

05

**TECHNOLOGICAL
INNOVATIONS:
CREATING AND
HARNESSING
TOOLS FOR
IMPROVED
LIVELIHOODS**

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Harnessing technology and innovation for a better future in Africa: Policy priorities for enabling the 'Africa we want'

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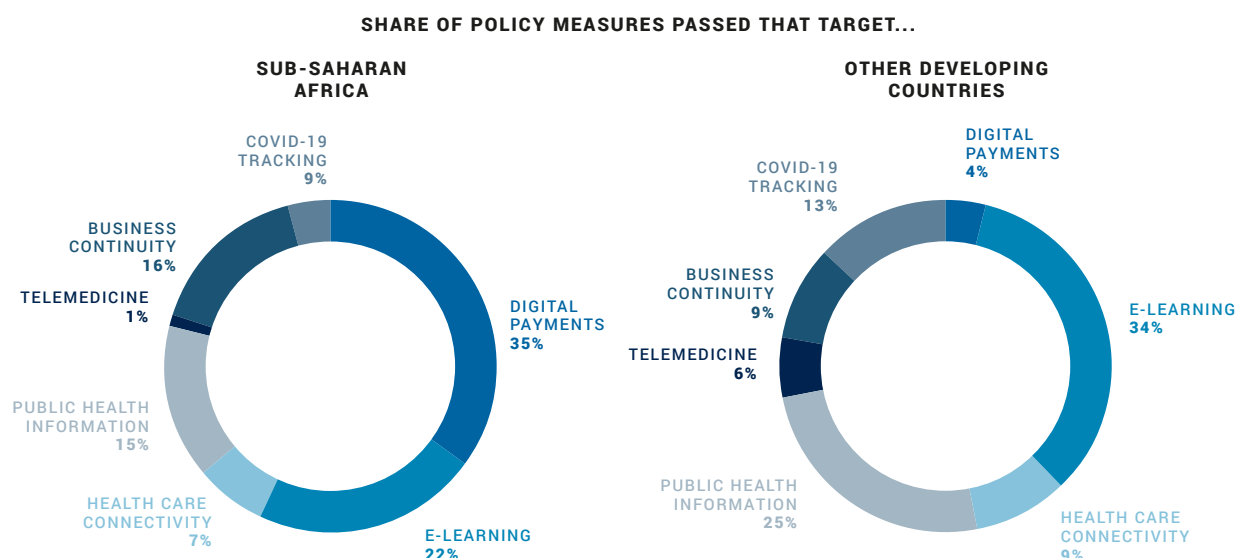
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The COVID-19 crisis has changed how the world functions, bringing to light many limitations of existing systems and showing the need to reimagine the role of informational technology as a tool for economic growth. Indeed, the pandemic has accelerated the velocity and effectiveness of technology innovation, adoption, policy, and regulation. Although Sub-Saharan Africa's has benefited from the acceleration of technological uptake across sectors, such as health care or economic transformation, the region still grapples with gaps in critical areas, including in human capacity and infrastructure.

Importantly, the unique global policy momentum that has led to unlocking barriers to technology and innovation during the pandemic provides further evidence that governments can play a key policy role not only in enabling technological innovation, but in supporting its diverse uptake and use. In fact, during the pandemic, African governments looked to enact policies specifically to boost technological innovation and uptake (Figure 5.2).

FIGURE 5.1. GOVERNMENT SERVICES SHIFTED TO THE DIGITAL SPACE IN REPOSE TO COVID-19

The COVID-19 pandemic forced many governments to shift their services to the digital space. As shown in the figure below, African government responses differed largely from other developing regions, particularly with digital payments. In both cases, e-learning also expanded.



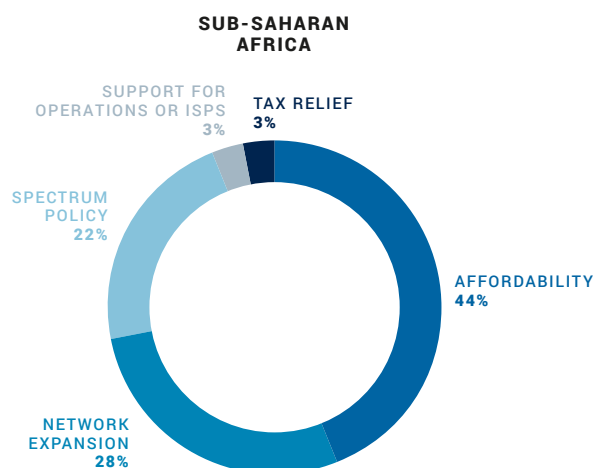
NOTE: According to the World Bank, this database is non-exhaustive, based on measures reported in news and specialized publications. The figures reported use information from the database accessed on February 15. Sub-Saharan Africa includes Angola, Benin, Botswana, Burkina Faso, Cabo Verde, Cameroon, the Central African Republic, the Democratic Republic of Congo, Côte d'Ivoire, Ethiopia, Ghana, Guinea, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritius, Mozambique, Namibia, Niger, Nigeria, Rwanda, Somalia, South Africa, Sudan, Tanzania, The Gambia, Togo, Uganda, Zambia, and Zimbabwe. Developing countries outside the region comprise 46 countries in East Asia and the Pacific (9), Europe and Central Asia (9), Latin America and the Caribbean (12), the Middle East and North Africa (11), and South Asia (5).

SOURCE: "Covid-19 And The Future Of Work In Africa: Emerging Trends In Digital Technology Adoption." World Bank, 2021.

FIGURE 5.2. SUB-SAHARAN AFRICA'S POLICIES TO BOOST DIGITAL INFRASTRUCTURE IN RESPONSE TO COVID-19

Throughout the pandemic, sub-Saharan African governments enacted a number of policies to both support citizen livelihoods and boost the economic recovery. As part of this effort, in response to COVID-19, governments in sub-Saharan African countries enacted 60 digital infrastructure measures aimed at boosting technological innovation, with the majority focused on increasing access to digital tools.

SHARE OF POLICY MEASURES PASSED THAT TARGET...



NOTE: The figure represents 129 COVID-19 policy measures in selected sub-Saharan African countries.

SOURCE: "Covid-19 And The Future Of Work In Africa: Emerging Trends In Digital Technology Adoption." World Bank, 2021.

POLICY RECOMMENDATIONS

To make the most of technology and innovation, African governments must exploit the momentum of innovations already occurring across the continent and remove the barriers to growth and development that remain. I posit seven priorities for policymakers looking to enable and harness the future of technology for a prosperous continent.

* Invest directly in information and communications technology (ICT) and infrastructure development.

Internet expansion will be key to long-term innovation and adoption of more advanced technology, from the Internet of Things to artificial intelligence and beyond. While the ICT and mobile sectors have grown in recent years, millions in Africa still lack connectivity. Gaps in internet access prevent citizens from accessing the full scope of internet services; slow economic growth; limit Africa's potential to trade and interact with the world; and lead to inaccurate, biased data collection. If African countries want to advance technologies like electricity and broadband, they must first have better access to physical and digital infrastructure.

Moreover, policymakers must not overlook traditional infrastructure, as it is necessary for African countries to attract greater amounts of venture capital and investment. The completion of major energy and transportation projects—such as the Grand Ethiopian Renaissance Dam, the North-South Rail and Road Corridor in Southern Africa, and South Africa's Jasper Solar Farm—will be a key step signaling Africa's modernization to firms and investors from around the globe.

Collectively through multi-stakeholder partnerships, African countries must rapidly harness inclusive and sustainable digitalization to help build more equitable societies. African countries can do so by seeking to improve their infrastructure and make faster progress by courting regional and international partners rather than by working alone. African countries can learn from Morocco, whose robust infrastructure development has succeeded, in part, by incorporating multiple public and private sector partners under regional initiatives: For example, the country's high-speed rail project was built by

The unique global policy momentum that has led to unlocking barriers to technology and innovation during the pandemic provides further evidence that governments can play a key policy role not only in enabling technological innovation, but in supporting its diverse uptake and use.

Productive, inclusive growth in the context of automation requires that technology complements, not substitutes, workers.

French engineering company Alstom and received joint funding from France, Kuwait, Saudi Arabia, and Abu Dhabi.¹

✱ **Modernize and expand access to education, learning, and skills.**

Productive, inclusive growth in the context of automation requires that technology complements, not substitutes, workers. However, to do so, those workers and entrepreneurs must be equipped with diverse, relevant skills for the rapidly changing global economy. The literacy of Africa's workforce should be increased in a range of soft and hard skills to be flexible and dynamic: Public and private institutions should partner with universities to develop effective continuing and executive education programs. Digital literacy skills can be enhanced by the development of future-ready curricula that creates a culture that encourages lifelong learning. African states should also create or accelerate the development of engineering and business schools as well as technical vocational colleges to support industrial growth and create models of training based on the changing needs of the private sector. Additionally, African countries should integrate emerging technologies into education more systematically to improve learning outcomes through adaptive and collaborative learning platforms, distance learning, increased availability of learning materials, and dissemination of advanced pedagogies.

