

Approach Paper

Universal Digital Inclusion and Usage

July 20, 2022

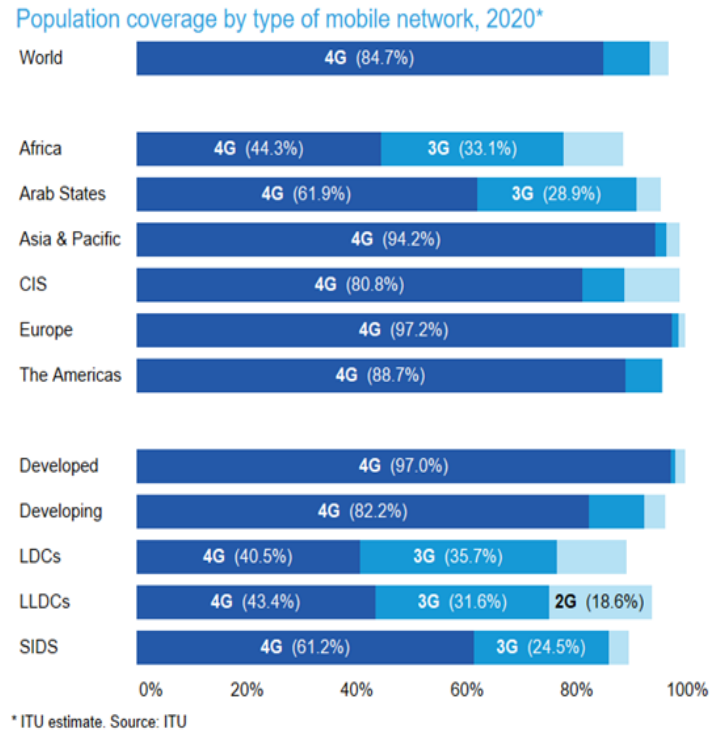
1. Background and Context

1.1 Available, affordable, and accessible digital connectivity can help deliver essential services, such as education and health care, and lead to an increase in economic growth. The International Telecommunication Union estimates that an expansion of mobile broadband in Africa by 10 percent would result in an increase of gross domestic product of 2.5 percent per capita (ITU 2019).¹ High levels of digital inclusion also offer increased opportunities for closing the gender gap and youth empowerment, and for community development and environmental sustainability (Woodhouse 2021).² Universal access to 4G-equivalent mobile internet, defined as 90 percent penetration of the population of 10 years of age and older (Broadband Commission for Sustainable Development 2019), has become even more important during the coronavirus (COVID-19) pandemic, when many, traditionally face-to-face, interactions have needed to be moved “online.” Finally, digital access can improve government transparency and accountability, although it can also have negative repercussions on data privacy and cybersecurity since many of the tools that can provide important information, give access to government programs, and enhance law enforcement are the same as those that can be used for restricting freedoms and profiling.

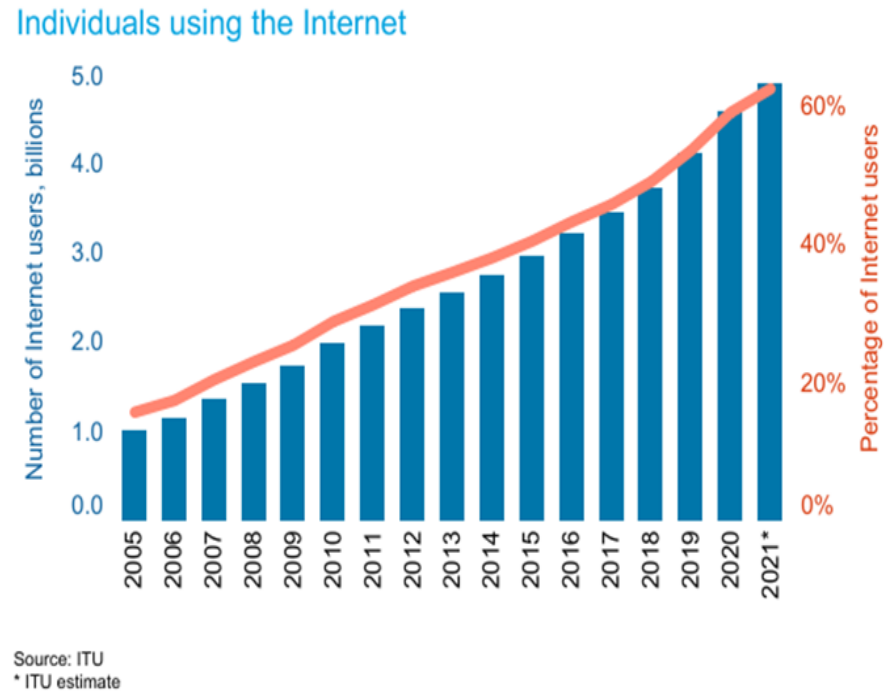
1.2 Today, at 97 percent coverage, mobile phones are the most ubiquitous technology in the world—higher than electricity (87 percent) and sanitation (between 50 percent and 70 percent, depending on definition).³ However, cell phone coverage drops substantially with newer, more reliable technologies (such as 4G or equivalent) that provide a meaningful and productive connection to the internet.⁴ Although globally, 85 percent of the population is covered by 4G or broadband network, in Africa the 4G coverage drops to 44 percent (figure 1.1, panel a). Low-income (41 percent) and small island (61 percent) countries are also lagging in availability. Further, although the number of individuals using the internet has been increasing steadily for the past 15 years (figure 1.1, panel b), and we have seen an above-trend increase of 17 percent (or 0.8 billion individuals) since the start of the COVID-19 pandemic, there are still 2.9 billion people globally who are off-line.

