malawi, and Mozambique (figure 3.6). The computed income gains tend to be higher in countries attaining greater access to other markets—as heavily protected countries might experience larger output reallocation across sectors due to increased import competition and lower imported input prices. Under the full AfCFTA scenario (which includes changes in tariffs, NTMs, and trade facilitation), real income in Africa would grow by 7 percent in 2035, a sizable gain.\textsuperscript{33} The gain amounts to US$445 billion in 2035 (at 2014 prices and exchange rates).\textsuperscript{34}

\textbf{FIGURE 3.6: Real Income Gains, by Country and Policy Reform}


\textit{Note: Real income is measured by equivalent variation, that is, the expenditure to attain utility in year t in any given simulation using base year prices. EV = equivalent variation; NTMs = non-tariff measures; TF = trade facilitation.}

\textsuperscript{31} The relatively smaller gains from tariff liberalization can be attributed to the high NTMs and trade facilitation bottlenecks constraining trade in Africa. Still, some countries are bound to welfare gains that exceed 1 percent due to substantial market access improvements in other AfCFTA markets (Namibia, Morocco, and Senegal).

\textsuperscript{32} The TFA simulations do not include specific measures to improve trade facilitation. Some measures may have relatively low cost, but others may require investments in software, other logistical support, infrastructure, and so forth. These costs could reduce the net gains from improvements in trade facilitation.

\textsuperscript{33} Real income is measured by equivalent variation; that is, the expenditure to attain utility in year t in any given simulation using base year prices. It is similar in magnitude to real private consumption.

\textsuperscript{34} Although the continent registers by far the largest aggregate gains, the rest of the world experiences an increase of US$76 billion by 2035, which translates into a gain of 0.1 percent relative to the baseline scenario.
**Foreign trade.** Trade is expected to increase substantially in Africa. Export volumes grow nearly 29 percent by 2035 (relative to the baseline). Intracontinental export growth exceeds 81 percent, while exports to non-African countries increase by 19 percent. Infra-AfCFTA exports to regional partners will double or triple relative to the baseline in Morocco, the Arab Republic of Egypt, Cameroon, Ghana, and Tunisia. A significantly smaller expansion is expected in Mozambique, the Democratic Republic of Congo, and Zambia (10-30 percent). Under the AfCFTA scenario, total manufacturing exports from Africa register the largest increase (62 percent from the baseline for 2035), while manufacturing exports within the region and to the rest of the world increase by 110 and 46 percent, respectively. Agricultural exports have modest gains (49 and 10 percent for intra- and extra-African exports), and the gains in services trade are even smaller (4 percent overall and 14 percent within the region). Intracontinental trade, in monetary terms, grows from US$294 billion in 2035 under the baseline scenario to US$532 billion after the full AfCFTA implementation. By 2035, the biggest beneficiaries—in terms of the largest increases in the value of exports to regional partners—are, in order of value, Egypt, Morocco, South Africa, Nigeria, Kenya, and Côte d’Ivoire (between US$48 billion and US$11 billion). Analogous to the welfare gains, the smallest export expansions are expected for the economies that are already relatively open, such as Madagascar, Malawi, Mauritius, and Rwanda, with export increases of less than US$1 billion.

**Sectoral output and productivity.** The treaty has the potential to boost regional output and productivity amid a large resource reallocation across sectors and countries. Under the baseline scenario (no AfCFTA), services output would grow to US$8.5 trillion (142 percent growth), manufacturing to US$4.5 trillion (131 percent), and agriculture to US$1.7 trillion (106 percent). The AfCFTA would provide an additional boost in all these sectors except agriculture, where the output expansion would be US$8 billion (0.5 percent) smaller than in the baseline scenario. Nevertheless, agricultural output would grow faster under the AfCFTA in all parts of Africa other than North Africa, where the agreement would spur a faster shift from agriculture toward manufacturing and services (figure 3.7).

The agreement can potentially boost Africa’s output by US$211 billion—with the largest increases in the service sector (US$147 billion), manufacturing (US$56 billion), and natural resources (US$17 billion). Economic gains for the continent as a whole mask a lot of heterogeneity in outcomes across countries. Among the 24 African economies represented in the simulations, the relative importance of agriculture increases in 14 countries, natural resources in 12 countries, manufacturing in six countries, and services in 13 countries. Although the share of manufacturing in output decreases for the majority of countries, the volume of manufacturing output will continue to increase under the AfCFTA. It is higher for 15 of the 24 countries in 2035 (relative to the baseline scenario). Similarly, in the case of agriculture, the volume of output under the AfCFTA by 2035 is higher in 15 of the 24 countries and, in the case of services, the volume is higher in 21 countries, partially reflecting the positive income elasticity of services.

**Labor markets.** The full AfCFTA implementation would create better opportunities for unskilled and female workers. Across sectors, the share of workers in energy-intensive manufacturing, trade services, and public and recreational services would increase. Agricultural employment would increase in 60 percent of the countries, and wages for unskilled labor would grow faster
where there is an expansion in agricultural employment. By 2035, wages for unskilled labor would be 10.3 percent higher than the baseline, while the increase for skilled workers would be 9.8 percent. Wages would increase slightly faster for women than for men, as output expands in key female labor-intensive industries. By 2035, wages would increase 10.5 percent (from the baseline) for women and 9.9 percent for men (figures 3.8 and 3.9).
Labor market outcomes differ across countries: the AfCFTA could widen the skill and gender gaps in a few cases. Governments will need to focus on facilitating a smooth and inclusive transition by supporting flexible labor markets, improving connectivity within countries, and maintaining sound macroeconomic policies and a business-friendly environment for domestic and foreign investors. Policy makers will need to monitor carefully the distributional impact of the AfCFTA across sectors and countries, on skilled and unskilled workers, and on female and male workers. Doing so will enable them to design policies to reduce the costs of job switching and provide effective safety nets where they are needed most.

Poverty effects. The AfCFTA can lift an additional 30 million people from extreme poverty and 68 million people from moderate poverty. Across the continent, the poverty rate varies widely: it is 41.1 percent in Sub-Saharan Africa but less than 3 percent in North Africa. It is 77.7 percent in the Central African Republic but just 0.4 percent in Algeria and Egypt. Under the baseline simulations, the headcount ratio of extreme poverty in Africa is projected to decline to 10.9 percent by 2035, from 34.7 percent in the latest estimate (2015). Full implementation of the AfCFTA would contribute to a further decline by lifting an additional 1.5 percent of the continent’s population from extreme poverty. In West Africa, the poverty headcount would decline by 12 million people, while the declines in Central Africa and East Africa would be 9.3 million and 4.8 million, respectively. At the moderate poverty line of $5.50 a day in purchasing power parity terms, the AfCFTA has the potential to lift 67.9 million people (about 3.6 percent of the continent’s population) out of poverty by 2035 (figures 3.10 and 3.11).

The analysis conducted in World Bank (2020b) may have underestimated the impacts, as the analysis does not capture the following: (1) informal or new trade flows in sectors and countries not trading in the baseline, (2) dynamic gains from trade (for example, economies of scale and learning by doing), and (3) foreign investment. Improving market conditions, competitiveness, and business sentiment will induce FDI into Africa, thus leading to higher investments and accelerating imports of high-technology intermediate and capital goods and improved management practices. Hence, FDI inflows could boost regional income above the gains predicted in this analysis. Yet, the results might overestimate the impacts, as the analysis does not capture the following: (1) the costs of lowering NTBs and trade facilitation measures, or (2) the transitional costs associated with trade-related structural change, such as employment shifts and potentially stranded assets, such as capital.35

**How to Maximize the Potential Benefits of the AfCFTA?**

Maximizing the potential benefits of the AfCFTA requires that the treaty’s institutions and member states effectively implement and administer the stipulated obligations. Consumers, investors, and traders play a critical role in this process by counterbalancing vested interests who may resist these reforms. Free trade in the region goes beyond tariff removal. It involves addressing on-the-ground constraints that may weaken the daily operations of ordinary producers and traders. This calls for regulatory reform, and capacity building among the institutions that enforce these regulations.

Actions at the supranational and national levels should be deployed simultaneously. For instance, the Regional Economic Communities can provide the framework for reform by bringing together regulators to define harmonized standards or agree on mutual recognition of the qualifications of professionals. Still, the responsibility for the agreement’s implementation lies ultimately and unequivocally with each member country. National integration agendas must cover services as well as goods. Services are critical, job-creating inputs into the competitive edge of almost all other activities (for example, the role of transport in manufacturing). Reaping the benefits of the AfCFTA requires an implementation of the agreement that is underpinned by improved trade facilitation and connectivity. The Niamey Declaration contains important provisions about trade facilitation that will need to be implemented.

Trade routes in Africa were designed for exports away from the continent rather than facilitating intra-African trade. Economic centers in many landlocked countries are located several hundreds of kilometers from the closest seaport. Policy makers in all member countries, especially in transit countries, share a critical responsibility to help overcome geographical constraints or the lack of economies of scale due to small transportation volumes. A renewed focus on the efficiency of transport and logistics services is long overdue.

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35 Furthermore, the results are based on a new data set on gender disaggregated employment and wages, which requires further vetting by country experts.
The potential of the AfCFTA to become a milestone for development in the region will depend on: (1) the depth and breadth of the detailed commitments to remove trade barriers that are to be negotiated, (2) the extent to which AfCFTA commitments are effectively implemented on the ground, and (3) specific complementary initiatives ensuring a smooth transition to free trade and inducing greater flows of productive investment in nontraditional sectors, leading to more and better jobs.

Implementing the obligations in the trade agreement will likely prove challenging for many member states. AfCFTA institutions will likely require additional support to implement the agreement effectively, to identify critical bottlenecks and challenges in their economies and prioritize specific actions to ensure a smooth transition to free trade as well as attract more investments. Along with the challenges of monitoring the ongoing implementation, actions are needed to ensure fairness and a level playing field for all traders.

Drawing on the experience of similar negotiations in other developing countries, a complementary agenda to maximize the potential benefits of the AfCFTA would entail the following:

a. Activities related to the implementation and administration of the AfCFTA agreement, including capacity building in the form of training, direct advice, and implementation support for the ministries of trade and border management agencies—especially customs, which will now be tasked with implementing an agreement to which they may not have had any previous exposure during the negotiation phase. This is essential to enable the compliance, administration and problem solving, as well as economic monitoring.

b. Trade-related institutions’ support for implementation, which includes capacity building for agencies other than the ministries of trade (in charge of trade and investment-related matters) that, in practice, affect the correct functioning of the AfCFTA.

c. Transition to free trade, which implies sector-specific initiatives aimed at enabling domestic firms (in particular, SMEs) and addressing economic distortions affecting their competitiveness in a free trade environment.

An effective implementation of the AfCFTA will entail support to several agencies beyond those that are directly responsible for administering the agreement. Several authorities usually regulate and administrate procedures on various matters that directly affect the operation of the norms and disciplines of the trade agreement on the ground. With the support of institutions such as the World Bank Group, countries should deploy a series of analytical tools and specialized expertise to support those agencies whose mandates directly relate to AfCFTA commitments.

Concrete activities under trade-related implementation support will include benchmarking, regulatory gap analyses, economic impact assessments, economic modeling, procedural
streamlining process maps, regulatory transparency assessments, and stakeholder consultations. These activities will provide specific policy and regulatory reform recommendations for fully implementing the AfCFTA agreement in the following areas: (1) market access (tariff liberalization and elimination of NTBs), (2) trade facilitation and border management procedures, (3) sanitary and phytosanitary measures, (4) technical barriers to trade, (5) trade remedies (safeguards, antidumping, and countervailing duties), (6) trade in services, (7) investment, and (8) competition policy.

Facilitating a smooth transition to free trade entails national governments addressing distortions that affect private sector performance. Three activities are proposed to conduct this type of function. The first is identification of specific sectors that are vulnerable during the transition to free trade and estimation of the impact that specific AfCFTA commitments may have on domestic firms and jobs, gender, and other relevant variables. The second is diagnosis of specific economic and regulatory distortions affecting the competitiveness of selected types of firms (such as SMEs in selected sectors) and relying on successful lessons learned from relevant countries in addressing similar challenges. The third is good practices on planning, execution, and follow-up processes for information and consultation between the state and the private sector, to design specific agendas for transition to free trade in the context of the AfCFTA.

In conclusion, the AfCFTA offers ample opportunities for development in Africa; however, its implementation will be a significant challenge. Reducing and removing tariffs will be the easiest part—even if, in some cases, it comes with policy deliberations about the replacement of lost tariff revenues. The hard part will be enacting the non-tariff and trade facilitation measures, which would yield the largest (potential) economic gains. Such measures will require substantial policy reforms at the national level, indicating that there is a long road ahead. Achieving the AfCFTA’s full potential depends on agreeing to ambitious liberalization and implementing it in full. Partial reforms would lead to smaller effects.

36 World Bank (2020b) indicates that tariff revenue losses are likely to be manageable
3.2 TECHNOLOGICAL TRANSFORMATION: A FOCUS ON DIGITAL UPGRADING IN AFRICA

Digital technologies offer opportunities to unlock Sub-Saharan Africa’s potential for rapid economic growth, innovation, job creation, and the steady provision of services. Evidence shows that a 10 percent increase in broadband penetration raises annual per capita growth by 0.9 to 1.5 percent in OECD countries, and increases GDP between 1.5 and 2.5 percent in developing countries (Czernich et al. 2011; ITU 2018, 2019). Yet, access to the internet remains unattainable for most people in Africa. Only 26 percent of the population (about 272 million) have used internet services on a mobile device (as opposed to 56 percent in East Asia), 49 percent of the population (512 million) live within the footprint of a mobile broadband network but have not used mobile internet, and 25 percent of the population (262 million) do not live within the footprint of a mobile broadband network.