✱ **Increase the capacity of research institutions to participate in research and development activities and protect intellectual property.**

Research and development (R&D) investments, including in the public and private sector and universities, have positive effects on economic growth by encouraging the development of new knowledge, techniques, and technologies that improve productivity.² Currently, South America and Africa combined are responsible for less than 5 percent of the total global R&D spent, despite having more than 20 percent of the world's population.³ Indeed, Africa itself falls short of the 1.7 percent R&D global average, with many African countries only investing 0.42 percent of their total GDP.⁴ To improve participation in R&D, governments can provide incentives to research organizations (such as by allowing companies to commercially exploit technology developments arising from government-funded research); build pools of researchers and innovators by providing scholarships and investing in human capital and education; increase the capacity of research institutions to undertake quality research by providing funding; and encourage diaspora scientists, engineers, and innovators to return. (For more on strategies for boosting African health R&D capacity, see page 44.) Governments should protect intellectual property (IP) rights to stimulate the generation of new innovations and technologies. Such interventions can take the form of patents, copyrights, design rights, trademarks, and similar policies for protecting trade secrets.⁵

✱ **Steer investment toward high-productivity and labor-intensive industries.**

In the context of accelerated technology and innovation developments, countries need to take proactive measures to identify and exploit comparative advantages in the new industrial niches presented by the latest technology. Prioritizing the growth of labor-intensive industries is particularly important for ensuring employment among Africa's growing youth population. Another key step will be fostering competition between firms by reducing barriers to entry. For example, the Moroccan government's work to create networks of innovators in key industries, support research in advanced technologies, coordinate the efforts of the public and private sectors in innovation, and provide information for foreign investors can serve as a model for African countries exploring ways to encourage productive investment in new technologies. In line with successful examples seen in countries like Mauritius and Rwanda, countries can also establish science parks and technology hubs to encourage innovation. Another successful example is the creation of the Smart Africa Alliance, a collaboration between Smart

1 Wood, Johnny. 2018. "Morocco will soon unveil Africa's first high-speed rail link." World Economic Forum.

2 Yazgan, Sekip and Omer Yalcinkaya. 2018. "The Effects of Research and Development (R&D) Investments on Sustainable Economic Growth: Evidence from OECD Countries (1996-2015)." Review of Economic Perspectives 18, no. 1: 3-23.

3 Heney Paul. 2020. Global R&D investments unabated in spending growth. R&D World.

4 The Conversation. 2021. African countries must muscle up their support and fill massive R&D gap.

5 World Intellectual Property Organization (WIPO). 2021. "Innovation and intellectual property."

Africa, the Digital Impact Alliance, and the Kenyan government to create a framework used for developing and achieving a digital economy.⁶

- ✱ **Expand and support intra-regional trade and investment, as they accelerate industrial development and create a larger market for innovations.**

Lowering trade barriers within Africa can spur industrial growth and innovation, as it enables African countries to compete globally with the advanced economies that have historically dominated technological revolutions. The African Continental Free Trade Area (AfCFTA) represents a key stepping stone towards building a robust, competitive market for goods across Africa. Further cooperation among African states using existing multilateral arrangements such as the African Union and African Development Bank is a vital way for African states to pool their resources efficiently and reduce regional deficits in trade and infrastructure. The East African Northern Corridor Agreement, for example, could serve as a model for larger agreements extending into North and sub-Saharan Africa incorporating ICT integration and other infrastructure development.⁷ Technology, innovation, and entrepreneurship will be the accelerators in these projects. Additionally, regional organizations should create frameworks to help address youth unemployment challenges around the continent to help other expansion areas.

- ✱ **Create institutions to manage technological disruption, encourage innovation, and ensure security.**

Policies to support innovation and protect citizens are only as good as the institutions that enforce them. As such, leaders should set up agile institutions empowered to work across ministries. These institutions can also help ensure that consumers are protected from practices such as overpricing, poor quality, and privacy violations and can foster a fair and competitive ICT market. These institutions can also serve as catalysts for industrial policies, which may include tariffs, subsidies, incentives to businesses, infrastructure investments, and other measures aimed at improving the competitiveness of domestic firms and promoting innovation and structural transformation.⁸ Importantly, with digital innovation comes risks threatening privacy and security worldwide, so domestic policies and international cooperation can play a critical role in creating a more inclusive future. Thus, establishing a data privacy act and a national cybersecurity plan as well as identifying and addressing regulatory gaps related to new technologies can mitigate some of the risks presented by the technology and innovation revolution. (See the viewpoints on pages 92 and 100 for discussions on strategies for protecting consumer data by the private sector and policymakers, respectively.)

- ✱ **Ultimately, develop and successfully implement inclusive comprehensive national and continental strategies for harnessing technology and innovation for a better future in Africa, building on the recommendations presented above.**

Inclusive prosperity requires diverse stakeholders—including firms, government agencies, nonprofits, and individuals of various backgrounds—to check against organizational and group biases.⁹ Moreover, coordinated strategies facilitate policy coherence and equal implementation. Here, continental institutions (e.g., the African Union and its specialized agencies) can play a central role in balancing the interests of potential winners and losers.

Africa must improve its infrastructure and prepare its young workforce for new technologies to avoid asymmetric growth between it and the rest of the world.

In conclusion, to make the most out of technology and innovation, African governments and entrepreneurs should move proactively, anticipate disruptive innovations and their implications, build capacity and the conducive environment to unlock their potential, recognize new niches for industries, leverage uniquely African advantages, invest in their youth and entrepreneurial populations, and collaborate across stakeholders to achieve sustainable, inclusive growth. Given considerable gaps in infrastructure and R&D output, Africa must improve its infrastructure and prepare its young workforce for new technologies to avoid asymmetric growth between it and the rest of the world. The future of Africa depends on success in this endeavor.

6 Nyakanini Grace, Sayinzoga Maurice, Gates Nicholas, Almqvist Erik, Erkan Kutay. 2020. "Unlocking the Digital Economy in Africa: Benchmarking the Digital Transformation Journey." Dial-Smart Africa.

7 Meads, David. 2017. "Here's how Africa can take advantage of the Fourth Industrial Revolution." World Economic Forum.

8 UNCTAD and UNIDO. 2011. "Economic Development in Africa Report 2011."

9 Schwab, Klaus and Nicholas Davis. 2018. Shaping the Fourth Industrial Revolution. Cologny/Geneva: World Economic Forum.

Boosting the AfCFTA: The role of the Pan-African Payment and Settlement System

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It is said that, while money is the lifeblood of an economy, a well-implemented payment infrastructure is its circulatory system.

Imagine an Africa without boundaries—an African continent where commerce takes place freely between states, and goods and services are exchanged for value without the constraint of complex and often expensive customs procedures and tariffs.

This burgeoning, free-flowing mosaic of information, goods, and capital would certainly reshape the economies of African countries, encouraging African governments to rethink their policies, minimize trade costs, empower their workers, and take advantage of new opportunities.

I like to think that this Africa is the one envisioned by the African Union in the African Continental Free Trade Agreement (AfCFTA). A pact, which, if fully implemented, would connect approximately 1.3 billion people across 55 countries with a combined GDP of \$3.4 trillion.

In 2020, the World Bank found that the enforcement of AfCFTA has the potential of increasing African exports by \$560 billion while boosting Africa's income by \$450 billion by 2035.¹ Notably, it also reads, "out of the \$450 billion, \$292 billion would come from stronger trade facilitation—measures to reduce red tape, simplify customs procedures and make it easier for African businesses to integrate into global supply chains."

One such measure includes the development of a centralized payment and settlement infrastructure to support trade in this new arrangement—now led by Africa Export-Import Bank (Afreximbank) in partnership with the AfCFTA Secretariat and dubbed the Pan-African Payment and Settlement System (PAPSS). With PAPSS, payment facilitators—whether banks or emerging fintech ventures across Africa—will be able to plug in to make secure and instant payments on behalf of their customers.

FULLY REALIZED, WHAT COULD THE IMPLEMENTATION OF AFCFTA AND PAPSS LOOK LIKE?

It is said that, while money is the lifeblood of an economy, a well-implemented payment infrastructure is its circulatory system. The implementation of PAPSS is, therefore, critical to facilitating the smooth operation of a continent-wide marketplace and offers benefits to important stakeholders in the African private sector:

* For African businesses:

Businesses across Africa will enjoy the benefit of receiving and making payments instantly, which will increase trust and trade volumes, and free up time previously lost while waiting to confirm payments. For instance, if a fashion house in Accra were to purchase kikoy fabric from a small fabric manufacturer in Kenya, it would be able to pay for the fabric instantly and in its own local currency. The fabric manufacturer in Kenya would receive payment instantly into its bank account, in its local currency, thereby skirting currently common delays in customs and tax procedures—freeing up time to respond quickly to the order from Accra.