Figure 1.1. Coverage by Mobile Service and Internet Usage

a. Population coverage by type of mobile network, 2020^a



b. Individuals using the internet



Source: International Telecommunication Union data and estimates.

Note: CIS = Commonwealth of Independent States; ITU = International Telecommunication Union; LDC = least developed country; LLDC = landlocked developing country; SIDS = small island developing state. The Arab States region used by the ITU comprises Algeria, Bahrain, Comoros, Djibouti, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Mauritania, Morocco, Oman, Palestine, Qatar, Saudi Arabia, Somalia, Sudan, Syria, Tunisia, United Arab Emirates, Yemen

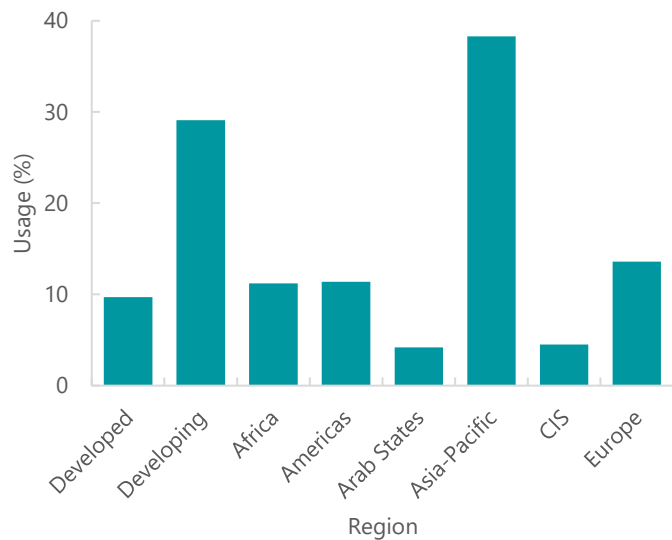
a. International Telecommunication Union estimate.

1.3 Even when a 4G or equivalent internet connection is available, it might not be used, usually for reasons of affordability (the price of connecting is prohibitive for some users) or accessibility (demand-side factors, such as lack of digital skills or capabilities to use the internet, or lack of content).⁵ This creates a usage gap (figure 1.2, panel a) that is much larger in the developing (29 percent) than the developed world. The Asia-Pacific region has a high availability of 4G (94 percent; figure 1.1, panel a), but because of affordability and accessibility issues, usage is only 56 percent, creating a nearly 40 percent gap (figure 1.2, panel a). Although the usage gap in Africa seems relatively small at 10 percent (figure 1.2, panel a), this is because of the low availability (figure 1.1, panel a) and means that only one-third of the population uses 4G or equivalent internet.