Connectivity problems in Sub-Saharan Africa are compounded by the slow speed of the internet in the region and poor consumer readiness (about 55 percent of the population does not own a mobile phone). In April-June 2020, the average download speed for mobile internet was 17.4 megabits per second (Mbps) in Sub-Saharan Africa, compared with 39.7 Mbps in East Asia and the Pacific. The lack of competitive markets and low purchasing power have led to unaffordable internet-enabled devices and data packages for an important part of the population in the region. Noncompetitive market structures may exacerbate the digital divide across income, gender, education, and urban-rural areas. Access to high-speed internet is equally low for African firms, despite the potential of digital technologies to reduce various business and transaction costs.

The COVID-19 pandemic has highlighted the critical importance of digital infrastructure, technologies, and services in enabling government, businesses, and society to continue to function during times of required physical distance and to create more productive, inclusive, and resilient economies. Digital infrastructure and digitally-enabled services and applications have been essential to fight the spread of COVID-19, cope with physical distancing measures, and ensure business continuity of the government and the private sector. Unlike other public health crises, COVID-19 has demanded good quality virtual methods of communication, resilient broadband infrastructure, and greater use of online digital services and products.

Digital technologies for health have played a key role in containing the disease. Digital services and applications are being used in conjunction with data analytics techniques to facilitate decision making on public policy (for example, mobility indicators based on mobile operators’ data have been used in Ghana, Mozambique, and Zimbabwe), to assist health professionals (telemedicine and AI-powered chatbot for triage, such as *Babyl* in Rwanda and *Mobihealth* in Nigeria), and to support broader health systems (for example, tracing, monitoring, procurement, staff deployment, and management of health facilities’ capacity, among others).

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37 This subsection benefits from several background papers of the ongoing joint Office of the Chief Economist in the Africa region-Digital Development Department research program on digital transformation for Africa. More detailed policy recommendations will be forthcoming in the report “Digital Africa: Building the Infrastructure Foundations and Facilitating the Adoption of Technologies for Jobs” in 2021.

38 Digital technologies refer to broadband networks, data center and cloud services, as well as voice networks in certain countries. They also include all software and digital applications that are available on the internet. More broadly, the most sophisticated technologies across many activities include digital elements, such as more intensive use of data increasingly supported by artificial intelligence.

39 The figures reported here correspond to the end of 2019 (GSMA 2020).

40 The minimum high-speed internet in the United States and Europe is 25 Mbps, the appropriate speed for quality videoconferencing or online education or telework.

41 In Senegal, 34 percent of firms use the internet, and 20 percent rely on a digital subscriber line (World Bank 2020p).

42 World Bank (2020f).

43 Kalenzi and Teklemariam (2020).
The availability of digital connectivity and digital services has also eased the mitigation of the economic and social effects of physical distancing measures. Digital services and applications that facilitate remote work for the public and private sectors, along with Edutech solutions, have helped in mitigating the disruption to school and work and ensuring business continuity. Digital services and applications such as mobile payments, food delivery, online shopping, social media, and instant messaging have enabled citizens to remain connected and economically active. For businesses, digital tools to manage supply and logistics chains have proven important in the face of the initial disruptions of GVCs. Box 3.3 summarizes some of the public and private responses in digital infrastructure and services to the COVID-19 pandemic.

However, the use of digital solutions poses a challenge for Sub-Saharan Africa. The region is characterized by a relatively low level of internet penetration (especially in low-income and rural areas and among small businesses), relatively high prices for internet connectivity, and lower quality of service. Reaping the benefits of digital solutions requires reliable connectivity. Otherwise, the region runs the risk of deepening the digital divide. Even governments faced severe broadband connectivity problems, since they did not have systems and equipment to enable remote work at scale. Access to broadband from home by government officials is limited, and digital connectivity of public institutions is almost inexistent, especially in remote areas. In addition to the challenge of availability of digital infrastructure, an important percentage of the population (49 percent) does not use internet services even if there is available coverage. The main barriers to accelerating digital adoption for households and SMEs are purchasing power, affordability linked to high prices of internet services and assets, inadequate internet products, relevant content, lack of awareness and skills to use digital technologies, and even reluctance to use online services due to lack of trust. And there are digital divides in the adoption of technology, where characteristics such as gender, age, education, employment status, and living in a rural area affect the likelihood of internet adoption.

This section documents the evolution of digital infrastructure in the region over the past decade, in terms of the coverage of broadband-capable mobile networks and the factors that constitute a barrier to greater rates of adoption—putting emphasis on affordability problems. It then reviews recent firm-level evidence on the output and employment effects of adopting digital technologies in developing countries. The adoption and use of digital business solutions lead to firms having higher sales and productivity, and can be an entry point to broader, productivity-enhancing upgrading of technologies and capabilities across the economy to create better jobs for more people—one of the three pillars underlying the World Bank Group’s JET agenda. Digital technologies also enhance the welfare of households, thanks to increases in employment and higher earnings, lower consumer prices, and higher agricultural production and productivity. Finally, the section suggests that reaping the benefits of the digital economy requires a flexible regulatory framework and practices that promote competition and innovation among the different actors in the market (including transparency of market information), aims for universal access to high-speed internet, and addresses issues of consumer protection, data governance, and cybersecurity.

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44. Competition in the information, communications, and technology sector can play an important role in lowering prices in the sector and encouraging new market entrants, leading to potential welfare gains, as shown by recent simulation exercises (Rodriguez-Castelán et al. 2020a, 2020b).
45. See Goldfarb and Prince (2008), Birba and Diagne (2012), and Rodríguez-Castelán, Ochoa, et al. (2020b).
46. This section looks at digital transformation from an infrastructure lens. It is an important but not exclusive dimension of the digital transformation with a significant contribution to productivity. An important driver of this transformation in Africa is the surge of digital tech startups over the past decade—especially agri-tech startups (Kim et al. 2020).
Digital Infrastructure: Sub-Saharan Africa Still Lags the Rest of the World

A dynamic, inclusive, and digitally safe economy is built upon five pillars, namely, digital infrastructure, digital skills, digital platforms, digital financial services, and digital entrepreneurship. Digital infrastructure is the first pillar to build a digital economy. It refers to the network services that are required for individuals, businesses, and governments to get online and link with local and global digital services. Digital infrastructure includes connectivity (through high-speed internet and internet exchange points), the internet of things (mobile devices, computers, sensors, voice-activated devices, geospatial instruments, machine-to-machine communications, and vehicle-to-vehicle communications), and data repositories and computational facilities (data centers and clouds).

Trends of selected digital infrastructure indicators in Sub-Saharan Africa are compared with benchmark groups (industrial countries and non-Sub-Saharan African developing countries). Coverage and use of third generation (3G) and fourth generation (4G) networks are more limited in Africa, although they are increasing over time, and fifth generation (5G) network trials have been launched in a few countries. Unlike other regions, second generation (2G) networks are still in use, but there is potential to leapfrog directly to 4G, a technology that can be upgraded later to 5G, to enable high-speed communications that support advanced digital solutions.

The comparison is also made among country groups in Africa, such as East and Southern Africa (ESA), West and Central Africa (WCA), and North Africa. The evolution of digital infrastructure is captured by: (1) 3G network coverage and usage, (2) 4G network coverage and usage, and (3) the proportion of unique mobile internet subscribers and their market penetration. The data on network coverage and usage as well as unique (mobile internet and total mobile) subscribers were collected from the GSMA Intelligence database for a wide array of countries worldwide (including 48 Sub-Saharan African countries) for 2010–20.

3G Network Coverage

The evolution of 3G network coverage and population penetration (or usage) is depicted in figure 3.12. Coverage is measured by the share of the population covered by the corresponding mobile network. Usage is proxied by the number of 3G connections per inhabitant. 3G network coverage has increased in all regions (industrial countries, Sub-Saharan Africa, and other developing countries) over the past decade, although at different speeds. The percentage of the population covered by 3G networks in industrial countries increased from 76 percent in 2010 to near universal coverage (98 percent) in 2020. The surge in network coverage is even steeper for other developing countries and Sub-Saharan Africa: 3G network coverage grew from 48 percent of the population in 2010 to 93 percent in 2020 in other developing countries, while it nearly tripled in Sub-Saharan Africa (rising from 26 percent of the population in 2010 to 77 percent in 2020). Although the region exhibits the lowest 3G network coverage over the past decade, it registers the fastest pace of progress, with an annual average growth rate of 12 percent. Actual access (or usage), as captured by the number of 3G connections per inhabitant, is typically lower than coverage and exhibits diverging trends between industrial countries and developing...
countries (including Sub-Saharan Africa). After reaching a peak in 2014, market penetration of 3G connections declined among industrial countries—thus reflecting the rollout of 4G technologies in these countries. Actual access in other developing countries and Sub-Saharan Africa has grown steadily, although at declining rates. Yet, actual access is considerably lower than coverage by 3G networks. On average, 3G networks covered 77 percent of the population in Sub-Saharan Africa by 2020, while the market penetration of 3G connections was slightly greater than 40 percent (figure 3.12, panel A).

The evolution over time of 3G mobile network coverage and usage across country groups in Africa over 2010–20 is plotted in figure 3.12, panel B. There has been a sharp increase in 3G network coverage in the WCA region as well as the ESA region. The pace of progress in network coverage varies across groups. 3G mobile network in WCA expanded from 21 percent of the population in 2010 to 72 percent in 2020, while that in ESA grew from 28 percent of the population in 2010 to 81 percent in 2020. 3G mobile coverage in ESA and WCA trail that in North Africa throughout the decade. By 2020, the 3G wireless mobile network reached nearly 95 percent of the population in North Africa. The coverage of actual access to 3G networks in these country groups is lower. On average, the market penetration of 3G connections in North African countries has started to decline, while that of WCA countries has continued to grow at increasing rates. Yet, 3G networks covered 72 percent of the population, while there were only 42 connections per inhabitant by 2020.
The internet has often been at the centerstage of the different measures undertaken by governments, businesses, and other communities to respond to COVID-19. Many of these measures are likely to persist in the aftermath of the pandemic, as they have elicited cheaper and more efficient ways to run many business functions and deliver education, health, social protection, civic education, and other services.

Heightened focus on access and affordability of voice and data connectivity, given the need to enforce rules on social distancing, is reflected in first-response government interventions and actions by mobile operators to reduce prices, avoid disconnections for lack of payment, and increase bandwidth. These measures have been accompanied later by actions to facilitate network expansion and reduce congestion, such as adoption of new technologies (for example, Google Loon in Kenya and Mozambique) and temporary release of additional spectrum (Ghana, South Africa, and Zambia).

Governments are also strengthening public backbones and, in some cases, expanding the scope of small and medium-size enterprises, although this has the potential of crowding out private investment. Governments have also partnered with the private sector to deliver online services, such as public health information and e-learning, and ease the use of digital payments. Figure B3.3.1 shows the composition of 144 digital policy responses to COVID-19 pandemic recorded for 31 Sub-Saharan African countries from March to July 2020. Around half of the initiatives were launched by the private sector and the rest were led by governments or built on public-private partnerships. About three-quarters of the responses focus on digital services and the rest on digital infrastructure.

**FIGURE B3.3.1: Digital Sector Responses to the COVID-19 Pandemic in Sub-Saharan Africa**

A. Digital infrastructure responses to COVID-19 in Sub-Saharan Africa

- **Spectrum Policy**: 26%
- **Network Expansion**: 22%
- **Affordability**: 45%
- **Tax Relief**: 2%
- **Support operators or ISPs**: 5%
- **COVID-19 tracking**: 2%
- **Business continuity**: 8%
- **Telematics**: 2%
- **Public health information**: 18%
- **Digital Payments**: 33%
- **E-learning**: 26%
- **COVID-19**: 4%

B. Digital services responses to COVID-19 in Sub-Saharan Africa

- **Telemedicine**: 2%
- **Public health information**: 18%
- **COVID-19 tracking**: 4%
- **Healthcare connectivity**: 9%
- **Digital Payments**: 33%
- **E-learning**: 26%


Note: Includes information on public and private sector responses to COVID since March 2020 collected through online research and therefore is not an exhaustive list of responses for all countries, but instead a subset of response types observed and recorded during the emergency and recovery phases of the pandemic.
The COVID-19 pandemic and the ensuing lockdown measures affected internet traffic around the world, including Sub-Saharan Africa. During the months of “stay-at-home” orders, there was a rapid and sustained increase in data traffic. For instance, internet exchange points in Cape Town, Johannesburg, and Durban showed an increase of 30 percent in internet traffic at the onset of the great lockdown. South Africa is still experiencing higher internet traffic, at around 45-48 percent above the pre-lockdown period. Increased traffic affected quality of services, but as public and private stakeholders responded swiftly with a series of measures to ease access to the internet, speed was restored and even increased in some countries. Private telecommunications operators in Sub-Saharan Africa implemented data capacity upgrades—for example, Orange doubled the capacity of all data plans for free in Mali. Public regulators updated their spectrum allocation policies—for example, the Zambia Information and Communications Technology Authority released additional spectrum for free to boost internet efficiency (Comini 2020).

**BOX 3.3**

Continued

4G Network Coverage

4G broadband cellular network coverage and usage (or actual access) is depicted in figure 3.13. The percentage of the population covered by 4G networks expanded rapidly across all regions—although later and at a faster pace in developing countries (figure 3.13, panel A). Over the past decade, the coverage of 4G mobile networks increased from 17 percent of the population in 2010 to 96 percent in 2020 among advanced countries (that is, growing at an annual average rate of 19 percent over the past decade). Growth was even faster among developing countries, with the percentage of the population covered increasing from 7 percent in 2010 to 81 percent in 2020. In the case of Sub-Saharan Africa, 4G network coverage grew from 9 percent in 2012 to 55 percent in 2020 (that is, it increased at an average annual rate of 25 percent). Yet, rates of market penetration (actual access) are considerably lower—especially among developing countries and Sub-Saharan Africa. The gap between coverage and actual access is not as marked among advanced countries: while 96 percent of the population is covered by 4G networks, market penetration is about 72 percent. In Sub-Saharan Africa, 4G networks cover an average 55 percent of the population, while market penetration is below 14 percent by 2020.