* For African commercial banks:

For banks involved in payment clearing and settlement, the successful implementation of PAPSS means a decrease in liquidity requirements for settlements as well as their

¹ "The African Continental Free Trade Area: Economic and Distributional Effects." World Bank, 2020.

own payments. Consequently, there will be fewer constraints on the funds they hold for settlements, freeing up more money for other value-added services and initiatives. More importantly, these banks would have a reduced need to source for scarce hard currencies to support transactions between two African markets.

✱ **For policymakers:**

Streamlining value exchange procedures aside, the successful implementation of PAPSS could help trace informal small-scale cross-border trade—an important aspect of African economies that is rarely fully captured and reported in official trade statistics. As a result, these common transactions are often not taken into consideration by policymakers and foreign investors when making decisions, which leads to financial exclusion and underestimation of the export potential of African countries

✱ **Last-mile users:**

Some of the world's fastest-growing and groundbreaking fintechs can be found across Africa, especially in Egypt, Nigeria, Kenya, South Africa, and beyond. These fintechs provide last-mile access to thousands of people and small businesses that ordinarily cannot be reached by formal banking structures. Just imagine the far-reaching economic impact of PAPSS when the clients of fintechs and those of the commercial banks across Africa are connected to a common and instant payment rail.

Notwithstanding, if the devastating international trade disruptions brought about by the COVID-19 pandemic have taught us anything as a continent, it should be that investing in regional trade is vital for helping African countries absorb future economic shocks as well as for enhancing long-term sustainable economic growth and development.

While ultimately, the onus falls on African governments to fully implement the AfCFTA, PAPSS is positioned to help spur and fast track this implementation. This gives me hope that Africa's future, even in a post-COVID-19 world, is headed in a positive direction—a path that is paved with innovation, financial inclusion, prosperity, and economic policy reform.

Africa needs smarter investment in digital infrastructure: Strategies for enticing the private sector

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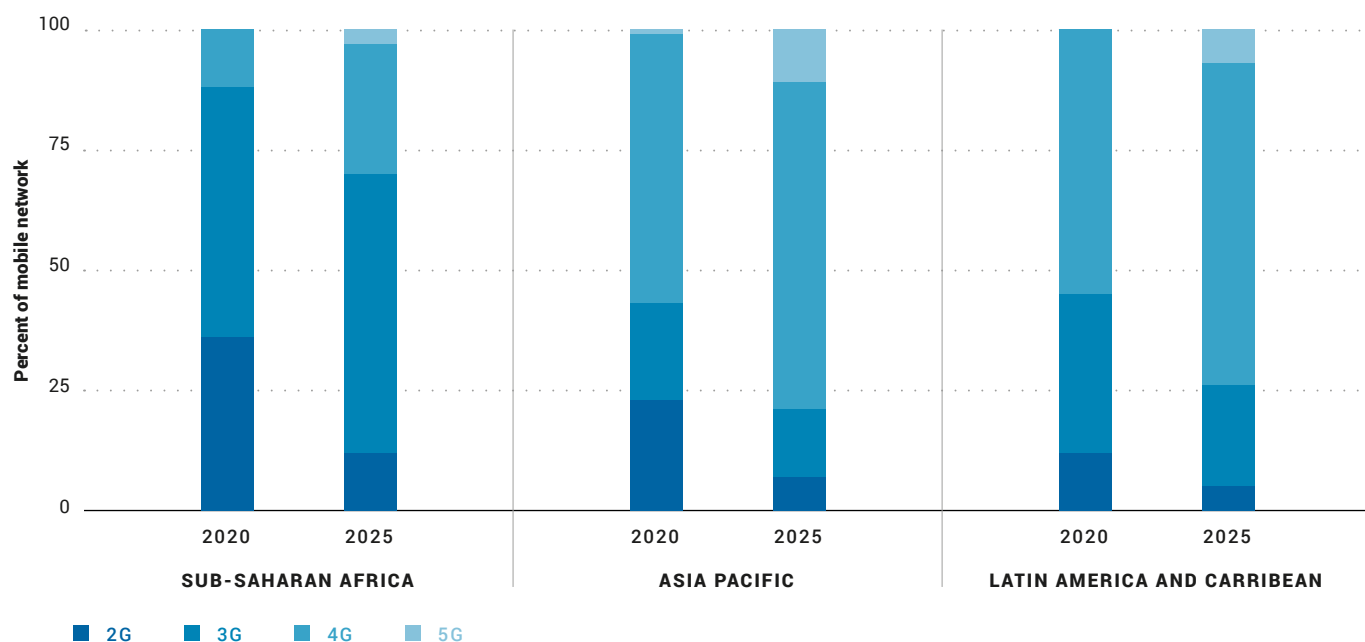
Weak infrastructure is widely accepted as a fundamental limitation to growth in Africa.¹ Governments in the region struggle to meet the basic needs of residents, including access to food, education, health, and livelihoods, much less invest in critical, reusable infrastructure that could provide long-term solutions to social problems.

Philanthropy alone will not lead to the sustainable infrastructure and employment needed to secure long-term health and financial security for individuals and economic prosperity for all African nations. Yet, the development community tends to focus on funding shortfalls, calling for increased official development assistance (ODA), increased government spending despite Africa's rising budget deficit problem, and calling for the private sector to "collaborate," "partner," and "step up"—often euphemisms for donations.

¹ "Africa's Infrastructure: Great Potential but Little Impact on Inclusive Growth." *African Development Bank*, 2018. World Bank "Green, Resilient, and Inclusive Digital Infrastructure in Africa." *World Bank*, 2021.

FIGURE 5.3. MOBILE TECHNOLOGY IN SUB-SAHARAN AFRICA IS SLOWLY SHIFTING AWAY FROM 2G

Currently, mobile networks in sub-Saharan Africa rely much more on older 2G and 3G network technology than other developing regions. By 2025, however, the use of 2G technology sub-Saharan Africa's network is estimated to drop significantly.



NOTE: Data for Asia Pacific includes Southeast Asia and excludes China, Hong Kong, Macao and Taiwan. Data for Latin American and the Caribbean includes Mexico. See "The Mobile Economy 2021." GSMA, 2021 for a detailed list.

SOURCE: "The Mobile Economy 2021." GSMA, 2021.

We would be better served as a global community to entice, encourage, and de-risk private sector engagement in the infrastructure challenge by channeling existing ODA, private philanthropy, and government resources towards creating an enabling environment for the private sector to innovate, deliver, and employ.

Instead, we should focus on the operational, legal, and commercial barriers to deploying sustainable infrastructure, and how we can invest more wisely to overcome those challenges. We need sustainable commercial models that enable service delivery and provide employment at scale.

By design, private sector solutions must be commercially sustainable in order to deliver at scale and long-term. We would be better served as a global community to entice, encourage, and de-risk private sector engagement in the infrastructure challenge by channeling existing ODA, private philanthropy, and government resources towards creating an enabling environment for the private sector to innovate, deliver, and employ.

One such example, where I have experience, is digital infrastructure. Digital infrastructure is not only a means to deliver aid and other critical services, but also enables commerce and, thus, the means for economic growth. Digital inclusion, particularly in the wake of the COVID-19 pandemic, has proven critical for filling gaps in physical infrastructure that leave the most rural and marginalized communities behind.

Developing and managing secure digital solutions requires extensive knowledge across issues like data privacy and security, interoperability standards, franchise management, biometric tokenization, device security, and more. This knowledge resides with the private sector companies that are investing billions to continually innovate, to prevent fraud, and to prevent bad actors from accessing personal data.