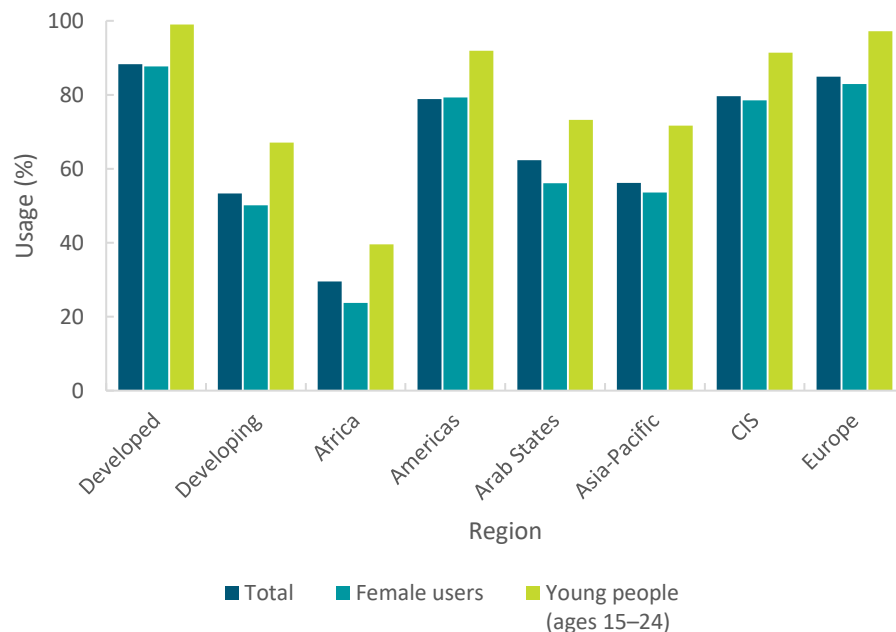
1.4 The *World Development Report 2016: Digital Dividends* (World Bank 2016) noted that although digital technologies had boosted growth, expanded opportunities, and improved service delivery, their aggregate impact had fallen short and was unevenly distributed. The *World Development Report* argued that for “technologies to benefit everyone everywhere requires closing the remaining digital divide, especially in internet access” (World Bank 2016, 2). Six years later, the “digital divide” persists. In rural areas, coverage drops to less than 70 percent, whereas a gender gap in usage is nearly universal across the developing world (figure 1.2, panel b). The highest gender discrepancy is in Africa and the Arab states—both of which experience a 12 percent gap in internet usage between male and female users.

Figure 1.2. Usage Gap and Gender and Youth Discrepancies

a. Usage gap



b. Internet usage by gender and age



Sources: Independent Evaluation Group staff calculations; International Telecommunication Union.

Note: CIS = Commonwealth of Independent States. The Arab States region used by the ITU comprises Algeria, Bahrain, Comoros, Djibouti, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Mauritania, Morocco, Oman, Palestine, Qatar, Saudi Arabia, Somalia, Sudan, Syria, Tunisia, United Arab Emirates, Yemen

The World Bank Group's Role and Contribution

1.5 The World Bank Group's technology strategies have evolved over time, retaining a priority on internet access and connectivity (appendix C). Before its first information and communication technology (ICT) strategy in 2002, the Bank Group concentrated on expanding communications infrastructure and services, with a role for the private sector in investing in infrastructure and the public sector in helping put in place appropriate regulations to promote competition and access. The 2002 ICT strategy (table C.1) reinforced these aspects with a broader mandate for the public sector to support institutional and sector reform. For the first time, it identified support for ICT applications and use in other sectors, and ICT skills. The subsequent 2012 strategy retained focus on earlier priorities but elevated the use of technology to transform the functioning of governments and service delivery, emphasizing technology applications across different sectors (World Bank 2012). It shifted focus from mobile telephony toward broadband access. It also introduced a new pillar to promote innovation and technology entrepreneurship in the private sector, which subsumed the enhancement of ICT skills.

1.6 In two Development Committee papers on disruptive technologies (World Bank 2018, 2019), the Bank Group expanded its ambition in technology and development, focusing on broader opportunities and risks from technological disruption and their implications for advancing the Sustainable Development Goals (SDGs) and twin goals. The framework emphasized the complementarity of investments in physical infrastructure and capacity and the capabilities of individuals, firms, and governments. It highlighted the need for the Bank Group to stand in the nexus of development and technology and broker partnerships among the public sector, the private sector, and global partners.

1.7 In the past decade, the Bank Group's approach to universal access has evolved and included substantial support for "first mile"⁶ submarine and terrestrial fiber optics and satellites, as well as work on universal service funds and reverse auctions to help the private sector reach rural and other less profitable "last mile" areas.⁷ The current ecosystem approach (figure C.1) to digital access and inclusion of the Digital Development Global Practice of the World Bank to a significant degree follows the multisectoral approach to technology described in the Development Committee papers. Thus, the Bank Group currently considers access in terms of use and adoption, rather than just connectivity.