The trends of 4G network coverage and usage (as proxied by market penetration) across subregions in Africa over the past decade are presented in figure 3.13, panel B. There is a marked increase in network coverage across all subregions, with WCA growing at a faster pace. Network coverage expanded from 8.6 percent of the population in 2013 to 47 percent in 2020 across WCA countries, while it jumped from 18 percent in 2013 to 61 percent in 2020 across ESA countries. Again, North Africa has greater coverage than the two other subregions—providing access to 78 percent of the population in 2020. The access-coverage gap in 4G networks is even greater than that of 3G networks for all country groups. For instance, 4G networks cover 47 percent of the population in WCA countries, while the average market penetration of 4G connections is 8.6 percent. In the case of ESA countries, 61 percent of the population is covered by 4G networks, while there are 14 connections per 100 people by 2020.

51 4G wireless mobile technology was the first to provide ultra-broadband internet access.
4G mobile network coverage varies widely across countries in Sub-Saharan Africa. In 2020, 4G networks cover more than 90 percent of the population in three countries, namely, Mauritius, Rwanda, and South Africa (all of them in the ESA subregion). At the other extreme of the distribution, in four countries (Burkina Faso, the Central African Republic, Guinea, and Niger) 4G networks cover less than 20 percent of the population (these countries are in the WCA subregion). Finally, actual use of 4G networks (as proxied by market penetration) is considerably less than the coverage for most countries in the region. About half of the countries with available data (22 of 43 countries) have a market penetration that does not exceed 10 percent (that is, fewer than 10 connections per 100 inhabitants).

**Share and Usage of Mobile Broadband-Capable Connections**

The adoption of the internet in African countries can also be assessed by the penetration of mobile broadband-capable connections in the market (as a percentage of total connections and the population). The share of mobile internet connections is defined as the proportion of unique mobile internet subscribers in total unique subscribers. Usage is measured by the number of 4G connections per inhabitant. Figure 3.14 plots the proportion of mobile internet subscribers as a share of total mobile subscribers and the population across advanced countries, developed countries, and Sub-Saharan Africa (panel A). It shows that the share of subscribers with internet-enabled devices has increased across all regions (advanced countries, developing countries, and Sub-Saharan Africa). Declining mobile data costs and greater demand might explain this trend—and, in turn, the increase in demand responded to more relevant content and improved network quality (GSMA 2019). The share of mobile broadband-capable subscribers increased from 39 percent of total connections in 2010 to 80 percent in 2020 among

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52 Although 4G networks cover nearly the entire population of Rwanda in 2020, the market penetration of 4G connections is 8.5 percent. The low usage might be attributed to the high price of 4G devices.
advanced countries. The share is lower in developing countries (68 percent in 2020, up from 27 percent in 2010), and Sub-Saharan Africa (56 percent in 2020, up from 17 percent in 2010). Still, the number of unique mobile internet subscribers per inhabitant is significantly lower. The percentage of mobile unique subscribers in the total population is about 66 percent among advanced countries by 2020, while it is 46 percent in developing countries and 28 percent in Sub-Saharan African countries.

The evolution of the share of unique mobile internet subscribers in total subscribers as well as the population penetration within country groups in African is plotted in figure 3.14, panel B. The share of mobile internet in total mobile subscribers jumped from 17 percent in 2010 to 55 percent in 2020 across WCA countries, while it increased from 16 percent in 2010 to 56 percent in 2020 among countries in the ESA subregion. The share of unique subscribers that have mobile internet-enabled connections in North Africa has been higher (65 percent in 2020) than in the other African subregions. However, market penetration of mobile internet subscribers is low for the African country groups: the percentages of the population with a mobile internet subscription are, on average, 27 and 29 percent for the WCA and ESA subregions, respectively. Finally, there is greater variability in the share and penetration of unique mobile internet subscribers in Sub-Saharan Africa. The percentage of the population with a mobile internet subscription in 2020 exceeds 40 percent in six Sub-Saharan African countries (South Africa, Mauritius, Lesotho, the Seychelles, Botswana, and Cabo Verde). The population penetration fails to surpass 20 percent for nine countries in the region (the Comoros, the Central African Republic, Somalia, Burundi, Niger, Liberia, Chad, Malawi, and Madagascar).
**Barriers to Mobile Internet Adoption**

Mobile penetration has increased significantly across all regions, although at different speeds. Yet, mobile phone ownership in the Sub-Saharan Africa region has reached less than half of the population (a penetration rate of 45 percent in 2018). Mobile ownership in leading developing regions has exceeded three-quarters of the population—for example, Eastern Europe and Central Asia (84 percent) and East Asia and the Pacific (78 percent). The low levels of mobile phone ownership in Sub-Saharan Africa restrict mobile internet adoption.

Surveys undertaken by Research ICT Africa (RIA) show that the affordability of devices and lack of awareness are the main barriers to internet use in the nine survey countries. Affordability of internet-enabled devices is the main barrier to access in Mozambique (76 percent of the population surveyed), Tanzania (64 percent), Uganda (51 percent), and Rwanda (43 percent). Lack of awareness is the main barrier in Ghana (43 percent of the population surveyed) and Nigeria (40 percent). Unaffordable service costs are a barrier for 15 percent of the population surveyed in South Africa and 33 percent in Rwanda (Research ICT Africa 2019).

Evidence from Senegal for 2018–19 shows that the main drivers of individual mobile internet adoption are household welfare (measured by consumption per capita), age, gender, tertiary education, living in an urban area, language, and employment status (figure 3.15). Thus,
purchasing power (ability to consume per capita) here plays a similar role to affordability in determining mobile internet adoption, in addition to affordability. The results show that increasing per capita expenditure by CFA 341,961 (equivalent to one standard deviation of the mean per capita expenditure) would increase mobile internet adoption by 14 percent. There are also digital skills gaps across socioeconomic groups in terms of gender, skills, and age. Being a woman lowers the likelihood of adoption by 5 percent, while having tertiary education or higher is associated with an additional 16 percentage points in the probability of adopting mobile internet, stressing the importance of education. Individuals who are between ages 25 and 40 years are 21 percentage points more likely to have access to mobile internet (Rodríguez-Castelán et al. 2020c). These findings highlight the need for gender-, skill-, and age-specific approaches in promoting digital technology adoption.54

The finding that purchasing power is the one of the most important factors for mobile broadband internet adoption puts emphasis on the importance of competition in driving the adoption of digital technologies. Simulation exercises show that greater competition in the Senegalese mobile internet market would lower prices, which would raise households’ purchasing power and lead to welfare gains (Masaki, Ochoa, and Rodríguez-Castelán 2020). Policies that increase competition among mobile network operators may lead to greater efficiency and affordability and increased quality of services.

**Mobile data and internet-enabled devices are still expensive in Africa despite declining costs.** The cost of acquiring mobile data as a share of (average) income has been declining over time; however, the cost of 1 gigabyte (GB) still exceeds 2 percent of monthly GDP per capita in more than half of the developing countries.55 The (median) cost of 1 GB declined from 2.9 percent of monthly GDP per capita in 2016 to 2.2 percent across developing countries in 2018 (GSMA 2019). Still, there is wide variation across regions. Purchasing mobile data is more expensive in Sub-Saharan Africa (6.8 percent of monthly income per capita) than in South Asia. Within Sub-Saharan Africa, more than three-quarters of the countries have affordability levels that exceed the 2 percent target. Developing an inclusive digital economy requires mobile data to be affordable for the poorest. The cost of purchasing mobile data for the bottom quintile of the population is still expensive in developing areas (that is, it is above the 2 percent target for all regions) and it is particularly higher in Sub-Saharan Africa, at 39 percent of monthly income per capita (figure 3.16).

In contrast, the cost of internet-enabled devices has declined at a much slower pace than the cost of mobile data. The (median) cost of an entry-level device in developing countries dropped slightly, from 23.7 percent of monthly income per capita in 2016 to 23 percent in 2018. About one-quarter of developing countries face costs of entry-level devices that exceed 50 percent of monthly income. On average, the price of a mobile device as a percentage of personal income is the cheapest in Latin America (at 16 percent of monthly income per capita), while it is the most expensive in Sub-Saharan Africa (69 percent). The cost of a mobile device relative to income per capita is prohibitive for the poorest segments of the population. On average, the price of an internet-enabled feature phone for

54 Box 3.4 provides additional evidence on the household welfare effects of internet-based business technologies in Senegal, as well as of the main drivers of mobile internet adoption.
55 The Broadband Commission for Digital Development targeted entry-level broadband services to be made affordable in developing countries at less than 2 percent of monthly gross national income per capita by 2025.
Purchasing mobile data is more expensive in Sub-Saharan Africa.

FIGURE 3.16: Cost of 1GB Data in Developing Countries, by Region

The cost of a mobile device relative to income per capita is prohibitive for the poorest segments of the population in the region.

FIGURE 3.17: Price of Internet-Enabled Devices in Developing Countries, by Region

the bottom quintile is approximately 81 percent of monthly income per capita in Latin America and 89 percent in East Asia. In Sub-Saharan Africa, the cost of such device among the poorest segments of the population is 375 percent of their monthly income (figure 3.17).
The high price of internet-enabled devices is not the only obstacle for mobile internet penetration in developing countries. Payment plans are not an option in most post-paid markets in developing countries. Consumers in these countries need significant resources, especially those in lower-income households, for one-off purchases rather than being able to purchase these devices in monthly installments. Fostering an inclusive digital economy includes connecting the unconnected by offering payment plans to acquire internet-enabled devices. For instance, Safaricom launched the Maisha Ni Digital (“Life is Digital”) campaign in partnership with Google to improve access to smartphones and the internet. In July 2019, Safaricom introduced affordable 4G devices in Kenya (ranging from US$35 to US$55) to provide the digital experience for customers without smartphones. Customers are also offered payment plans for phone upgrades and personalized data plans (GSMA 2019). Furthermore, technological advances are delivering new smartphones at lower prices. For instance, Orange partnered with Itel and KaiOS Technologies to launch a new 4G version of their Sanza phone, “Sanza XL,” in December 2019. It is being offered for US$28 in Botswana, Cameroon, Côte d’Ivoire, Egypt, Jordan, Mali, and Senegal. Plans for expansion to other African countries were expected before the end of 2020.

**Digital Economy as a Platform to Boost Productivity and Job Creation**

Adopting digital business solutions can have an impact on firms’ sales and productivity and, through higher levels of production, on better jobs for more people. For instance, using an e-mail to connect with suppliers or clients, or having/gaining online presence through a business website can have an impact on the revenue productivity of firms through different channels. From the demand side, the reduction of search and transaction costs has an impact on the firm’s profitability by enhancing access to new clients (extensive margin) or bolstering the number of online transactions of existing clients (intensive margin). Greater profits, in turn, might enable firms to invest in innovation, managerial upgrading, or technological adoption. From the supply side, using an e-mail to connect with suppliers increases the (potential) group of input providers and boosts production efficiency.

Recent research has estimated the impact of the adoption of digital technology on productivity and factor demand in developing countries. Digital business solutions can have a significant impact on firms’ productivity and demand for labor and capital (Cusolito, Lederman, and Peña 2020). Business digitization can potentially have a greater contribution to a firm’s revenue productivity (TFPR) than that of exporting (De Loecker 2013) and managerial experience (Bloom and Van Reenen 2007, 2010). Systematic evidence on the effects of adoption of digital technologies on firm productivity for a cross-section of developing countries is not ample. The gradual arrival of submarine internet cables has a positive impact on firm entry, productivity, and exporting. Employment also increases when fast internet arrives. Increases in skilled jobs do not occur at the expense of unskilled jobs across African countries. Yet, fast internet shifts employment shares to higher productivity occupations (Hjort and Paulsen 2019). Firms adopting digital technologies have also experienced an increase in TFP in Argentina (Brambilla and Tortarolo 2018), Brazil (Dutz et al. 2017), Chile (Almeida et al. 2017), and Mexico (Iacovone and Pereira-López 2018). With the exception of Brazil, firms that have adopted information and

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56 The authors gathered manufacturing firm-level data on sales, input usages, exporting status, managerial experience, and digital technology adoption from the World Bank’s Enterprise Surveys for 82 countries (of which 27 are in Sub-Saharan Africa) for 2002–19. This survey is nationally representative of the formal sector.
communications technology across these Latin American economies exhibit increases in total employment—especially, in low-skilled labor.

Empirical evidence for a large sample of developing countries shows that there is a productivity premium from business digitization; however, this premium varies across firms. Median estimates of the impact of digital technologies on firms’ TFPR suggest that these effects are comparable to the benefits of learning-by-exporting and greater than those associated with managerial experience. The (probability-adjusted) median TFPR premium from using an e-mail is 1.6 percent and that of having a business website is 2.2 percent, while those of exporting and managerial experience are 1.6 and near zero percent, respectively. Furthermore, there is no evidence of job displacement from the adoption of these digital technologies. Instead, business digitization leads to a greater demand for labor and capital by firms (Cusolito, Lederman, and Peña 2020).

Adopting digital business solutions can affect the skill composition of labor demand by firms. Using an e-mail can improve a firm’s efficiency to the extent that it boosts the firm’s connectivity with suppliers of intermediate goods. The firm’s improved efficiency leads to a greater demand for skilled workers in the manufacturing and service sectors. Having a business website, on the other side, will bolster productivity and the demand for skilled workers by boosting transaction volumes and attracting new clients. Recent evidence shows that digital technology adoption has an impact on productivity and the skill composition of labor demand in Sub-Saharan Africa’s manufacturing and service sectors (Cusolito and Patiño Peña 2020). Productivity premiums from using an e-mail have no significant differences between the manufacturing and service sectors in the region. In contrast, the premiums from having a presence online are larger across manufacturing firms relative to services firms. Additionally, adopting business digital solutions can have a scale effect for skilled and unskilled labor. However, there is a skill bias from e-mail adoption across manufacturing and services firms in Sub-Saharan Africa. In the case of having an online footing (a business website), there is greater demand for skilled labor in manufacturing, while there is a larger increase for unskilled workers in services.