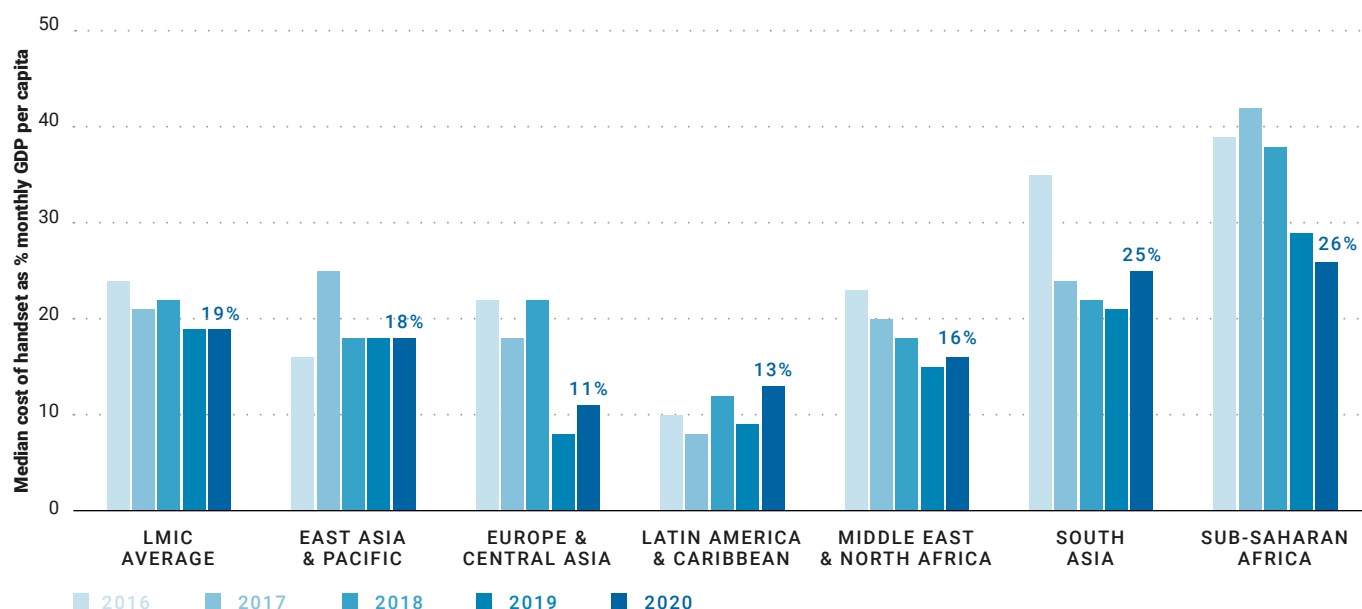
However, four fundamental challenges to private sector engagement in fragile contexts persist:

- ✱ **There is too much reliance on sub-standard, expensive products.**

Too often multilateral institutions, governments, and donors spend billions on technologies, including internally-developed systems, which do not meet the highest standards of data privacy and security, putting the personal data of millions of users at risk. These are typically well-meaning yet misguided efforts to promote local innovation, or occur because public sector institutions believe they are saving money by developing

FIGURE 5.4. MOBILE PHONES ARE MORE AFFORDABLE IN SUB-SAHARAN AFRICA NOW, BUT STILL REMAIN THE MOST EXPENSIVE

Although internet-enabled mobile phones have become more affordable in Africa and throughout the developing world, entry-level mobile phones remain relatively more expensive in sub-Saharan Africa than any other low- and middle-income country region. Despite the lingering high cost of internet-enabled mobile phones in sub-Saharan Africa, their cost, as a percentage of monthly GDP per capita, has decreased one-third since 2016.



SOURCE: "The state of mobile internet connectivity: 2021." GSMA, 2021.

in-house. For example, U.N. agencies have internally built data platforms that collect sensitive data, like religion, use beneficiaries' data without informed consent, and may not meet best-in-class security standards.² Yet, private sector companies already have secure, interoperable digital infrastructures with data privacy by design that can be rapidly deployed in fragile, offline contexts. The UN could benefit from leveraging the innovation of the private sector, which has the potential to be quicker, less expensive, more scalable, and more secure than solutions developed in the public sector alone.

What if private sector capabilities were leveraged as they existed, and funding redirected to incentivize and de-risk private sector innovation for the gaps?

- ✱ **There are too few entities at the last-mile servicing rural communities.**

Companies such as mine have built data secure ways for banks, AgTechs, healthcare providers, and the like to deliver services to rural communities. However, we struggle to find entities with large agent networks to service and provide cash management capabilities at the last mile. Agent networks are critical for enabling rural commerce, and they provide high-value jobs. **What if donors and NGOs redirected funds towards building a last-mile capability that both local and global businesses could leverage?**

- ✱ **Sustainable commercial models are lacking.**

Today, requests for proposals (RFPs) are the primary commercial tool for governments, NGOs, and U.N. agencies to contract with the private sector. Yet the RFP is a blunt and poorly fashioned tool in digital areas where agencies do not know what they need, and multilateral institutions often preclude necessary upfront discussions with suppliers to avoid any appearance of impropriety. Moreover, qualifying processes are often market-by-market with a market potential of only a few thousand beneficiaries. This state of affairs precludes most large-scale actors from responding, as the opportunities are not commercially viable, and local actors often lack the capacity to respond to complex

2 Parker, Ben. "Audit exposes UN food agency's poor data-handling." The New Humanitarian, 2018.

So much more can be done with existing aid flows to build sustainable infrastructure and create employment—if private investment is incentivized.

RFPs that are not written in the local language. **What if private sector experts worked in concert with governments and development actors to develop a best-in-class solution architecture that private sector actors were paid to execute at an overall lower cost?**

*** The regulatory landscape for digital transactions in emerging markets is nascent, murky, and complex.**

Operating in these environments is unattractive to private sector companies that need to navigate limited yet rapidly evolving policies on data security and privacy, Know-Your-Customer (KYC) laws, and more. What's more, many governments are enacting on-soil regulations in ill-conceived attempts at data security, even though replicating systems in small markets adds significant cost to an already low/no profit economic model. Still worse, many supranational humanitarian and development actors actively collect and store sensitive data on laptops and other manners vulnerable to attack.

What if governments partnered with the private sector to develop regulations that created an enabling environment for innovation and deployment, while ensuring individual protections? (For a discussion on the future of data governance in Africa, see the viewpoints on pages [92](#) and [100](#).)

Helping communities across Africa access the critical services they need would benefit the entire world. So much more can be done with existing aid flows to build sustainable infrastructure and create employment—if private investment is incentivized. We need to create an efficient and effective model to deploy the private sector resources we have now—and in the digital age that must begin with the construction of a more effective digital infrastructure that can leverage the capabilities of private industry.

The private sector must do its part on data governance in Africa

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The last decade has seen an acceleration in the digitization of many aspects of our lives including financial services, commerce, education, and healthcare. Data gathering and exchange have accelerated alongside this swift uptake of digital engagement, and data has become the new essential commodity—with Africa as the next frontier. However, this rapid change brings along questions of data governance and privacy, especially as the implementation of the African Continental Free Trade Area (AfCFTA) moves forward. As the tech sector waits for regulators to catch up, individual companies can do more to protect consumers on their own.

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THE NEW OIL

Observing the commoditization of data as well as its attendant opportunities and challenges in Africa, it is hard to ignore that the analogy of data as the “new oil” is a powerful and prescient one. The commercialization of this resource can unlock considerable value for the continent in sectors critical for the development of thriving and connected economies. However, commercialization must be approached responsibly, as we have seen in the case of oil: If the exploitation of a resource is not well planned, unintended consequences—typically burdening the most vulnerable in our societies—arise.

OPPORTUNITIES FOR THE PRIVATE SECTOR TO STEP UP

Technology businesses should not wait to be the recipients of policy. As subject matter experts in the complex value networks and core infrastructure (e.g., cloud computing) that underpin their business model, they need to act quickly.

For robust data protection on the continent, policymakers and the private sector must work together to create and implement feasible regulations and best practices.

For robust data protection on the continent, policymakers and the private sector must work together to create and implement feasible regulations and best practices. Given the private sector's experience navigating the relevant technical issues in this complex space, tech companies' role in data governance should be twofold: 1) inform proposed policies and 2) create and implement their own high standards. Such actions should include:

- ✱ **Establish a self-regulating organization (SRO) to improve data policy relevance and enforcement.**

Bottom-up innovations from startups and civil society networks are building tools and forging a collective voice to address data inequality, constructing a new social contract between the tech industry and citizens.¹ In Southeast Asia, for example, the [Indonesia FinTech Association](#) serves as an SRO that works in close collaboration with the [Financial Authority](#) to define and enforce good data governance practices.

- ✱ **Implement proportional risk and accountability frameworks.**

The onus is on organizations to enforce data protection frameworks to build trust with all stakeholders.² Importantly, requirements must be robust while also being within reach. The accountability-based approach towards data protection requires organizations to tailor policies that consider the business needs and the risk environment. This type of engagement across public, private, and even social sectors not only can lead to better data protections for customers but also the development of standardized frameworks and approaches to increase the [efficiency of doing business](#).³

- ✱ **Invest in consumer education.**

As individuals, we make decisions on our data based on trade-offs: How much privacy do I give up in return for a service that is valuable to me? However, this data could be used for other purposes, often without the consent of consumers. Therefore, consumer education on the different ways that their data is being used is essential. While funding for such education is usually borne by government, multilaterals, and foundations for digital public good, we are [seeing the private sector stepping up](#) to join force.⁴

- ✱ **Build safeguards against digital harms.**

Data can improve the lives of the poor; however, it can also open back doors that can harm individuals, businesses, and societies. To address this tension between the helpful and harmful potential of data, the [World Bank's World Development Report 2021: Data for Better Lives](#)⁵ calls for a new social contract that enables the use and reuse of data to create economic and social value, ensures equitable access to that value, and fosters

Challenges from Disinformation and Digital Harm - The World Economic Forum paper, [Pathway to Digital Justice](#), focuses on the victim's perspective concerning digital harm. Digital harm can happen to anyone and is particularly challenging when the harm is online and across multiple jurisdictions. What is the redressability for the victim of digital harm? The harm goes beyond an individual victim; it could have a silencing effect on women and minority groups, shutting them out from participation in society.