1.8 The Bank Group has a substantive portfolio in digital usage and inclusion (table 1.1). We conducted a preliminary portfolio review based on sector and thematic codes (see appendix B for the identification methodology), which will be further supplemented by more extensive identification during the evaluation process (see

section 4).⁸ We identified a preliminary portfolio of 143 World Bank lending projects with a lending volume of US\$13 billion (figure B.1) and 261 nonlending operations between fiscal years (FY)11 and FY21.⁹ Sub-Saharan Africa was the Region with the most operations (52 projects) and volume (US\$3.6 billion in lending). Although most projects were in International Development Association countries (86 out of 143 operations), they were on average smaller than projects in International Bank for Reconstruction and Development countries and accounted for US\$5.9 billion, or less than half of the total lending. Within the World Bank portfolio, we identified 45 affordability-related projects (20 lending and 25 nonlending) based on their development objectives.

Table 1.1. World Bank Group Digital Inclusion Preliminary Portfolio, Fiscal Years 2011–21

Institution	Projects (no.)	Volume (US\$, millions)
World Bank lending	143	13,026
World Bank nonlending	261	—
International Finance Corporation investment services	70	2,832
International Finance Corporation advisory services	17	—
Multilateral Investment Guarantee Agency	9	1,190

Sources: Independent Evaluation Group preliminary calculations; International Finance Corporation; Multilateral Investment Guarantee Agency; World Bank.

1.9 The digital inclusion investment portfolio of the International Finance Corporation (IFC) covers 70 investments with a total commitment of US\$2.9 billion (figure B.2). The majority (two-thirds) of these investments are in International Bank for Reconstruction and Development countries, and one-third (21) are in International Development Association countries. Regional distribution is concentrated in Sub-Saharan Africa and Europe and Central Asia, with 23 investment projects in each. The digital access portfolio of the Multilateral Investment Guarantee Agency (MIGA) between FY11 and FY21 is modest, consisting of nine new infrastructure guarantees with a maximum exposure of US\$1.2 billion (figure B.3).

1.10 Two previous Independent Evaluation Group (IEG) evaluations provide context for this evaluation. *Capturing Technology for Development: An Evaluation of World Bank Group Activities in Information and Communication Technologies* (World Bank 2011) examined the impact of mobile telephony, broadband connectivity, high-speed internet access, and ICT applications and the Bank Group’s role and effectiveness in enabling these technologies. The evaluation found that the Bank Group’s role was critical in sector reforms and private investment for mobile telephony, especially in difficult and high-risk environments and the poorest countries. In other priority areas, such as ICT applications and skills development, the Bank Group’s contributions were more limited.

Notably, targeted efforts to increase access beyond what was commercially viable were also largely unsuccessful. The evaluation recommended that the Bank Group continue the shift toward supporting broadband and internet access and skills development and strengthen its capacity to respond to client demands for ICT applications, including improving project design and implementation. IEG further recommended that the Bank Group ensure that its organizational structure for ICT enables effective coordination and improves procurement outcomes for ICT projects and components. The evaluation emphasized gaps in broadband internet and diffusion of ICT in business, services, and government, which needed to be addressed.

1.11 The second IEG evaluation, *Mobilizing Technology for Development: An Assessment of World Bank Group Preparedness* (World Bank 2021a), assessed the preparedness of the Bank Group in helping clients harness the opportunities and mitigate the risks posed by disruptive and transformative technologies. It found that the Bank Group was best prepared for disruptive and transformative technologies in its traditional areas of strength, such as supporting global public goods, acting as an honest broker based on its record of neutrality in dealing with public and private sector technology initiatives and players, offering quality advisory services and analytics, and catalyzing public and private funding for innovative or foundational technology infrastructure. The Bank Group was less prepared for linking new disruptive and transformative technology diagnostics to the Bank Group's twin goals, supporting clients in education to develop skills for the new economy, having the necessary staff skills, fostering collaboration within the Bank Group on technologies that cut across sectors and involve both public and private institutions, and providing sufficient institutional culture and incentives for risk taking and innovation.

2. Purpose and Audience

2.1 The purpose of this evaluation is to assess the Bank Group's work in ensuring universal digital inclusion and usage through the availability, affordability, and accessibility of digital connectivity and to distill lessons from the Bank Group's past and ongoing experience in these areas.