The case of Senegal illustrates the drivers of digital adoption, the usage of more specialized digital technologies, and the extent of the digital divides across age and gender, and their association with the business outcomes of microenterprises (Atiyas and Dutz 2020). Smartphones are being used by 16 percent of microentrepreneurial firms in Senegal, significantly lower than for firms with five or more workers (31 percent). Youth-owned microenterprises are twice as likely to use a smartphone than older-owned firms (27 versus 14 percent), while women-owned firms are slightly less likely to use a smartphone than men-owned firms. Microenterprises that have adopted mobile broadband typically have had a loan, have electricity, are more likely to produce services (other than retail trade, relative to agriculture), and are located in urban areas. Schooling is a positive inducement for women-owned firms to adopt. However, although vocational training increases the likelihood of smartphone adoption across the population of firms, its net effect on women seems to be closer to zero or negative. Furthermore, microenterprises using smartphones tend to exhibit higher labor productivity and

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57 The authors use firm-level data for 90 countries over 2002–19 from the World Bank Enterprise Surveys database. The survey provides information on the educational level of the workforce, which allows the calculation of the firms’ share of skilled and unskilled workers. Digital technology adoption is proxied by the information on whether the firm uses business e-mail and a website.

58 The authors use a nationally representative sample of more than 500 firms in Senegal over 2017–18. About 90 percent of these firms are not fully formal and more than 95 percent have five or fewer full-time employees—more than half of the firms in the sample are self-employed household enterprises without full-time paid employees.
sales and are more likely to export relative to those using 2G phones, controlling for having a loan, having electricity, and being fully informal, among other drivers of these outcomes.

The relationship between adoption/use of digital technologies and jobs in Senegal is explored from two dimensions: (1) “jobs for more people” (the extent to which use of digital technologies is positively associated with firms that support more full-time employees), and (2) “better jobs” (the extent to which use of digital technologies is associated with the generation of higher incomes, that is, higher worker wages and per-owner profits). Having a smartphone per se does not matter for generating more jobs (or larger firm size). The largest statistically significant conditional correlate of productivity, sales, and jobs is a more specialized internal-to-the-firm management technology, which is a proxy for management capabilities more generally, namely inventory control/point-of-sale (POS) software—which facilitates documenting and tracking the changing levels of inventories and customer purchases over time, the lifeblood of small companies, rather than writing them on pieces of paper and not being able to consider what they mean for company profits and growth. Women-owned firms, with younger and older owners, are as likely to generate more jobs as men-owned firms. Use of more specialized digital technologies to facilitate external-to-the-firm transactions, namely using mobile money to pay suppliers and receive payments from customers, is also a statistically significant conditional correlate of productivity and sales. Higher average wages are not facilitated by using a smartphone nor by internal-to-the-firm or most external-to-the-firm more specialized uses of digital technologies when controlling for other drivers of labor market outcomes. Rather, the urban location of businesses and the transformational quality of entrepreneurs (whether they select themselves as entrepreneurs due to the profit-making opportunity that owning a business provides as opposed to a necessity or subsistence choice to supplement earnings or because there is no preferred wage job available) are the main variables associated with higher wages. And firms using more specialized digital technologies tend to exhibit higher profits per owner the businesses that have adopted and used these specialized digital technologies have higher incomes per owner than businesses that generically use a smartphone, with differences ranging between 3.7 times for use of inventory control/POS software to 2.9 times for use of online banking. The largest statistically significant conditional correlate of profits per owner, controlling for other labor market drivers, is again inventory control/POS software—as it facilitates business planning and management. The other statistically significant (at least at the 5 percent level) correlates of profits per owner are two digital technologies that facilitate external-to-the-firm transactions, namely using mobile money to pay suppliers and receive payments from customers.

Skill-biased technological innovations have been shown to favor more educated workers and displace less educated ones, especially in more developed economies. However, the evidence for Sub-Saharan Africa so far has documented that digital technologies (for example, the internet) are associated with an expansion of jobs—with no clear displacement, on aggregate, of unskilled labor (Hjort and Paulsen 2019; Cusolito and Patiño Peña 2020).

59 Micro informal firms using smartphones and more specialized digital technologies in all cases are associated with average and median wages above the monthly extreme poverty line, in contrast, the median business of all firms that do not use the available digital technologies—except those using the internet for better understanding customers, interacting with the government, and using accounting software—are only able to pay an average wage that is below the extreme poverty line. The average and median profits per owner across all micro informal firms are above the moderate and extreme poverty lines; entrepreneurial firms generate sufficient profits on average to support the well-being of their owners.
Digital Technologies Have Significant Positive Effects on Household Welfare

Until recently, most studies have focused almost exclusively on the welfare effects for households and workers of the use of phones and 2G technologies. Recent research has shifted toward assessing the household and individual welfare effects of broadband internet (fixed broadband and 3G), particularly among the poor. A recent study of multiple countries in Africa shows that the expansion of fixed broadband internet has enabled more rapid job creation and overall economic activity (Hjort and Poulsen 2019).

Mobile broadband coverage is shown to be welfare enhancing among Nigerian households, as captured by its positive effect on consumption and poverty reduction—especially for poorer rural households (Bahia et al. 2020). Total consumption grows by 6 percent in households with at least one year of mobile broadband coverage. After two and three years of coverage, the positive consumption effect increases (at a decreasing rate over time). Access to and use of internet-enabled mobile networks reduce the proportion of households living in extreme poverty by 4.3 percentage points after a year of coverage, and by 6.9 percentage points after at least two years of coverage. The household welfare effects from internet access are progressive: the increase in total (and particularly food) consumption is larger for poorer rural households. The findings from Bahia et al. (2020) suggest that gains from access to mobile broadband networks are not circumscribed to households participating in modern sectors of the economy; they can also be accrued by poorer, rural households, potentially including subsistence agricultural workers.

Another recent study for Senegal, a country that has experienced a rapid expansion in fixed and mobile broadband internet infrastructure over the past decade, shows that 3G coverage is associated with a 14 percent increase in total consumption (Masaki, Granguillhome-Ochoa, and Rodriguez-Castelan 2020). These effects are larger among households in urban areas, male-headed households, and younger cohorts. The magnitude of the recent results for Nigeria and Senegal can be compared with results in other developing countries, such as Peru and the Philippines. In the case of Peru, rapid mobile phone expansion between 2004 and 2009 was found to increase household consumption by 11 percent and reduce poverty by 8 percentage points (Beuermann et al. 2012). In the Philippines, the introduction of new phone towers in rural areas between 2016 and 2018 led to increases in household income and expenditure of 17 and 10 percent, respectively.

The main mechanisms at play that explain these positive effects of internet access, particularly for those at the bottom of the welfare distribution, are better labor market outcomes, higher agricultural production and productivity, and access to mobile money. In the case of Nigeria, the welfare effects of the internet are driven, at least partly, by greater participation in the labor force and employment, particularly among women. There is also evidence that internet coverage in rural areas in Nigeria is associated with higher agricultural productivity, higher traded volumes of agricultural products, and better use of inputs such as fertilizer and equipment (Masaki, Raja, and Rodríguez-Castelán 2020). These results are linked to plot managers who are younger than age 50 years. In the case of Kenya, better access to mobile money services linked to the
rapid roll-out of M-PESA is shown to have increased household consumption and savings and, thus, reduced poverty rates (Suri and Jack 2017). This study finds that poverty rates declined by 2 percentage points as a result (196,000 households moved out of extreme poverty), and reductions were larger among female-headed households. They also find significant changes in occupation choice, largely among women who moved away from agriculture as their main occupation to business and retail. As a result of M-PESA, 186,000 women made this transition. Similarly, in Tanzania, training sessions for women-owned micro-firms on M-Pawa, a mobile savings account linked to M-Pesa, have helped women save almost four times more, and they were 16 percent more likely to obtain a loan than a comparison group.

As the Africa continent plunges into the digital age, understanding the potential welfare gains households can experience from harnessing digital technologies becomes an important consideration that African governments must take into account. This box focuses on the welfare effects of internet adoption on households. As Senegal gains headway in West Africa as a tech hub, it has significant potential to boost its labor market productivity, wage employment, and agricultural production by increasing internet access in the country. Achieving its 2025 target of 50 percent broadband penetration can have immense effects for different socioeconomic groups. Therefore, understanding how these effects will manifest and how to best achieve this goal is crucial.

Welfare Effects of Digital Adoption

Before examining the welfare effects of digital technologies, it is key to understand the channels of transmission through which digital technologies enhance household welfare and, to an extent, the drivers of adoption and use of digital technologies. One of the important channels through which mobile internet adoption affects household welfare is the labor market. Mobile broadband internet (3G coverage) is found to be positively correlated with salaried employment (Masaki, Granguillhome-Ochoa, and Rodríguez-Castelán 2020). Internet adoption also has positive effects on crop prices, agricultural production and productivity, and wage employment in rural areas (Goyal 2010; Kaila and Tarp 2019; Masaki, Raja, and Rodríguez-Castelán 2020). Another channel of transmission is e-commerce, which has implications for the expansion of mobile money accounts. In turn, the expansion of digital financial services can increase their delivery and affordability. This contribution leads to welfare gains for households, as it facilitates their access to markets and wider information sets, as consumers and producers.

Once adopted, mobile internet broadband coverage has positive effects on total household consumption and lowers poverty rates in Senegal. 3G coverage is associated with a 14 percent increase in total household consumption and a 10 percent decline in extreme poverty (Masaki, Granguillhome-Ochoa, and Rodriguez-Castelán 2020). The effects are larger in urban areas. Figure B3.4.1 summarizes the impacts of an expansion of 3G coverage on household consumption and poverty in Senegal.

Welfare Effects of Internet Adoption Are Different across Groups

Digital technologies have positive effects on welfare in Senegal, although these benefits are not shared equally across groups—thus creating a digital divide. Empirical evidence typically points to education, gender, digital literacy, and age as key determinants of adopting digital
technologies. Purchasing power can also play a crucial role in determining mobile internet adoption. Not only do socioeconomic and demographic characteristics determine adoption of digital technologies, they also affect the magnitude of the welfare impact of digital technologies. This creates heterogeneous effects with varying magnitudes across different groups, including by gender and urban-rural households.

The main drivers of mobile internet adoption in Senegal are household welfare (measured by consumption per capita), gender, age, tertiary education, language, and employment status (Rodríguez-Castelán et al. 2020c). There is also evidence that adoption may be subject to strong network effects: an individual’s likelihood of adoption is highly correlated with the number of friends who use messaging apps such as WhatsApp, Viber, or BBM (Atiyas and Doğanoğlu 2020). The relationship between digital technology adoption and welfare effects, measured by household consumption, runs in both directions. While digital technology adoption has a positive impact on total household consumption, total household consumption also has an effect on digital technology adoption. Internet adoption has increased the gender divide. In urban Dakar, which has attained universal 3G coverage, women are less likely than men to spend money on mobile services. This highlights the need for gender-specific approaches in promoting digital technology adoption. The results showcase that despite the significant improvements in coverage in Senegal since 2016, gaps remain and the adoption of mobile data services and utilization of digital technologies still differs between individuals. Thus, internet access and adoption do not directly translate into usage.

**Policy Implications**

The above findings stress the importance of competition and lower prices in the information and communications technology (ICT) sector in driving digital technology adoption. Competition in the ICT industry can play an important role in encouraging new consumers who were previously priced out of the market. The results of a simulation exercise for Senegal show that increasing competition in the mobile internet market (from three to seven providers) would reduce prices by over 30 percent, which would in turn increase new market entrants as well as the purchasing power of existing customers, leading to gains in household welfare (Rodríguez-Castelán et al. 2020b). A similar study for Ethiopia shows that reducing the market share to 45 percent of the incumbent monopoly in mobile services (the state-owned enterprise Ethio Telecom) would likely reduce poverty by 0.31 percentage points (from 24.21 to 23.90 percent).

**BOX 3.4 Continued**

![Graph](image)


*Note: Point estimates at 5 percent confidence intervals. The estimates are from ordinary least squares across consumption types, with standard errors clustered by enumeration area and including household-level controls, demographic controls, and spatial controls.*
The study also finds that about one-third of the likely poverty reduction effect would be due to the impact on new users who were previously priced out of the market (Rodriguez-Castelan et al. 2020a). To realize the full welfare gains from adopting digital technologies, a competitive market structure is required, as it promotes efficiency, affordability, and increased quality of service. Given the potential gains from heightened competition, government policies should be aimed at increasing competition among mobile network operators—as outlined in Senegal’s current implementation of the infrastructure sharing policy.c

Government policies, particularly those that promote social assistance, alleviate the budget constraint for lower-income households and thereby can help remove the financial barriers to adopting digital technologies. Another important area would be for policy to attempt to bridge the quality gap between urban-rural adoption with the promotion of local linguistic content. The Afrobarometer survey in 2018 reported that 46 percent of Senegalese considered Wolof as their first language. If the preferred language is not available online, it then becomes a barrier to internet adoption especially in rural areas and excludes non-French-speaking segments of the population. Evidence suggests that individuals who can read and write in French are 12 percentage points more likely to access the internet through their mobile phones (Rodriguez-Castelan et al. 2020c). Analogous to the gender gap, this creates a target for policy in addressing vulnerable groups and cognitive requirements that promote adoption and usage. Another important policy consideration relates to the synergies between electricity access and internet adoption. Households’ access to electricity is an important driver of internet adoption. Therefore, policies increasing the availability of affordable internet need to include improving the availability of electricity. Finally, evidence on the importance of network effects suggests that requiring providers to offer low-cost, entry-level “friends & family” type plans that would not be of interest to existing higher-paying customers may help encourage adoption. Digital social networks are an important driver of household uptake: an increase from one to five in the number of friends who use messaging apps is associated with a rise in the adoption probability for households from 1.6 to 29 percent in Ghana, 2.7 to 36 percent in Senegal, and 5.7 to 49 percent in South Africa (figure B3.4.2).