¹ Omidyar Network. "The push for fairness, equity, and safeguards in the data economy." Medium, 2021.

² According to Mr. Yeong Zee Kin, Singapore Deputy Commissioner, Personal Data Protection Commission, "Organizational accountability goes beyond being answerable to regulators. It is to win the trust of all the organizations' stakeholders including its consumers."

³ One example is the "Data Sharing Handbook"—a joint project between the Association of Banks in Singapore and the Singapore Monetary Authority, which has made safe data sharing possible between banks and fintechs.

⁴ "Helping equip South Africans with digital skills needed for economic recovery." Microsoft, 2020.

⁵ "World Development Report 2021: DATA FOR BETTER LIVES." World Bank, 2021.

The potent mix of digital technology and data can only offer an improved and sustainable future for the continent if there is a cohesive plan of action for infrastructure, governance, and regulation.

trust that data will not be misused in harmful ways. Responsible artificial intelligence (AI) is a movement that ensure data-intensive AI systems are ethical and fair.⁶

✱ **Break data silos and empowering consumer with choices.**

It is important that the interests of consumers are protected. Moreover, value must be shared fairly between businesses and consumers, which necessitates proactively addressing issues such as data silos or complex consent artefacts that unfairly disadvantage consumers or competitors. Big Tech (Apple, Facebook, Google, Microsoft and Twitter) formed the Data Transfer Project for an “open-source, service-to-service data portability platform such that consumers could easily move their data between online service providers whenever they want.”⁷

The potent mix of digital technology and data can only offer an improved and sustainable future for the continent if there is a cohesive plan of action for infrastructure, governance, and regulation. Africa needs a growth-oriented governance approach; such an approach will nurture business innovation and ensure that benefits are distributed fairly, while also maximizing protections and minimizing harms for customers. The private sector should not wait for regulators to protect consumer data in Africa. It needs to start now.

6 “Data fairness: A new social contract for the 21st century economy.” MIT Technology Review, 2021.

7 “About us.” Data Transfer Project, 2021.

Africa and the future of digital diplomacy

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Digital diplomacy¹ refers to the broad use of technology, particularly the internet and other information and communication technologies (ICTs)-based innovations, in the conduct of diplomacy. With new technology providing access to instant information and interactive online communication, the use of these tools by diplomats and government officials is becoming widespread. In fact, the internet has three fundamental impacts on diplomatic relations: First, it multiplies and amplifies the number of voices and interests involved in international policymaking. Second, it accelerates and frees the dissemination of information—accurate or not—about any issue or event. Third, it enables traditional diplomatic services to be delivered faster and more cost effectively.²

The COVID-19 pandemic has further revealed the great extent to which the modern world depends on technology and digital tools. Like every other aspect of life, diplomacy also had to go “digital,” with many activities transferred online due to pandemic-related gathering restrictions. Zoom, Google Meet, and other such platforms became important platforms for global decision-making gatherings, diplomatic meetings, and conferences as travels became impossible or infeasible. In many ways, the pandemic’s disruptive element has helped unleash new forms of virtual decision-making processes.

During this disruptive time, African countries have embraced digital diplomacy through these virtual processes. For example, despite the pandemic, African governments, the

1 Adesina, Olubukola S. “The Nigerians in Diaspora Commission (NIDCOM): An example of digital diplomacy in practice.” Africa Portal, 2020.

2 Westcott, Nicholas. “Digital Diplomacy: The Impact of the Internet on International Relations.” Oxford Internet Institute Working Paper, 2009.

Social media platforms... have proven to be powerful instruments for influencing the public, especially in terms of enhancing a country's image, among many other uses.

African Union (AU), and non-governmental organizations have held several virtual peace and security conferences, bringing together thousands of African stakeholders.³ In May 2020, the AU successfully hosted a "Silencing the Guns" online conference, which was spread over three weeks. Participants attended both physically and virtually, contributing to the debate and making new connections. African leaders—e.g., AU Chairman President Cyril Ramaphosa of South Africa—have been holding online meetings with stakeholders since the beginning of the pandemic. These online discussions have not only reduced the costs of bringing together key stakeholders, they have also enabled faster decision making, as more participants, who may not have attended ordinarily for various reasons, are available for negotiations.

However, these successes do not necessarily imply that virtual meetings should replace the tradition of face-to-face interactions. Instead, they should be complementary. Physical meetings are important because negotiations often take place on the sidelines of international gatherings, through impromptu discussions between global leaders at tea or lunch breaks, or a chance encounter in the corridor or rest room and so on. Also, physical meetings provide an opportunity for participants to observe and interpret body language and emotions of the parties, which may help in decision making. Thus, hybrid format of physical interactions and online meetings seem to be the best approach for diplomatic engagements. Meetings should be held physically as they become more focused on decision making and high-level representation, such as issues that demand high level of secrecy, involve conflict situations, or complex negotiations.

At the same time, social media platforms—including Twitter, Facebook, WhatsApp, and Instagram—have proven to be powerful instruments for influencing the public, especially in terms of enhancing a country's image, among many other uses. For example, many African leaders, ministries of foreign affairs (MFAs), and other related agencies operate social media accounts, especially Twitter and Facebook. Notably, Nigeria's President Muhammadu Buhari is the most followed African leader with more than 5 million followers on Facebook, Instagram, and Twitter combined.⁴ He is followed by Ghana's President Nana Akufo-Addo and Rwanda's President Paul Kagame with more than 4 million followers on all three social networks combined. Kenya's President Uhuru Kenyatta was the most followed African leader with more than 7 million followers on Facebook, Instagram, and Twitter combined until he deactivated his accounts in March 2019, which according to him was due to the constant insults and name-calling that flooded his timeline.⁵ Furthermore, at the height of the COVID-19 pandemic, social media platforms helped many MFAs and agencies to maintain ties with some of their country's citizens abroad and to provide them with valuable consular assistance.⁶

Digital diplomacy, however, faces a number of challenges in Africa, including poor ICT infrastructure (e.g., reliable and affordable internet and power). Top leaders have also shown distrust of the internet, with several African governments (e.g., Uganda, Tanzania, Zimbabwe, Togo, Burundi, Chad, Mali, and Guinea) controversially shutting down or restricting access to the internet and social media platforms. The Nigerian government also placed a ban on Twitter on June 4, 2021, two days after the company deleted a tweet by President Buhari that threatened to punish regional secessionists, which Twitter said violated its rules.⁷

These obstacles hold Africa's digital diplomacy back. In essence, as a supplement to traditional diplomacy, African countries need to embrace the full potential of digital diplomacy in order to advance their foreign policy goals, extend international reach, and influence foreign audiences in the cyber space. Importantly, African countries should leverage their position in the global diplomatic arena with the use of social media. By being active on the social media platforms, MFAs can accelerate the dissemination of accurate information and enable traditional diplomatic services to be delivered faster and more cost effectively. Moreover, they can amplify the voices and interests of their countries in the international community, thereby boosting the countries' image and furthering their goals.

3 Carvalho, Gustavo De. "Africa Must Unmute its Mic as E-Diplomacy Takes Root." Institute for Security Studies, 2020.

4 "Africa." Twiplomacy, 2021.

5 Kejitan, Vincent. "Uhuru: Why I Deactivated My Twitter Account." Standard Media, 2020.

6 Adesina, Olubukola S. "The Nigerians in Diaspora Commission (NIDCOM): An example of digital diplomacy in practice." Africa Portal, 2020.

7 "Muhammadu Buhari: Twitter deletes Nigerian leader's 'civil war' post." British Broadcasting Corporation News, 2021.