2.2 The primary audience of this evaluation is the World Bank Group Board of Executive Directors and World Bank and IFC management and staff. Members of the Committee on Development Effectiveness and of the Board at large will use the evaluation to provide guidance to the Bank Group's future efforts to increase digital connectivity and usage and improve digital inclusion and skills. The evaluation will also be of particular interest to colleagues working in the Digital Development Global Practice and the Infrastructure and Disruptive Technologies and Funds industry groups of IFC, as well as MIGA staff working on digital infrastructure. In addition, colleagues

working on improving digital inclusion in other sectors across the Bank Group (for example, digital skills and affordability) might find it useful. The evaluation will also be relevant for other multilateral and bilateral agencies financing digital connectivity investments, affordability policies, e-technology and digital skills interventions, and policy and regulatory assistance for increasing digital usage. Others, such as government institutions in client countries and nongovernmental organizations, might also find it useful.

3. Evaluation Questions and Scope

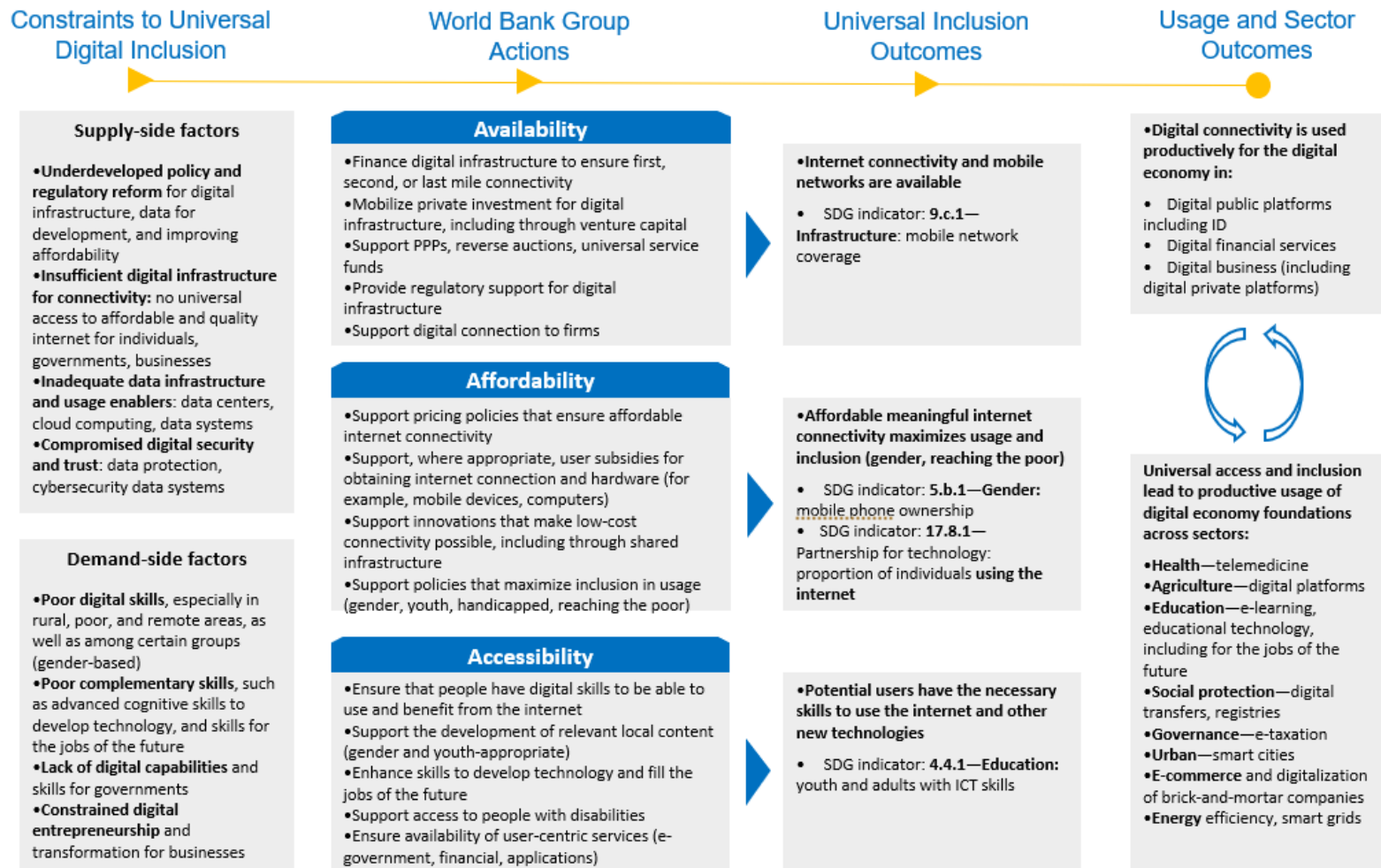
3.1 To encompass the spectrum of universal digital inclusion interventions, we focus on three binding constraints: the “three As” of *availability*, *affordability*, and *accessibility*. Availability broadly covers supply-side factors, such as the availability of mobile networks and internet connectivity (of at least 4G or equivalent networks) to users and businesses. However, as seen in figure 1.2, just having an internet connection is not enough when this connection is too expensive. Hence, affordability refers to the possibility of every user (even in the lowest income quintile) to be able to acquire internet access. Finally, even when a network is available and affordable, potential users might not have the requisite basic literacy and digital skills or relevant content to engage in a productive way.¹⁰ Accessibility has to do with such demand-side factors. Furthermore, changes in the demand for technology and skills resulting from the COVID-19 pandemic and an evolving job market will also need to be addressed.¹¹