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a. Welfare is approximated by total household consumption or consumption per capita. See, for example Masaki, Ochoa, and Rodriguez-Castelan (2020); Rodriguez-Castelan, Ochoa, Lach and Masaki (2020); and Rodriguez-Castelan, Lach, Masaki and Ochoa (2020).

b. Extending digital infrastructure and internet access may lead to more jobs created outside of the ICT sector through lower search times and decreased transaction costs for people finding jobs (World Bank 2016).

c. However, the Senegalese telecommunications market has been predominantly dominated by Orange group and has often been categorized as having low competition with higher prices. Based on the ITU (2019), Senegal ranked 164th of 182 most expensive countries for its high-consumption mobile-data-and-voice price basket. Mobile telecommunications bundles made up 25.3 percent of its gross national income per capita.
High-Speed Internet and Entrepreneurship

As the lines are blurred between households and micro-entrepreneurship in Africa, broadening household access to high-speed internet not only bolsters entrepreneurship, but also has stronger economic inclusion effects in the region (provided the productivity of entrepreneurs increases). Access to the internet can foster innovation through a series of channels: reduced information and search costs, lower production costs (say, through digitization), expanded business networks, and greater access to markets regardless of their geographical distance. Access to the internet can also bolster entrepreneurship. For instance, the use of digital technologies can alleviate or remove market entry costs faced by micro, small, and medium-size enterprises. These entrepreneurs can sell their products online rather than selling directly in neighboring local markets. In this context, entrepreneurs need to have a fast and reliable connection to reap the potential gains from internet access. Recent research assesses the causal impact of high-speed internet on entrepreneurship and innovation in Africa (Houngbonon, Mensah, and Traore 2020). Specifically, it evaluates the effects of internet access on process and product innovation among firms and across sectors of economic activity. It also investigates whether (aggregate and sectoral) entrepreneurship rates are enhanced by having access to fast internet and the role of complementary analogs, such as access to reliable provision of electric energy.

The evidence shows that access to high-speed internet has a positive and significant impact on process innovation but not on product innovation among African firms. The likelihood of internet-adopting firms undertaking process innovation increases by 8.6 percentage points, and this effect is primarily driven by internet-related process innovation activities (for example, online sales and marketing, among others). Access to high-speed internet is also found to promote entrepreneurship in Africa. Once high-speed internet arrives to the community, the likelihood of an African household setting up and operating a nonfarm business is 4.7 percentage points higher. Compared with the mean, this impact can be translated to a nearly 12 percent increase in the entrepreneurship rate. The increase in entrepreneurship is primarily driven by households setting up firms in the service sector rather than in manufacturing and agribusiness. This finding might be attributed to the relatively low costs of setting up and operating service-related firms. Finally, the impact of high-speed internet on innovation and entrepreneurship is strengthened by the adequate provision of analog complements—particularly the provision of reliable and affordable electricity (Houngbonon, Mensah, and Traore 2020).

Universal access to mobile broadband in Africa. As argued above, the sizable welfare effects—which operate through productivity gains, job creation, and higher incomes—may incentivize policy makers in the region to pursue policies to achieve universal internet access in Africa. Yet, the infrastructure network of the digital economy is lagging across Sub-Saharan African countries—whether it is internet provision via fixed broadband technologies, cellular technologies, or satellite communications. For instance, the (median) 3G mobile network coverage of the region in 2020 is about 77 percent of the population (which is below the 93 percent in other developing countries), while the (median) 4G mobile network covers 55 percent

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63 Two sources of exogenous variation are used to address causality: (1) the staggered arrival of submarine fiber optic internet cables in Africa over 2009–14, and (2) the ensuing rollout of the terrestrial fiber internet backbone network across the continent. The spatial data on the deployment of high-speed internet are matched with georeferenced data on households and firms in African countries.
as opposed to 81 percent in other developing countries). Thus, 4G mobile networks in Sub-Saharan Africa cover less than half of the population in 17 countries.

How much would it cost to provide universal broadband service in the region? According to the Broadband Commission, meeting the 2030 target of affordable universal access in Africa would require US$100 billion to cover capital investment, network operation and maintenance, digital skills and content, and policy and regulation.64 Moreover, recent research has estimated the cost of universal broadband provision using a combination of different technological solutions—say, cellular technologies (3G, 4G, or 5G) in areas that are not covered by existing internet connectivity (fiber optic cables or microwave for backhaul connections) or satellite communications in areas where the cost of deploying the underlying infrastructure is prohibitive (Oughton 2020).65

Estimates of the median cost per user for universal broadband in Sub-Saharan Africa show that, first, it is more expensive to expand broadband coverage in areas with lower population density. This might be attributed to low initial investments in digital assets, high fixed costs (tower and equipment) per user, and long distance for backhaul connections. Second, the deployment of 4G technology is cheaper than 3G due to the higher spectral efficiency (that is, greater data transmission over the same spectrum capacity). The cost savings are sizable, especially in rural and remote locations. Expanding the 4G network using a wireless backhaul is probably the most cost-efficient technology for deployment in the region (Oughton 2020). Preliminary baseline estimates of the total cost of providing universal broadband across countries in the Africa region (set to a universal broadband service of 2 Mbps per user) suggest that the mean costs fluctuate from nearly US$400 billion for 3G with fiber backhaul, down to US$75 billion for 4G with wireless backhaul (figure 3.18).

Finally, the estimated gross investment needs to achieve universal broadband in Sub-Saharan Africa, by subnational region, show that less populated areas (that is, rural and remote locations) are typically characterized by smaller costs per square kilometer but with an extensive area that needs to be covered. Economies of scale are considerably diminished when compared with more densely populated areas. This implies that investment needs are larger in locations clustered in the

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Expanding the 4G network using a wireless backhaul is probably the most cost-efficient technology for deployment in the region.

Source: Oughton 2020.

Note: Preliminary estimates as of July 2020. The universal broadband service is set to the target user capacity of 2 megabits per second per user. The scenarios reflect different levels of adoption rates given population density levels. FB = fiber backhaul; MW = wireless backhaul.

64 Broadband Commission for Sustainable Development (2019).

65 The author models the cost of six different strategies to expand 3G and 4G mobile networks in three East African countries (Kenya, Tanzania, and Uganda) and three West African countries (Côte d’Ivoire, Mali, and Senegal). These estimates are then projected to other areas based on population density—as this factor predominantly affects broadband viability. For more details on the different scenarios of adoption and the infrastructure strategies used to estimate the cost scenarios, see Oughton (2020).
Saharan region (for example, subnational areas in Mali, Niger, Chad, and Sudan) and Central Africa (including the Democratic Republic of Congo), among others (Oughton 2020).

**Policy Implications**

Mobile markets are developing fast in Sub-Saharan Africa and large investments have been undertaken in international connectivity, national backbones, and access networks. Digital technologies are also spreading rapidly. However, the adoption of digital technologies by households, firms, and governments in the region still lags that of other regions in the world; and there are large digital divides by urban-rural, gender, and size of enterprises differences. Further uptake of digital technologies is hindered by limited affordable and quality internet connectivity as well as a lack of widespread availability of adequate digital services to pull demand for digital technologies, coupled with low levels of digital literacy. Therefore, policies are needed across various areas: digital infrastructure for connectivity, digital business models and digital financial services to provide appropriate digital services across economic sectors, public digital platforms and e-government services to create an enabling environment for business and pull demand for digital technologies, and digital skills and capacity to address digital literacy gaps.

More effective regulation is needed to expand digital infrastructure and make connectivity affordable, reliable, and universal. This entails using regulatory instruments and government interventions to eliminate barriers to entry (such as restrictive licensing and exclusivity rights) and promote competition on a level playing field (such as asymmetric regulation of dominant operators, infrastructure sharing, spectrum policy, and antitrust enforcement). Governments can also implement programs targeted at providing universal access through a combination of various instruments, including universal service funds to partner with the private sector, supply or demand subsidies, and public investments. Government subsidies and other incentives for broadband and mobile providers should be granted to all providers on equal terms without preferential treatment for state-owned enterprises. At the same time, regulatory frameworks in Sub-Saharan Africa should minimize undue regulatory burden on the sector, such as command and control rules that are not capable of accounting for the complexity of regulation and lack of adequate implementation or enforcement. Figure 3.19 provides a roadmap for universal access that highlights the roles of the public and private sectors. In general, in the digital sector, regulatory frameworks also need to shift toward a paradigm of fast adoption of technological change and more competitive market dynamics under an agile regulation approach. Hence, there is a need to address the persistence of dominant positions and onerous barriers to market entry, complex and burdensome tax and parafiscal fees schemes, and gaps in regional harmonization.

The COVID-19 pandemic has brought to the fore not only the vital importance of the digital economy in the lives and livelihoods of the different actors in society, but also having adequate rules and policies regulating the digital sector. In this context, there is an important agenda that needs to address issues such as: (1) universal affordable access to high-quality communications services as a common good, (2) support for critical functions (for example, hospital emergency

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66 This section draws heavily from the World Bank (2020h, 2020i)
67 Design of apps tailored to Africans’ needs should be encouraged to make digital adoption more attractive and accelerate the positive impact of digitization on productivity. Power and data-efficient apps that deliver real value for customers are critical. They can be instrumental in supporting areas such as education (Eco-Warriors and Mwabu), health (Vula, 54gene and Appy Saúde, and agriculture (GeoFarmer, Nuru and Promagric).
68 These are the core pillars of the Digital Economy for Africa (DE4A) initiative. For more information, see https://www.worldbank.org/en/programs/all-africa-digital-transformation.
services and e-administration), (3) public warning systems, (4) effective privacy (personal data protection), and (5) high network resilience (cybersecurity and data protection). To face the challenges in the COVID-19 and post-COVID-19 era, countries need regulatory frameworks and practices that foster the emergence of competitive digital infrastructure markets, promote innovation, adapt swiftly to changes in the demand for electronic communications services, and pursue affordable universal access to high-quality services. Regulatory frameworks must be flexible to address competition and investment in markets shifting from voice to data, close the digital divide, protect personal data, and guarantee cybersecurity.

Digitalization creates risks for industries, governments, and citizens that require government policies to safeguard the integrity and security of digital data and ensure that the competitive process leads to better deals for consumers and users of services offered by digital business models (platforms and data-driven businesses). The vulnerabilities of digital communications to cybersecurity threats are becoming more important, given the increased use of digital solutions, but there are various legal, enforcement, and capacity challenges for effective cybersecurity policies in Africa. Digital data regulations are nascent in Africa, with few countries having updated data protection frameworks and functional data protection authorities. Consumer protection frameworks, although in force across most African countries, are not always prepared to address issues related to online purchases of goods and services. Furthermore, small suppliers to digital platforms have few instruments for legal recourse. Although more than 30 countries and regions in Africa have competition authorities in operation, few cases involving digital markets have been handled, and in many cases legal frameworks need to be updated to allow for effective implementation in a digital economy. Digital IDs could facilitate citizens’ use of digital government services and access to digital products, such as credit and insurance, but only 40 percent of African citizens have an ID, limiting the usage of integrated public platforms to

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69 The World Bank’s Regulatory Watch Initiative identifies the regulatory actions that can yield more competitive markets for electronic communications (World Bank 2020k): (1) establishing openness in licensing regimes (for example, competitive bidding of licenses and transparency in market information), (2) easing access to bandwidth (for example, competition for international capacity, wholesale price regulation, and open access rules for national connectivity), (3) removing taxes and price floors on incoming international traffic, and (4) avoiding “anti-over-the-top” (OTT) measures (for example, blocking access to OTTs and imposing taxes on social media, among others).


provide social services and deliver social protection measures (for example, cash transfers), such as the ones demanded by the COVID-19 crisis.

To facilitate resilient recovery in the medium term, deeper reforms are needed to boost the sector’s performance in terms of access and affordability. Governments should focus efforts on achieving universal, affordable, and good quality broadband access by mobilizing private sector financing under a competitive environment and designing appropriate programs and rules to foster inclusive connectivity. Although most African countries have telecommunications regulators and relatively modern telecommunications frameworks, challenges persist to rules and effective enforcement in the following areas: regulating operators with significant market power, entering certain markets such as international gateways or facility-based internet services, granting access to public resources such as spectrum and rights of way, sharing infrastructure within the telecom sector and with other sectors, ensuring competitive neutrality in the treatment of state-owned enterprises and operators with state participation, having an effective universal service policy, and applying a balanced framework for taxation and parafiscal fees.

Public investments and mechanisms to incentivize digital technology adoption and the development of tailored digital solutions are needed to foster the digitalization of industries and government systems. Countries such as Senegal are designing frameworks to support digital startups, while other countries are interested in developing frameworks to facilitate the development of digital solutions and digitalization of government functions and industries, including SMEs. Worldwide, COVID-19 stimulus packages are targeting the digital economy. Countries have included digital and data infrastructure and technology innovation as centerpieces of national COVID-19 stimulus packages (for example, the European Union, the Republic of Korea, and China), while recovery plans have also covered increasing support for digitalizing SMEs and investing in innovation and research to build a digital-driven ecosystem (for example, Singapore, the European Union, Israel, Malaysia, Spain, Lithuania, and India). African countries could benefit from designing specific programs and undertaking public investments to support the digital ecosystem while providing incentives for firms to innovate and build on international know-how and capital.

In addition to public investments and state support, effective regulatory frameworks that incorporate an agile approach are needed to regulate new digital business models, and enabling rules on cybersecurity, data governance, consumer protection, and competition policy are necessary to create trust for greater use of digital solutions.