The role of cryptocurrencies in sub-Saharan Africa

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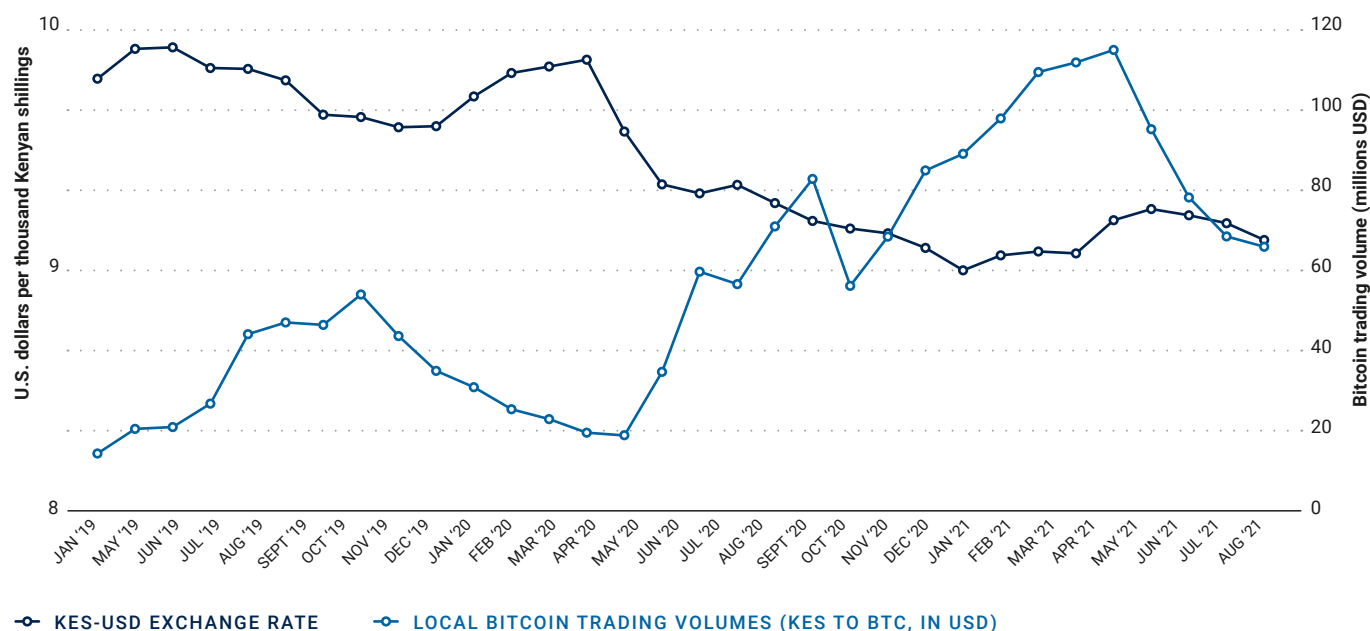
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Although the African continent¹ receives only 2 percent of the global value of all cryptocurrencies, their rapid growth will transform financing in an increasingly digital and urban sub-Saharan Africa. In fact, a recent report by Chainalysis, a blockchain data platform, found that between July 2020 and June 2021, Africans received \$105.6 billion worth of cryptocurrency payments—an increase of 1200 percent from the year before. Notably, Chainalysis ranks Kenya, South Africa, and Nigeria among the top-10 countries for cryptocurrency use.^{2,3}

Because cryptocurrency platforms bypass traditional banking services by introducing decentralized peer-to-peer lending services, they can help level the economic playing field and expand finance options to underserved customer markets. Indeed, cryptocurrencies are well-positioned to address a number of economic challenges in the region, from

FIGURE 5.5. CRYPTOCURRENCY AS A HEDGE AGAINST CURRENCY DEVALUATION: EVIDENCE FROM KENYA

Evidence from Kenya suggests that, early in the COVID-19 pandemic, the trading volume of bitcoin in Kenya and the value of the Kenyan shilling were negatively correlated. In other words, as the price of the Kenyan shilling fell, Kenyans sold their shillings and purchased bitcoins.



SOURCE: "2021 Geography of Cryptocurrency Report." Chainalysis, 2021.

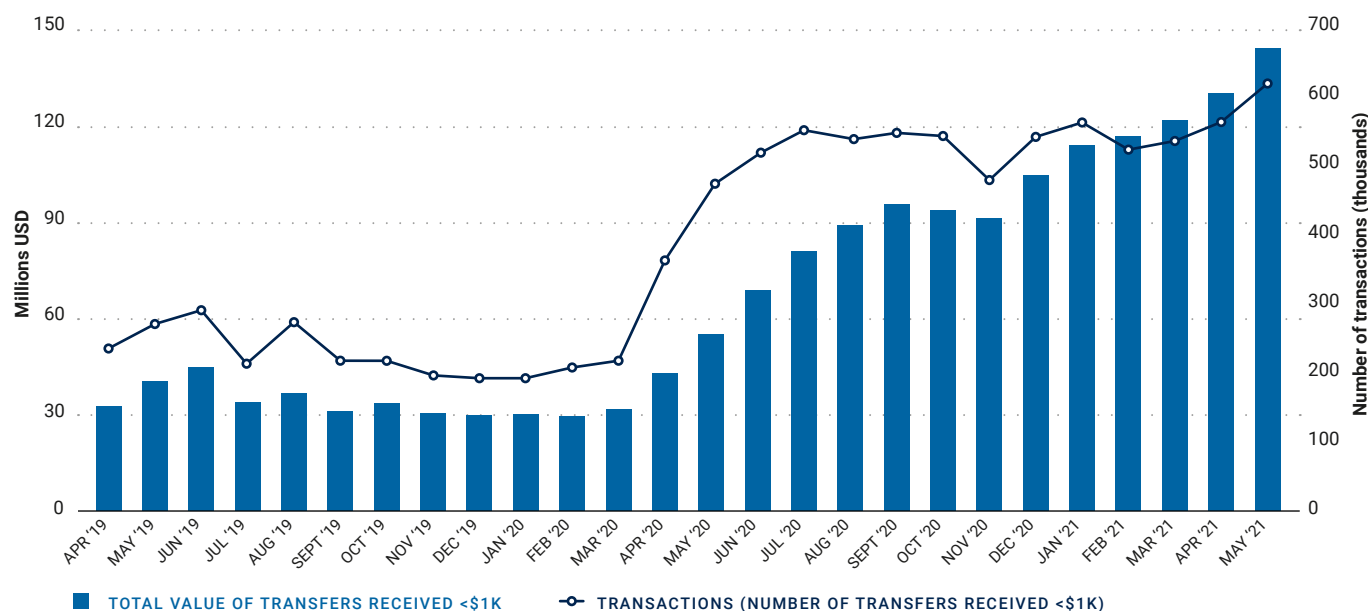
¹ Not including Egypt.

² Chainalysis weighs total value received, retail value received (transfers over \$10 thousand), and peer-to-peer exchange volume (number of transactions) in its rankings.

³ "The 2020 Geography of Cryptocurrency Report." Chainalysis, 2020.

FIGURE 5.6. THE GROWING ROLE OF CRYPTOCURRENCY FOR REMITTANCE PAYMENTS IN AFRICA

Cryptocurrencies hold enormous potential to improve remittance payment systems, offering a fully digital, rapid, and low-cost cross-border payment platform. Whereas international wire transfer fees cost an average 7 percent of the total amount sent and could take several days to clear, some cryptocurrencies are designed to support foreign exchange and money transfers for less than a U.S. penny and process payments in 3 to 5 seconds. Cryptocurrency transfers associated with remittance payments have experienced rapid growth, both in terms of value and volume, since the start of the COVID-19 pandemic.



NOTE: It is impossible to decipher the intended purpose of individual cryptocurrency transfers, so many experts use retail-sized transfer payments (less than \$1000) as an indication of cryptocurrency usage in remittance networks.
SOURCE: "2021 Geography of Cryptocurrency Report." Chainalysis, 2021.

Because cryptocurrency platforms bypass traditional banking services by introducing decentralized peer-to-peer lending services, they can help level the economic playing field and expand finance options to underserved customer markets.

reducing financing gaps for micro-, small-, and medium-sized enterprise (MSME) sectors to facilitating the transfer of remittances. In fact, of the \$48 billion remitted to sub-Saharan Africa in 2019,⁴ Chainalysis estimates that up to \$562 million worth of remittance payments were facilitated by cryptocurrencies such as Ripple.^{5,6} Cryptos have also accelerated affordable mortgages and are accommodating irregular income patterns that limit credit.

Empowa, a Mozambique fintech start-up, exudes the spirit of this new movement—the democratization of finance—by crowdsourcing funding to finance residential real estate development through cryptocurrency.⁷ As such, it demonstrates decentralized finance's proof of concept in Africa, circumventing traditional bottlenecks in financing homes and harnessing the blockchain platform to channel finances toward developers and innovators.⁸ Similarly, Pezesha, a Kenyan fintech focused on MSME credit scoring and loan origination, unlocked new capital by converting the cryptocurrency community into MSME lenders in East

Top 10 Countries in Crypto Adoption

1. Ukraine
2. Russia
3. Venezuela
4. China
5. Kenya
6. United States
7. South Africa
8. Nigeria
9. Columbia
10. Vietnam

Source: "The 2020 Geography of Cryptocurrency Report." Chainalysis, 2020.

⁴ "World Bank Predicts Sharpest Decline of Remittances in Recent History." World Bank, 2020.

⁵ This estimate is based on retail-sized cryptocurrency transfers under \$10,000.