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72 According to the 2018 ITU regulatory index, around 85 percent of the countries in Sub-Saharan Africa include in their laws or regulations at least one provision on one of the following areas: regulation of significant market power, spectrum trading and neutrality, and infrastructure sharing. Preliminary analysis shows that these areas of policy are related to higher mobile penetration after controlling for other factors, such as market concentration, GDP per capita, and age of the regulator (Aviongoh et al. 2020).

73 See Begazo and Tang (2020).
3.3 URBANIZATION AND SPATIAL INTEGRATION

Across the globe, well-functioning cities do one thing really well—they bring people and businesses together. Social and economic interactions are the hallmark of city life, making people more productive and often creating a vibrant market for innovations by entrepreneurs and investors. No country in the industrial age has ever achieved significant economic growth without well-managed urbanization (World Bank 2008).

Successful urbanization benefits the rural population as much as those who move to towns. Rural living standards are able to rise as people move to towns because each remaining person has more resources to work with, remittances from urban to rural areas increase, and higher urban demand for food raises rural earning power.

The COVID-19 pandemic is putting the brakes on urban economies and highlighting social and spatial disparities within cities like never before. An outsized burden of the pandemic on lives and livelihoods has been borne by the urban poor. Several factors put the urban poor, especially those living in slums, at high risk for contracting infectious diseases such as COVID-19 (Baker, Cira and Lall 2020). These risks are particularly linked to: (1) overcrowded living conditions (both within slums and within households); (2) limited access to basic services, particularly water, sanitation and health services; (3) reliance on crowded transport services; and (4) specific aspects of working in the informal sector (often in crowded places, with no social protection to fall back on).

Contagion risk is challenging in (Sub-Saharan) Africa where over 60 percent of the region’s urban population lives in slums. Risk is exacerbated by cramped living conditions and inadequate public services, especially water and sanitation. In Dar es Salaam, 28 percent of the residents live at least three to a room; 50 percent of Abidjan is overcrowded. Residents lack open space and suffer from inadequate infrastructure, sharing taps and latrines, often with 200 people per communal facility. In South Africa, only 44 percent of the people have access to water inside their house and only 61 percent have access to a flush toilet (Lall, Henderson and Venables 2017).

Recent analytical work conducted at the World Bank shows that the COVID-19 virus has spread the fastest in urban zones where people lack access to indoor floor space, sound infrastructure, and the capacity to spend time safely outdoors distanced from others (Lall and Wahba 2020). A major concern is a city’s economic geography: the interplay between its economic and physical setting. Unfortunately, many of Africa’s cities share two characteristics that constrain their economic geography: they are crowded and disconnected, not economically dense and connected.

One of the most striking features is that Africa is urbanizing in people, but not in capital. Cities are experiencing rapid population growth, yet their economic growth has not kept pace. Here, Africa’s cities are crowded because they lack formal, planned housing that is connected to jobs and services. A major part of the challenge is that Africa is urbanizing at lower incomes levels—it is strikingly poorer than other developing regions with similar urbanization levels. In 1994, when countries in the East Asia and Pacific region surpassed the same threshold, their per capita GDP was $3,600. By contrast, Africa, with 40 percent urbanization, today has a per capita GDP of just $1,000. Housing

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74 This section was prepared by Somik V. Lall and Aparajita Goyal.
investment in Africa has also lagged behind that in other low- and middle-income economies. Between 2001 and 2011, African low income countries invested 4.9 percent of GDP in housing, compared with 5.5 percent elsewhere; and African middle-income countries invested 6.5 percent of GDP in housing, compared with 9 percent elsewhere (Dasgupta, Lall, and Lozano-Gracia 2014).

Africa's cities are also growing under a patchwork of constraints — inefficient land markets, overlapping property-rights regimes, and suboptimal and ineffective zoning regulations — that hinder the drive toward dense concentrations for whatever structures that do exist. The resulting scattered disconnected neighborhoods lack planned transport and infrastructure connections (Lall, Henderson and Venables 2017). The constraints also make it challenging for city authorities to provide network services, such as water supply systems and sewers that rely on scale economies. Limited transport infrastructure further disconnects the cities.

Such features of crowded and disconnected cities increase contagion risk and vulnerability during the pandemic and have been increasing costs for households and businesses over several decades. African cities are 29 percent more expensive than cities in countries at similar income levels. The need for higher wages in the formal sector to pay higher living costs makes firms less productive and competitive, keeping them out of tradable sectors. As a result, African cities are avoided by potential regional and global investors and trading partners. The cities remain local in scope—dampening their competitive potential.

Policies and investments to manage the employment and economic shocks from COVID-19 in urban areas can be organized around (1) immediate interventions to manage COVID-19 risk, and (2) medium-term measures to tackle broader structural and institutional challenges that shape the visible symptoms.

Immediate interventions to manage COVID-19 economic risks. Labor-intensive public works are part of the short-term solutions for managing the employment impacts, particularly when other options, such as wage subsidies and access to unemployment insurance are limited. Purely as a short-term safety net, public works in this case intend to provide cash incomes to self-selected participants in times of need and do not typically include other developmental roles such as skills development. The priorities would be to focus on activities that are labor intensive (e.g.) as well as modify the technologies and increase the labor intensities of selected construction activities. Considering the major infrastructure and service deficit in Africa’s cities, particularly in informal settlements, these interventions would help in longer term development.

Medium-term priorities for effective spatial development, laying the foundations to reap economic benefits from urbanization. These priorities include strengthening rural urban linkages to support rural diversification; simplifying and clarifying transfers of property rights among land market participants (freeing these procedures from today’s unclear, overlapping property-rights regimes); supporting the effective management of urban development through foresighted planning, realistic regulation, and predictable enforcement; and making infrastructure investments early and coordinating them with land market intentions and plans and regulations that guide physical structures. Their aim should be to achieve urban and spatial development at scale and for scale, while fostering economic specialization.

Boosting Agricultural Productivity and Food Security

An important part of Africa’s urbanization challenge has been the lack of opportunities in the countryside. With no accumulated savings to make significant investments in housing, the default option has been to build shacks in urban centers. Consequently, 60 percent of the region’s urban population lives in slums. With Africa’s urban population likely to double over the next 25 years, there is an urgent need to make cities livable and productive. Important preconditions for successful urbanization are boosting agricultural productivity and improving living conditions in rural areas, with food security especially in the aftermath of the pandemic becoming critical.

The pandemic arrived when the number of acutely food-insecure people in the world was already rising over the past four years, largely due to conflict, climate change, and economic downturn. Through the supply and demand shocks of the pandemic and compounding existing vulnerabilities, COVID-19 continues to have a profound impact on the number of people facing acute food insecurity. Domestic disruptions in supply chains were the dominant factor affecting food security as countries went into lockdowns due to the spread of COVID-19. Mitigation measures put food security at risk through increased prices, high transportation costs, and loss of income, as is analyzed in volume 21 of *Africa’s Pulse*. Since then, many countries have acted to remove the obstacles and keep food moving. The situation appears to be improving in many places in Sub-Saharan Africa, but some issues continue to linger. The focus on increasing productivity remains centerstage, and the role of digital technologies in helping countries and food systems build back better after the pandemic has become even more important.\(^{76}\)

The stark contrast between food surpluses rotting on farms and food shortages in retail markets throughout the lockdowns highlights the high transaction costs and information asymmetries that are pervasive throughout the food system. Segmented markets and supply chains make it difficult and costly for buyers and sellers to find each other and transact. This becomes a problem in the face of a shock, like COVID-19, when traditional markets lack the agility to respond to the supply and demand mismatches. Digital platforms can offer producers and consumers more options and connections, improve efficiencies through cost reductions, and promote transparency throughout the food logistics system. During the pandemic, agri-tech start-ups have provided significant services to farmers and supply chains. More broadly, countries with better digital ecosystems had fewer disruptions in food systems and were more resilient (Kim et al. 2020). By accelerating the move to digital technologies, COVID-19 physical lockdown measures have created an unexpected opportunity to usher in change in the sector. Now is the time for all-hands-on-deck engagement to improve food systems and move toward a more sustainable future going forward.

Evidence from high-frequency phone surveys tracking the socioeconomic impacts of the pandemic in Malawi, Uganda, and Ethiopia, for instance, shows that food security remains a significant challenge during the pandemic, particularly for the countries’ poorest. The agriculture sector has been affected by the pandemic in diverse ways. The sector seems to have grown, with families entering farming as a way to cope with the economic downturn. This change was particularly pronounced among households in the top 20 percent of the pre-pandemic per capita consumption distribution in Uganda. Additionally, 23 percent of farming households

\(^{76}\) This section draws from Torero (2020).
noted that the pandemic has changed their crop cultivation decisions, by increasing land under cultivation and the diversity of crops planted. Farmers who sell their produce (44 percent), however, reported difficulties in their ability to sell produce in the markets (41 percent of all produce-selling households) in Uganda.

The desert locust infestation in Ethiopia continues to impose significant damage to crops, leading to a deterioration of the food security situation and a threat to livelihoods. Additionally, heavy rains are causing ongoing flooding in several parts of Ethiopia, impacting nearly 600,000 people, with more than 220,000 people displaced to date. In Malawi, 88 percent of the businesses in urban areas in the service sector reported lower or no sales revenue, with a similarly widespread reported decrease in sales revenue in rural areas.

Although the global food price index remains stable, reflecting well supplied markets, food security risks persist at the local and national levels. For instance, Sudan has continued to register increasing food prices, with staple food prices five to six times above the five-year average. Lockdowns and social distancing measures impede countries’ functioning of land governance systems, preventing people from registering land and settling disputes. In Ethiopia, for example, land registration and land dispute resolution ceased after the government declared a state of emergency on April 8. As of June 26, no active mediation or litigation services were addressing land conflicts in Ethiopia, and most grassroots organizations were not operating. The closure of public land and public administration services also undercuts people’s access to information—especially in countries with non-digital land administration—which in turn undermines land transaction transparency and government accountability. Inclusiveness is an important element for building resilient food systems for the future.

There is a growing consensus that human, animal, and environmental health are indivisible conditions and that the pandemic presents an opportunity for governments to build back better toward such a holistic paradigm. Stressing the need for resilient value chains, policy makers should incentivize value chain investments that diversify the sources of risk. In response to the pandemic, most governments have prioritized the movement of food and agricultural products by exempting the sector from lockdown restrictions. Nevertheless, implementation shortcomings have restricted the smooth functioning of food supply chains in many places (Ethiopia, Ghana, the Democratic Republic of Congo, the Republic of Congo, Kenya, the Central African Republic, the Comoros, Liberia, Madagascar, and Guinea). Agricultural input markets (seed and fertilizers) have also been impacted, restricting access to critical inputs for planting the next crop (Ghana and Côte d’Ivoire) and imported inputs (Cameroon, Ethiopia, Kenya, Liberia, Malawi, Nigeria, Guinea, Uganda, Tanzania, Zambia, and Zimbabwe).

Food systems, which directly employ more than one billion people, are also at risk of losing jobs in food processing, services, and distribution, disproportionately affecting female workers. Food supply chains must keep moving. Health is a precondition for economic recovery, and food is a precondition for health. Building output and input supply chain resilience and urban and rural planning to improve local food production and distribution are critical elements for increasing long-term productivity as well.

77 A catastrophic locust outbreak is projected to force 25 million people in Ethiopia, Kenya, Somalia, Uganda, and Sudan to go hungry. A swarm covering one square kilometer contains 80 million insects and consumes more food in 24 hours than 35,000 people.
Governments urgently need to use cash transfers and mobilize food banks. Parallel to this, they should increase food production, reduce food losses, and create employment. Public works projects throughout agri-food systems can provide people with livelihoods. It is important that the rural poor, especially women among them, benefit from this policy combination. It is equally critical that smallholder farmers and micro, small, and medium-size enterprises keep operating. In poorer countries, they play a crucial role in supplying food to poor consumers.

For Africa, intraregional trade is especially important, because the countries in the region can create demand to compensate the weak demand from Europe. African countries should develop food safety standards across the value chain and ramp up access to infrastructure. The first is vital, as it would reduce NTBs and prevent governments from imposing blanket import restrictions. COVID-19 has amplified the voices of anti-globalization. It is setting off calls for food self-sufficiency as well. This is understandable, but no country has all the natural resources to produce the food it needs in the variety it needs. Facilitating global trade, not promoting self-sufficiency, is key to boosting food security. The pandemic has also given us an opportunity to make investments that will lay the foundation to reset food systems and whose returns will accrue far into the future.

**Africa’s Sluggish Spatial Transformation**

Sub-Saharan Africa’s urban population doubled during the past 20 years, reaching 450 million in 2019. Despite its high urban growth, the region is experiencing low urbanization of people and sluggish spatial transformation of its economies. The share of the urban population rose from 31 percent in 2000 to 41 percent in 2019, but much of that population growth was a natural effect of fertility rather than an economic effect involving migration. Although rural-to-urban migration has occurred for decades, the rapid increase in Africa’s urban population in recent years is largely attributed to natural growth; rural-to-urban migration is estimated to contribute less than 40 percent (Jedwab, Christiansen, and Gindelsy 2017).