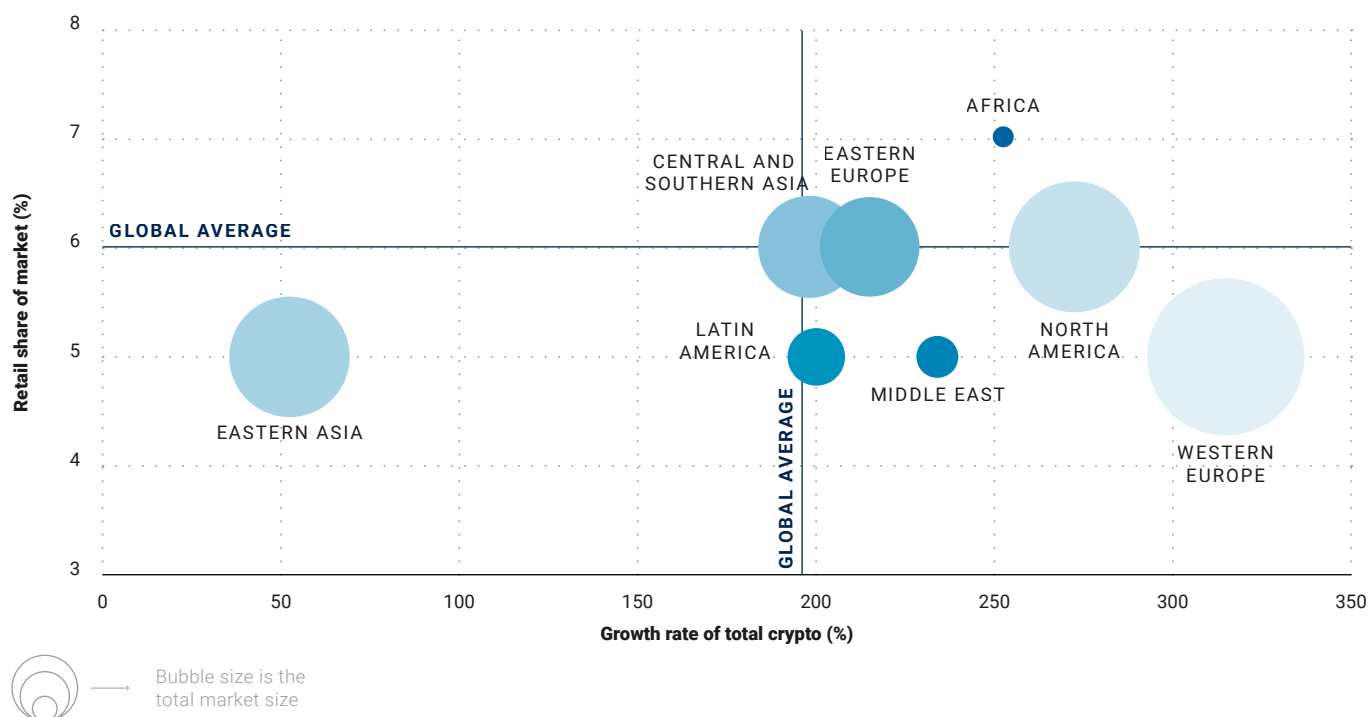
⁶ "The 2020 Geography of Cryptocurrency Report." Chainalysis, 2020.

⁷ Empowa: White Paper, 2021.

⁸ Empowa is partnering with Mozambiquan affordable housing developer, Casa Real, to extend access to affordable mortgages.

FIGURE 5.7. AFRICA'S CRYPTOCURRENCY MARKET IN A GLOBAL CONTEXT

Africa is the fastest-growing cryptocurrency market among developing economies and the third-fastest growing market in the world. However, it also remains the smallest. Notably, Africans living abroad have begun using the novel digital currency to send remittance payments back home. In fact, Africa also comprises the highest ratio of retail crypto transfers, which is an indicator of crypto's usage for remittances.



NOTE: Retail market represents transfer payments below \$10,000. Retail share of market data collected from July 2020 – June 2021. Growth rate of cryptocurrency accounts for the entire market and compares data from June 2019 – July 2020 and July 2020 – June 2021.

SOURCE: "2021 Geography of Cryptocurrency Report." Chainalysis, 2021.

Blockchain technologies are the future, and any effort to ban them—or even excessively intervene in their operations—would meet the same fate as other state attempts to circumscribe behavior.

Africa, introducing a global pool of lenders to invest directly in Kenyan enterprises. It saw a threefold turnover for one of its short-term loan portfolios in a four-month period. This venture enables foreign lenders to send USD stablecoin (a type of digital currency that is pegged on some external asset, such as fiat currency or other assets like gold), convert it to Kenyan shillings, and leverage other credit-scoring facilities to bridge the capital divide between MSMEs and investors. As of this writing, Pezesha has facilitated over 3,751 loans in Kenya and 344 in Ghana.

Countries with crypto exchanges but no regulatory framework: Cameroon, Côte d'Ivoire, Ghana, Nigeria, Senegal, and South Africa

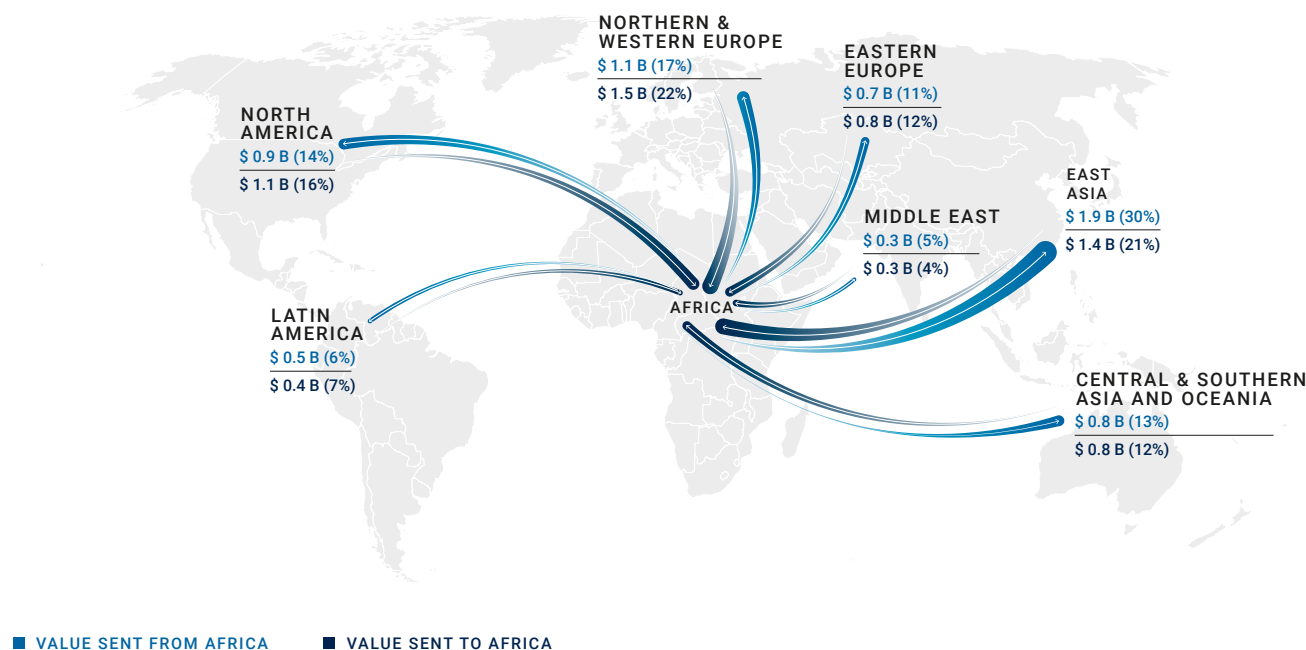
Countries that allow trading but do not provide an exchange: Botswana, Kenya, Zimbabwe

While decentralized finance and blockchain technology are scalable and have been operationalized in other countries in other countries and regions, African policymakers have struggled with how to reconcile cryptocurrencies with their existing monetary system. Many countries in Africa have, in fact, overlooked this financial innovation—maintaining crypto exchanges but failing to offer a regulatory framework or begrudgingly allowing trading but not providing their citizens an exchange.

Government cannot "shut the stable door after the horse has bolted." Blockchain technologies are the future, and any effort to ban them—or even excessively intervene in their operations—would meet the same fate as other state attempts to circumscribe behavior. Moreover, restricting cryptocurrencies at the moment, when they are facilitating innovations and brimming with potential, would undermine financing of critical sectors

FIGURE 5.8. AFRICAN CRYPTOCURRENCY FLOWS BETWEEN COUNTRIES

The volume of cryptocurrency flows between Africa and the world offers a novel lens to analyze the continent's financial connections. Northern and western Europe, East Asia, and North America, respectively, comprise the largest regional shares of cryptocurrency inflows into Africa, accounting for approximately 59 percent of the \$6.7 billion sent to Africa via cryptocurrency between July 2019 and June 2020. These dominant connections correspond with the size of African immigration networks abroad, who send remittances back home, as well as the growing involvement of China in African commerce and the presence of Chinese nationals working in Africa. Conversely, East Asia receives more than twice the amount of cryptocurrency outflows from Africa than Northern and Western Europe and North America, the second- and third-largest destinations of cryptocurrency sent from Africa.



NOTE: Percentages in parentheses represent a region's respective share of inflows and outflows to/from Africa.

SOURCE: "2020 Geography of Cryptocurrency Report." Chainalysis, 2020.

like MSMEs, affordable housing, and remittance payments right when Africa needs these options most.

Still though, government does—and should—have a role to play. Kenya, for example, has recently established a "regulatory sandbox"⁹ to crowd-source financing for MSMEs. This sandbox, according to the Kenyan Capital Markets Authority, is a "tailored regulatory environment that allows for the live testing of innovative capital markets related products, solutions and services with the potential to deepen and develop the capital markets prior to launching into the mass market."¹⁰ In other words, Kenya's approach to artificial intelligence and blockchain was to offer a safe space for the supervision of burgeoning technologies, techniques, or services with the potential to benefit the public. This approach allows the state to encourage experimentation and development without officially authorizing new practices. In addition to building capacity to track and trace all transactions, ensuring proper identification for all citizens (to validate clients and ensure the security of transactions), and shoring up a robust cybersecurity system, countries in Africa should establish their own regulatory sandboxes.

While no one can predict the future of cryptocurrencies, what we do know is that their novelty requires an equally nontraditional regulatory approach—one as invested in the virtues of experimentation and entrepreneurship as the practices it aspires to oversee.

⁹ "Capital Markets Authority Regulatory Sandbox." Capital Markets Authority of Kenya, 2021.

¹⁰ "What it is: Capital Markets Authority Regulatory Sandbox." Capital Markets Authority of Kenya, 2021.

Developing an effective data governance framework to deliver African digital potentials

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Rapid digitalization has the potential to enhance structural transformation among African countries as well as galvanize progress on regional developments like the recent African Continental Free Trade Area. However, these benefits are not guaranteed given the multipronged threats in the digital space that can limit trust and curtail the adoption of such innovations. Indeed, the platform-based business model that dominates the digital economy raises fundamental issues about data protection and citizens' privacy. Likewise, the monopoly market structure that characterizes the digital platforms implies a winner-takes-all paradigm, leaving less for developing economies. Rising cybercrime, ransomware, and digital identity theft pose significant threats: African economies lost over \$3.5 billion through cyberattacks in 2017 alone.¹ The more worrisome threat emanates from the rise in the number of African states with spyware, surveillance, censorship, and internet shutdowns. This trend is affecting trust in the digital space.

The intersections of these threats could significantly affect the transformational impacts of digitalization; hence, there is a need for a data governance framework that maximizes the potential gains (through enablers) and limits the threats (through safeguards).

STATE OF DATA GOVERNANCE IN AFRICA

✱ There is a proliferation of laws and regulations on data protection.

Between 2012 and 2021, the number of African countries with at least one form of data protection law tripled from 12² to 28.³ Though the current adoption rate is 52 percent for the African region, it is still the lowest relative to other regions. Notably, the data governance framework tends to show more emphasis on fostering safeguards (e.g., data protection, privacy), and less focus on enablers (e.g., data portability, localization)—but both efforts are crucial.

✱ Implementation remains a challenge.

Institutions charged with regulating data governance have not evolved with the dynamic needs and peculiarities of the digital space. Regulatory inertia and capacity challenges that characterize broader governance in Africa are manifesting in data governance implementation, given that this structure is embedded within the existing public institutional framework. The implementation gap is further worsened by the limitations in human and financial capacity of regulatory agencies, and power and knowledge asymmetry between platform firms and mostly small and resource-constrained African countries.

✱ There is more progress at the national level than through regional and multilateral frameworks.

Given the fragmented data policy environment and capacity gap in Africa's digital space, scaling up regional efforts is crucial for addressing the inadequacies in the national efforts: Even developed countries like those in Europe have found a regional approach to be an effective means of addressing power and knowledge asymmetry. Currently, only

¹ "Africa Cyber Security Report 2017." Serianu, 2017.

² Greenleaf, Graham. "Global Data Privacy Laws 2019: 132 National Laws & Many Bills." Privacy Laws & Business International Report, vol. 157, 2019, pp. 14-18.

³ "Data Protection and Privacy Legislation Worldwide." United Nations Conference on Trade and Development, 2021.

eight African countries have ratified the Malabo Convention,⁴ the regional-led approach for data protection and cybercrime law. Similarly, only six African countries are participating in the World Trade Organization's e-commerce plurilateral negotiations,⁵ which will set up new global trading rules for electronic commerce and trade.

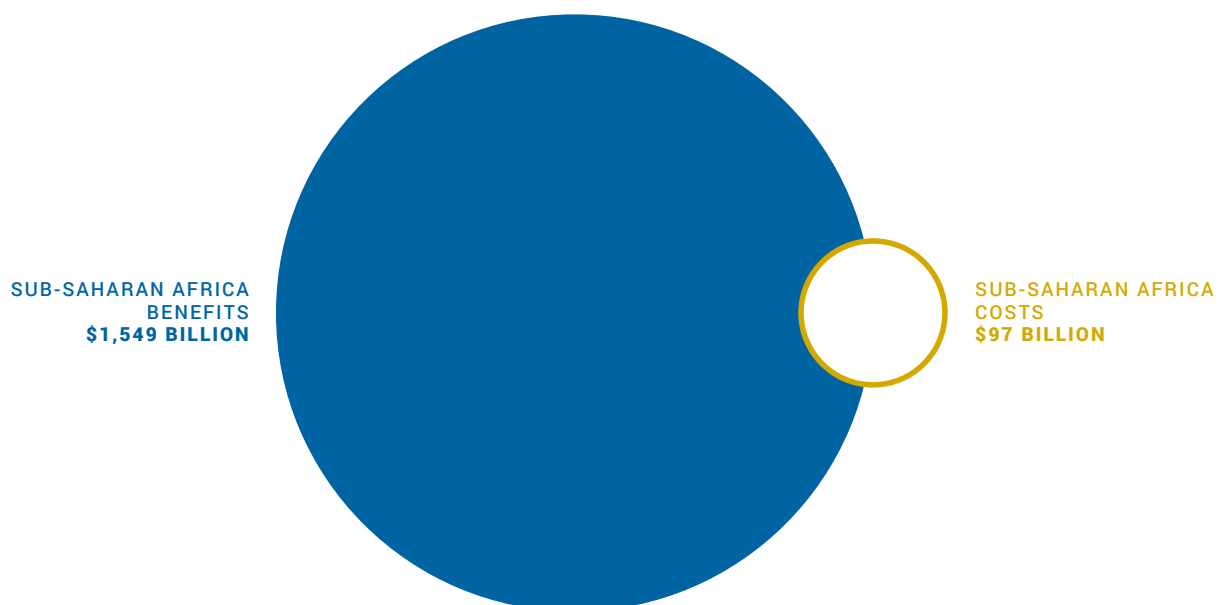
RECOMMENDATIONS

Policymakers must build checks and balances into the data governance framework, as a monopoly in data governance, either by government or the private sector, will hinder digital development.

- ✱ Policymakers should scale up efforts on “enabler” laws, especially around e-commerce, for safe and secure financial settlements, improved and better enforcement without recourse to data protectionism, and enabling cross-border data flows. In general, enhancing the implementation capacity with investment in finance, manpower, and technical skills of data regulatory authorities is important to ensuring data governance supports development outcomes.
- ✱ Policymakers must build checks and balances into the data governance framework, as a monopoly in data governance, either by government or the private sector, will hinder digital development. Civil society accountability and regional cooperation are also needed to limit state abuses as well as platform companies’ abuse resulting from their dominance and gatekeeper roles in the digital space.
- ✱ National and regional leaders must enhance collaboration and coordination around strengthening regional data governance, sharing mechanisms and experiences for best practices in regulating the digital space, and committing more to multilateral frameworks for data governance.

FIGURE 5.9. ECONOMIC BENEFIT OF ACHIEVING UNIVERSAL INTERNET ACCESS

The cost to achieve universal internet access is greatly overshadowed by its downstream economic benefits. These economic gains are estimated to be more than 15-fold greater than the cost of implementing universal internet access in sub-Saharan Africa.



NOTE: Universal internet access is defined as at least 4G or equivalent connection for 90 percent of the population over 10-years-old

SOURCE: "The Progressive Case for Universal Internet Access: How to Close the Digital Divide by 2030." Tony Blair Institute For Global Change, 2021.

4 "List Of Countries Which Have Signed, Ratified/Acceded to the African Union Convention on Cyber Security and Personal Data Protection." African Union, 2020.

5 "Data Governance in Africa - Pathways For Strengthening Confidence In The Digital Economy." Centre For the Study of the Economies of Africa, 2021.