Urbanization has traditionally been strongly correlated with the expansion of jobs and economic activity in the more productive industrial and service sectors —thus, boosting per capita income growth. Figure 3.20 shows the case for Asia’s transformation. From Japan to the Asian Tigers, there was a clear strategy of concentrated economic development in urban concentrations. Economic activities located in these cities were as connected with the rest of the world as with their hinterlands, if not more. Following the success of the Tigers, in the 1980s the Cubs (Thailand, Indonesia and Malaysia) concentrated economic activity in the metropolitan cities of Bangkok, Jakarta and Kuala Lumpur. As in Japan, export-oriented economic activity concentrated in large urban areas; economic and spatial transformation went hand in hand. For most countries, manufacturing as a share of GDP rises with the urban share until about 60 percent of the population lives in cities and manufacturing accounts for about 15 percent of GDP (Lall, Henderson, and Venables 2017).
Most Sub-Saharan African countries, however, have not seen large reallocation of economic activity away from the agriculture sector, contributing to urbanization without growth (figure 3.21). In general, most of Sub-Saharan Africa has not developed a manufacturing sector beyond the production of traditional goods for within-country consumption (Henderson and Turner 2020). A particularly striking feature of the region’s spatial development is that urban incomes are significantly higher than rural incomes even in the absence of significant spatial economic transformation. Poverty is substantially lower in urban than in rural areas and, although poverty is falling in the region overall, it is declining fastest in large cities (Nakamura, Paliwal, and Yoshida 2018).

Urban incomes are higher than rural incomes in Sub-Saharan Africa even in the absence of significant spatial economic transformation.

Note: Asia 1 = the Republic of Korea Singapore (Tigers); Asia 2 = Indonesia (Cub); Asia 3 = China, India, and Vietnam (today’s rapid urbanizers); Asia 4 = Afghanistan, Bangladesh, Bhutan, the Islamic Republic of Iran, Jordan, Maldives, Mongolia, Nepal, Pakistan, Papua New Guinea, the Philippines, Saudi Arabia, the Syrian Arab Republic, Thailand, and the United Arab Emirates.

FIGURE 3.20: Urbanization and Economic Transformation Have Gone Hand in Hand in Asia

Urbanization in Asia has come along with an expansion of jobs and economic activity in more productive industrial and service sectors.

FIGURE 3.21: Urbanization Has Been Associated with Uniform Growth in East Asia, but the Story Is a Mixed Bag for Sub-Saharan Africa

Change in share of manufacturing and services in GDP During the period of rapid urbanization

Source: Calculations based on World Development Indicators.
Note: The data correspond to changes between 1990 and 2016.
Higher urban incomes alongside weak structural transformation can largely be attributed to extremely low rural productivity and service provision rather than the economic benefits of urban density. Lall et al. (2017) show that compared with other developing cities, African cities produce few goods and services for trade on regional and international markets. Unlike nontradables, tradable goods and services face elastic global demand. They may also allow for agglomeration economies, which increase returns to employment (box 3.5). Rapidly growing cities require growth in employment—and the returns to expanding employment are highest in tradable sectors.

What is an urban agglomeration economy, and how does it arise from economic density? A simple case is the reduction of transport costs for goods: when suppliers are close to their customers, shipping costs decline. In the late 19th century, 80 percent of Chicago’s jobs were compactly located within four miles of State and Madison Streets—near residences and infrastructure (Grover and Lall 2019). And in the early 1900s, New York and London were manufacturing powerhouses because factories were built there to access customers and transport services. Many agglomeration benefits increase with scale: each doubling of city size increases productivity by 5 percent, and the elasticity of income with respect to city population is between 3 and 8 percent (Rosenthal and Strange 2004).

Productivity gains are closely linked to urbanization through their ties to structural transformation and industrialization. As countries urbanize, workers move from rural to urban areas in search of better paid and more productive jobs. Similarly, entrepreneurs locate their firms in cities where agglomeration economies will increase their productivity. Close spatial proximity has many benefits. Certain public goods—like infrastructure and basic services—are cheaper to provide when populations are large and densely packed together. Firms located near each other can share suppliers, lowering input costs. Thick labor markets reduce search costs, giving firms a larger pool of workers from which to choose. And spatial proximity makes it easier for workers to share information and learn from each other. International evidence shows that knowledge spillovers play a key role in boosting the productivity of successful cities.

Evidence from East Asia (China, the Republic of Korea, and Vietnam) points clearly to a close association between episodes of rapid urbanization and economic development. Unfortunately, these links appear weak in Sub-Saharan Africa. Cities in Africa are not delivering agglomeration economies or reaping urban productivity benefits; instead, they suffer from high costs for food, housing, and transport. These high costs—rising from coordination failures, poorly designed policies, weak property rights, and other factors that lower economic density—lock firms into producing nontradable goods and services.

Agricultural productivity in the region is low by global standards, reflecting low irrigation rates, low input usage, and limited upgrading to new seed technologies compared with other regions (Fuglie et al 2020; Goyal and Nash 2017; Ray et al. 2012). Cereal yields in Sub-Saharan Africa are half those in South Asia, which in turn are half those in high-income countries, and well below those in East Asia and Latin America. Similarly, Sub-Saharan Africa consistently lags behind other regions in agricultural TFP growth (Goyal and Nash 2017). Low rural productivity can help in explaining why urban incomes are comparatively so much higher than rural incomes in the region (Henderson, Kriticos, and Nigmatulina 2019). Access to services is also better in urban areas: moving from a rural area to an urban one is associated with a differential of improved access to water, sanitation, and electricity of about 45, 35, and 50 percent, respectively (Hommann and Lall 2019).
A puzzling feature of Sub-Saharan Africa’s spatial landscape is the nature of its jobs. Around 25 percent of the urban population in the region—and about 30 percent in Mozambique, Sierra Leone, and Tanzania—is still employed in agriculture as the main occupation. In contrast, in Brazil, India, and Malaysia, shares of urban farmers are all under 7.5 percent (Henderson and Kriticos 2017; Henderson and Turner 2020). In Sub-Saharan African countries this share has been rising rather than falling (Hommann and Lall 2019). Figure 3.22 shows that in these Sub-Saharan African countries, almost 90 percent of rural sector employment is in farming. This is far higher than what is seen in other countries, where rural services, construction, and even manufacturing employment are more important. Finally, it is important to consider the particularly small manufacturing share in smaller cities and towns.

**FIGURE 3.22: High Share of Urban Farmers in Sub-Saharan Africa**

Almost 90 percent of rural sector employment in Sub-Saharan Africa is in farming.

- **Farmers in African Cities by City Size**
- **Percentage of workers reporting manufacturing as main industry**
- **Percentage of workers reporting agriculture as main industry**

Source: Henderson and Kriticos 2018, figure 3 and supplemental figure 2.

Note: Data from Integrated Public Use Microdata Series for the most recent census for Ethiopia, Tanzania, Mozambique, Ghana, Cameroon, Mali, Malawi, Zambia, Sierra Leone, Liberia, and Botswana. Small cities are in the bottom 50 percent of cities by size and tertiary cities are in the 50th-75th percentiles. Cities are defined by night-light boundaries to which population is assigned.

**Need to Identify Nonfarm Job Opportunities in Small Towns**

Residents of smaller towns are disproportionately employed in agriculture. Although the agricultural share of employment remains significant across all urban areas, it becomes even larger for the lower hierarchy of urban systems. It is likely that any manufacturing in these places is traditional food processing, non-metallic minerals, locally made furniture, weaving, and the like for local consumption (Henderson and Turner 2020). The economic scope of towns remains local.

Small towns are important in Africa’s urbanization narrative as they dominate the urban landscape. Smaller cities and towns with fewer than 250,000 people account for about half of the urban population (figure 3.23). Among this group, small towns with fewer than 50,000 people account for almost one-third. Their failure to diversify limits job creation and dampens livability across the spatial continuum.
For small towns, a critical issue is to identify and support economic opportunities that offer employment to the growing population outside farming. Developing rural–urban linkages is part of a coherent strategy: towns could be places that bridge rural and urban economies. The obvious place to start is to consider existing agricultural value chains and how much value added could be stimulated to generate off-farm employment in agroprocessing or other agriculture-related activities (box 3.6). Less clear is why this approach has not happened at scale, given Africa’s agricultural potential.

Agroprocessing and horticulture, like manufacturing, benefit from agglomeration economies. Governments can support agglomerations by concentrating investments in high-quality institutions and infrastructure aimed at improving agricultural productivity and agroprocessing value chains. Opportunities for the agribusiness industry suggest that targeted investment in processing, logistics, market infrastructure, and retail networks could help support the development and expansion of commercial value chains throughout the region.

Today, agro-industry in Sub-Saharan Africa mostly misses scale and thus cannot weather risks easily, nor can it unleash innovation and orientation toward global markets. Agroprocessing industries equally lack scale. About 75 percent of agroprocessing in Sub-Saharan Africa (except in South Africa) is by micro or small enterprises that cater to low-income households within the towns or neighborhoods. Entrepreneurs of that size cannot take advantage of innovation to enhance productivity and resilience, and they cannot connect to markets beyond their towns, let alone beyond country borders.
Assessing Options for Developing Midsize Cities

Secondary cities, the middle class of cities, are largely absent from Africa’s urban landscape or, if they are present, they are stagnating without an industrial role. Africa clearly deviates from world trends by having most of its urban population living in small towns or large cities of more than one million people. This implies a considerable lack of secondary city development—cities that many consider to be better facilitators of labor mobility, job creation, and the transition from rural to nonrural activities. Secondary cities are growing much more slowly than the bottom 50 percent of urban settlements by size. Although secondary cities thrive in many parts of the developing world as they receive industry decentralized from the metropolitan giants, Sub-Saharan African countries have so little industry that secondary cities have a small role at this time.

Although targeted development of secondary cities is seen by many of the region’s governments and policy advisors as being key to economic growth in the region (see, for example, Christiaensen and Kanbur 2016), recent research questions the efficacy of this approach. A global analysis on the distribution of economic activity within countries shows that the spatial development patterns unfolding in low- and middle-income countries are unlikely to follow the same pattern observed in today’s advanced countries that urbanized earlier (Henderson et al. 2018). In today’s advanced countries, the process of agglomeration and structural transformation began early, when transport costs were still relatively high, so urban agglomerations arose in multiple agricultural regions. High costs of trade protected local markets. In later developing countries, transport costs had fallen well before structural transformation started. To reap urban scale economies, economic activity tended to agglomerate in relatively few, often coastal, locations. With structural transformation, these initial coastal locations grew, while cities formed more rarely in the agricultural interior.

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**BOX 3.6 Continued**

South Africa is an illuminating exception. Although the country has more than 7,000 agroprocessing firms with their own commodity value chains, the sector is dominated by a few large, diversified firms. A key characteristic of agroprocessing in South Africa is its strong upstream and downstream links. Upstream, the sector links to primary agriculture across a variety of farming models and products. Downstream, agroprocessing outputs are intermediate products (to which further value is added) and final goods (marketed through wholesale and retail chains as well as a diverse array of restaurants, pubs, bars, and fast food franchise outlets).

For the most part, Sub-Saharan Africa currently relies on commodity trading rather than adding value to its commodities, which could bring more prosperous economic development. Africa’s commitment to smallholder agriculture needs alternatives to advance the commercialization of production and bring in more reliable inputs.

Source: ACET 2017.
A key takeaway is that agricultural fundamentals drove the location of economic activity in advanced countries, while cost-of-trade fundamentals play a much bigger role in developing countries (Henderson et al 2018). Africa’s domestic transport costs may be considered to be very high. Atkins and Donaldson (2015) show that the costs of intranational trade are approximately four to five times larger in Ethiopia and Nigeria than in the United States. Teravaninthorn and Raballand (2009) conduct a survey of truckers and also find that transport costs in Africa today are higher than in developed countries such as France and the United States by a factor of two or three. These high costs, particularly for places far from a major port, can dampen the extent of intra-national trade and limit the growth of secondary cities.

However, comparing recent domestic transport costs between developing and advanced countries is likely to be misleading. In fact, Given the major decline in transports costs in advanced countries and regions over the past 150 years, transport costs in Africa are far lower than they were in developed countries during their periods of rapid agglomeration (Henderson et al 2017). Inland areas of Africa are connected to world markets at costs that are low by historical standards. Thus, Africa’s urbanization is taking place in a relatively low transport cost environment in comparison with early developers. In applying their model, Henderson et al (2017) simulate that interior areas of the region, such as the Congo Basin and the Ethiopian Highlands, would have had higher economic concentration if they were “early developers” than under the later development situations (which is what applied to them). Similarly, areas around navigable rivers, particularly the Nile and Niger, have higher predicted economic concentration under late development than if the region had developed early.

At the other end of the spectrum, Africa’s large cities have not broken into the markets of tradable industrial sectors benefiting from localization economies. Countries such as China have been witnessing suburbanization of standardized industry out of large metropolitan cores, with investments in rail and road networks. With better transportation, businesses chose to leave high-priced urban cores and move to suburban locations. However, the engine for such transformation has not yet fired in most of Sub-Saharan Africa. It is plausible that digital technologies could reduce information and other transaction costs, making the development of medium-size cities less challenging. However, these would need to supported investments in digital infrastructure are needed to improve access of sparsely populated areas.
by (1) major investments in digital infrastructure to improve access to sparsely populated areas (figure 3.24), (2) complementary investments in human capital to enhance the returns from digital development, and (3) coordinated investments in urban infrastructure to support city development.

**Supporting Large Cities Break into Tradable Sectors by Supporting Dense and Connected Development**

Large cities of more than one million people account for 34 percent of Sub-Saharan Africa’s urban population. However, in contrast with the economically dense and connected urban forms that are visible in many middle-income cities, Africa’s large cities are growing under a patchwork of constraints that hinder the drive toward dense concentrations of structures.

Using satellite and geographic information system data covering large cities across the region, the evidence suggests that cities in Africa today cannot be characterized as being economically dense, connected, and livable (Lall et al. 2017). Instead, they are crowded, disconnected, and therefore costly for households and firms. These high costs—related to their urban form—are keeping cities from growing their economies. Specifically, Africa’s cities are crowded and not economically dense. Investments in infrastructure and industrial and commercial structures have not kept pace with the concentration of people, nor have investments in affordable formal housing.

Cities are disconnected as they have developed in small and fragmented neighborhoods, which lack reliable transportation and limit workers’ job opportunities while preventing firms from reaping scale and agglomeration benefits. For example, heavy congestion, high rates of walking, informal collective transportation, and the spatial distribution of jobs and residents lead to low employment accessibility in Nairobi and the misallocation of labor (Avner and Lall 2016). Matatu (privately owned minibuses) users on average can access only 4 percent of jobs within 30 minutes, 10 percent within 45 minutes, and 20 percent within 60 minutes. These figures are very low: in metropolitan Buenos Aires, the equivalent accessibility figures using public transportation are 7, 18, and 34 percent for the same time thresholds (Peralta Quiros 2015). In Ugandan cities, 70 percent of work trips are on foot (Uganda Bureau of Statistics 2010), with the average share of jobs reachable within one hour standing at just 19 percent (Bernard 2016).79

Cities in Sub-Saharan Africa fail to realize their potential gains from agglomeration and economic density, and they cannot efficiently match employers and job seekers through connections. Such inefficiency stymies agglomeration economies, keeping costs high and closing the doors of African cities to regional and global trade and investment. Cities are also costly, as there are few investments in structures imposing high living costs on workers and households, resulting in indirect costs and other constraints for firms: it is costly to live and do business in African cities.80

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79 Conversely, car accessibility is very high in the United States—very few metropolitan areas have less than 100 percent average accessibility to employment within an hour (Levinson 2013)—and public transit accessibility is much lower. The city in the United States with the highest average employment accessibility via public transit is Salt Lake City, with only 25.4 percent of jobs reachable within 60 minutes (Owen and Levinson 2014). In many cities the average is far less: only 2.2 percent of jobs in Riverside, California and 2.8 percent in Atlanta, Georgia are accessible by public transit within 60 minutes. These numbers reflect the shaping of U.S. cities by cars and roads, which decentralize people and jobs. In such contexts, efforts to connect workers and firms through transit are unlikely to succeed.

80 A 1 per cent reduction in spatial fragmentation measured is associated with a 12 per cent reduction in urban costs, controlling for income levels and city population (Lall et al. 2017).
For African cities to grow economically as they have grown in size, public policy and investment need to support *scale* and *specialization*, which would raise the level and sustain the growth of productivity. The urbanization process and urban areas are being hobbled by a myriad of constraints. Thus, the following priority areas for policy and investment merit consideration. These priorities are cognizant of the fact that urbanization is not a linear process; as countries in Sub-Saharan Africa reach middle incomes, their pace of urbanization (not urban growth) will accelerate and many countries will be two-thirds urbanized in a matter of decades. If economic development stagnates, urbanization is likely to stagnate as well. The priority is to create the enabling conditions for urbanization to accommodate and stimulate jobs and economic transformation.

**Clarifying and Securing Land and Property Rights**

Strengthening land rights is a precondition for the emergence of a formal land market. Informal, nonlegal markets can function in any condition, but informality in land markets is distinctively limiting because—unlike most informal businesses—land is an asset. Asset transactions are viable only if the purchaser can rely on some enduring, extralegal means whereby new ownership is recognized, such as sanction by the local community. In contrast, a formal market does not merely offer purchasers with the protection of the state; rather, because transactions are readily observable and recorded, it generates the public good of accurate valuation. African cities struggle with overlapping and sometimes contradictory property rights systems—formal, customary, and informal. Under the customary rules for land tenure that control much of the peri-urban and urban land in Africa, property rights depend on the consent of local chiefs or family elders. One example is Durban, South Africa (see the online appendix). Other examples are in Ghana, Lesotho, Mozambique, and Zambia.

When barriers to urban land access arise from an overly complex property rights regime, they impede the consolidation of plots and the transfer of land among users—and among uses. Firms cannot readily buy land to convert it from low-density residential use into higher-density apartments, or to build clusters of new commercial structures. Land transactions are long, costly, and complicated. Such market constraints reduce the collateral value of structures, giving developers little incentive to invest in residential height—while tempting all parties to enter informal arrangements (Lall et al. 2017).

Unclear land rights are severely constraining urban and rural land redevelopment throughout Africa, imposing high costs for businesses. Even where formal titles or clear land rights exist, basic mapping, geographic, or ownership information is often inaccurate or land records are poorly maintained, causing disputes. Applying for formal recognition can also be a tedious process. In Mozambique, an application for land plot concession from the relevant municipal directorate or municipal cadaster services involves as many as 103 administrative steps and may be protracted over several years (UN-Habitat 2008). The lack of a proper registration system prevents urban land markets from functioning well and creates obstacles to raising capital for development and investment—and to the local authority raising of revenue.
Across Africa, land databases and other systems to record information are inadequate and opaque. An African city is likely to struggle with overlapping systems of land tenure—formal, customary, and informal—in a single urban space, where they often conflict with each other and constrain land markets by creating confusion and disputes over land rights. These disfunctions distort the price and availability of land for efficient urban development. Finally, land administration systems (such as registries and cadaster records) are incomplete and underused for enforcing legal claims and landholders’ fiscal obligations, so lenders cannot always use land as collateral. In Sub-Saharan Africa, only 10 percent of total land is registered (UN-Habitat forthcoming). In West Africa, only 2–3 percent of land is held with a government-registered title (Toulmin 2005).

**Strengthening Urban Planning and Land Use Regulation**

To get land development at scale, there is need for effective coordination among different plans to ensure the effectiveness of planning and the efficiency of investments. Coordination and alignment are needed vertically across different layers of plans—including *upstream* (aligning local development initiatives with regional and national priorities, under available budgets and resources) and *downstream* (trickling down from macrolevel strategic plans to local, detailed plans and leading to capital investment plans)—and horizontally across different sectors, especially between land use plans and infrastructure (particularly transport) investment plans. Such coordination requires constant engagement with economic, social, environment, and infrastructure agencies, as well as service providers, a key function of urban and regional planning.

The quality and appropriateness of planning instruments depend heavily on access to accurate information. Without such information, city leaders will be unable to plan for the future or take coordinated actions across institutions. Spearheading disruptive technologies can help largely on data collection and analysis, fostering evidence-based policy making, better governance, and efficiency. For example, in Nigeria, Sierra Leone, and Somalia, remote sensing technology has been used to estimate losses and damages in difficult-to-access places. In Kampala and Addis Ababa, satellite imagery has been used to monitor changes in land use patterns and identify vacant or underused land.

Investment planning will differ for larger cities and smaller towns because they often require different sets of investments. Large Sub-Saharan African cities need to scale up investments in infrastructure to contend with existing infrastructure and settlements. Because of higher density, some infrastructure solutions that are acceptable in low-density environments may not be sufficient in larger cities, often requiring more capital-intensive collective solutions. Smaller towns, in contrast, need support for extending access to basic infrastructure services, which can be delivered either through the subnational system (where such system performs reasonably) or direct investments.
Scaling Up Infrastructure Investments, Making Them Sustainably Financed and More Efficient

Even if Sub-Saharan African countries can strengthen planning and regulatory institutions for better coordination of their urban infrastructure investments, how will they finance these investments? This question has no easy answer. Local government revenues in Sub-Saharan Africa are generally low—with limited own-source revenues and modest amounts from intergovernmental transfers. Central government coffers are depleted, and local infrastructure is already financed through the government transfer system. Foreign aid is limited and often uncoordinated, and the private sector is risk averse in the face of political instability and low returns.

Average annual infrastructure spending of Sub-Saharan African countries was equal to 2 percent of GDP between 2009 and 2015. This amount was lower than annual infrastructure spending in China (8.8 percent of GDP in 2008-13), South Africa (4.7 percent), and the United Kingdom (2.2 percent), to mention a few examples.81 Two-thirds of spending by Sub-Sahara African countries was on roads; electricity and water supply and sanitation each accounted for one-sixth. Such public spending levels for infrastructure are far too low to address the region’s deficit (World Bank 2017a).

Increase the sources of local government revenue. Only a handful of large cities with rich tax bases have substantial own-source revenues, and these are often related to having regional government status. Examples include Addis Ababa, Ethiopia, with US$124 in per capita revenue for fiscal year 2011/12; Nairobi county, Kenya (US$118 per capita for fiscal year 2015/16); and Kampala, Uganda (US$59 per capita for fiscal year 2013/14). In contrast, the average local government had much lower revenue in Uganda (average US$26 per capita, excluding Kampala); Ghana (average US$14 per capita for 2015, including rural district governments); and Côte d’Ivoire (US$6 per capita for 2013).

Property tax administration in Sub-Saharan Africa is extremely poor, with astonishingly low yields—for example, urban councils in Uganda received only US$6 per capita for Kampala and an average of US$4 per capita for other municipalities, and average annual receipt in Tanzania were as low as US$0.38 per capita. The low yields are attributed to caps on property tax rates imposed by the central government, weak tax administration, and political resistance. Many local governments also lack the institutional capacity to perform the critical functions of tax administration—recording, valuation, and collection—so the process fails at every stage.

Given the low property tax revenues, most Sub-Saharan African countries permit local governments to impose further taxes on business activity—although most are not explicitly called “taxes”—and these account for a larger share of local urban revenues than property taxes. For example, Tanzania allows local governments to impose a “service levy” on registered businesses at a rate of 0.3 percent of their turnover net of value-added tax. Other countries impose annual “license fees” on various business categories.82 With local tax revenues being low, intergovernmental transfers account for most of the urban local government revenues—as

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82 In addition to property taxes and “business taxes,” a few countries such as Uganda also attempt to tax income, but these revenues are low; similarly, utility service charges may be assessed but they are typically too low to cover operating costs.
much as 80–90 percent, including shared taxes (those collected by the central government but returned at least partly to the originating jurisdictions).

Looking farther ahead, Sub-Saharan African countries will need to increase the domestic revenue available to local governments—but the challenges are daunting. The predominance of the informal economy in African cities makes it difficult to tax local businesses or personal income on a significant scale. And the sorry state of property tax administration—combined with the political obstacles to imposing property taxes at significant rates—suggests that it will take time to increase yields from this source. It may also call for a review of employing more land-related taxation (as opposed to property taxation) to simplify the burden of valuation and as a tool to incentivize better land use in prime urban areas.

**Strengthen land valuation.** Land pricing on the market partly depends on policies, which must be designed with great care. Taxes, charges, and subsidies can be used to complement regulatory controls on land use, creating financial incentives and disincentives. Revenues—such as those from land-based financing—can also be used to finance administrative costs and infrastructure. Implementation tools, such as capital investment, budget, and phasing plans, can help with upstream planning.

Most cities in Sub-Saharan Africa lack the capacity to raise revenues from land: laws prohibit, or severely limit land fees and taxes (World Bank 2015b). Even with different laws in place, cities would have little power to leverage land for revenue, as fiscal cadaster records and capacities are weak. And cities’ reliance on central government transfers means that they have few incentives to make such efforts. Given the inadequacy of revenues from intergovernmental transfers, Africa’s cities should consider land and property taxes to finance urban infrastructure and public services.

**Crowd in private sector finance.** In principle, local governments could finance investments through municipal public-private partnerships (PPPs). In Tanzania, for example, several urban local governments have agreements with private investors to provide bus terminals, municipal markets, shopping centers, and hotel and conference centers. The private partners assumed responsibility for building and operating the facilities. In some instances, local governments contributed to the construction cost or provided the land. The agreements establish the share of revenues, standards for maintenance and operations of the facilities, and penalties for not meeting the terms and conditions of the agreement. To crowd in larger infrastructure investments, more innovative fund and deal structures need to be offered to mitigate risk. These structures could include guarantees and other risk-sharing designs, or blended finance instruments that can leverage private sector funding for infrastructure development.

**Tap central government resources and foreign aid.** In the short term, central governments could spend more —directly by investing in infrastructure projects and indirectly by scaling up transfers. Central governments have an overwhelming comparative advantage in mobilizing resources —in part because they are the negotiators of foreign assistance, an important source of funding for most Sub-Saharan African countries, with the share of the overall capital budget

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83 In generic terms, a municipal PPP is a contract between a municipality and a private party in which the private party assumes substantial financial, technical, and operational risk in the design, financing, building, and operation of a service.
allocations funded through foreign aid registering 36 percent in 2015 (World Bank 2017a). Most central governments also monopolize the main tax instruments, so local governments should not appropriate these instruments.

Foreign aid in support of transfers through government systems may support better coordination of investments at the local level and increase accountability and ownership. With major infrastructure projects being mostly undertaken directly by central government ministries or parastatals, the result often triggers poor coordination and lack of institutional coherence with local government efforts. Countries have experimented with different types of transfers for capital investment financed by foreign aid: a move supported by the World Bank in more than a dozen countries, with mixed results. Such interventions often bring important opportunities to reform the procedures for distributing these transfers, reducing the role of political considerations and making the allocation more objective and transparent.

Raise investment efficiency. Strong infrastructure governance plays an important role in boosting the output multiplier of infrastructure investment in developing countries. The positive growth and private investment impacts of increases in public investment are larger in countries with stronger infrastructure governance. In contrast, output and private investment decreases while public debt increases, in response to increased public investment in countries with weaker governance, possibly suggesting problems with project selection and costing, and with the crowding out of private investment (Schwartz et al. 2020).

Scaling up infrastructure investment requires better public financial management capacity, including countries’ capacity to select and appraise projects on the basis of economic returns analyses and to monitor their implementation to minimize leakages. It also entails the inclusion of operation and management expenditure for existing and future infrastructure to ensure that such expenditure systems are sufficiently budgeted and avoid the early decay of built infrastructure (World Bank 2017a). In addition to enhancing the infrastructure governance managing large-scale infrastructure, the allocative efficiency of central government transfers must be reconsidered. Among these transfers, the most urgent need is to reform the unconditional transfers that fail to meet any efficiency criteria. Such a reform would include four steps: first, make the total amount of central government transfers more predictable—for example, by fixing them as a percentage of total central government revenues (or GDP); second, make the criteria for distributing unconditional transfers among individual jurisdictions more transparent; third, give less weight to variables in transfer formulas that are biased against cities; and fourth, ensure that transfers are distributed according to their enabling legislation.