3.2 Figure 3.1 presents the conceptual framework for the evaluation. The first column shows the constraints inhibiting universal digital usage and inclusion. They can also be viewed as containing implicit assumptions, since if they are addressed, universal digital inclusion can be achieved. For example, the lack of digital infrastructure and lack of digital skills are constraints, but the framework also assumes that if the Bank Group and its partners and clients tackle them, internet usage will increase. These factors are divided into supply- and demand-side as often these require different types of interventions and might need to be addressed by different practices within the Bank Group. For example, the Digital Development Global Practice and IFC would be at the forefront of addressing connectivity challenges (with loans and investments), whereas the Education Global Practice might tackle most digital skills challenges (at least to a degree through advisory services). The second column, hence, describes the actions that the Bank Group can take to address the challenges to digital usage and inclusion. These are divided depending on whether they pertain to availability, affordability, or accessibility challenges. Under availability, for example, the Bank Group can either finance directly or mobilize private capital for first or last mile digital infrastructure. It can also support reaching remote and rural areas, where the private sector alone would find it unprofitable to invest, through public-private partnerships, reverse auctions, or

universal service funds. It could also support digital connectivity to businesses specifically to strengthen the foundations for the digital economy. The actions under affordability and accessibility are similarly structured to cover the array of interventions the Bank Group has at its disposal to address the different constraints.

3.3 The third and fourth columns in figure 3.1 present outcomes. The framework makes the distinction between digital inclusion and usage outcomes. The usage outcomes are further separated into digital economy foundations (such as digital public platforms)¹² and sector outcomes (such as better health or higher agricultural productivity). The separation between inclusion and usage outcomes is made for convenience in conceptualizing the evaluation, as the connection need not always be linear (although available, affordable, and accessible connectivity is needed to digitally enable sectors so they can scale up).¹³ The framework does make explicit the nonlinearity between digital economy foundations (see also figure C.1) and sector usage outcomes. The evaluation considers the feedback loops that exist among these outcome levels. Nevertheless, although the flow between the different outcome levels does not need to be completely linear and could have circular elements, in many economies it does follow the direction limned in the conceptual framework. The third column further includes relevant and measurable SDG indicators that pertain to the three aspects of universal digital usage and inclusion. They cover availability of networks (SDG 9.c.1), usage (SDG 17.8.1), mobile device ownership by women (SDG 5.b.1), and ICT skills for young people and adults (SDG 4.4.1). Finally, if successful, the outcomes lead to a functioning digital economy that creates jobs (both digital and analog) and is used across sectors and to the aspirational goal of supporting the Bank Group's twin goals.

Figure 3.1. Conceptual Framework for Universal Digital Inclusion



Source: Independent Evaluation Group.

Note: ICT = information and communication technology; ID = identification; PPP = public-private partnership; SDG = Sustainable Development Goal.

3.4 The conceptual framework makes several implicit assumptions. Primary among them is that improving availability, affordability, and accessibility is a necessary and sufficient condition for increasing digital inclusion and usage. Although this assumption seems well justified based on the initial literature review and evaluability assessment conducted for this Approach Paper,¹⁴ it will be further tested during the evidence-gathering stage of the evaluation. As such, we will look at “what success looks like” in digital inclusion and usage and test the Bank Group’s monitoring in this regard. The evaluation and framework do not include some aspects of digital participation, such as software, social media and entertainment, political engagement, and free expression.

3.5 To assess the hypotheses outlined in the framework, the evaluation aims to answer the following questions:

- To what extent has the Bank Group helped achieve increased availability of digital infrastructure and connectivity in client countries?
 - This question focuses on improving digital infrastructure and connectivity, including through direct lending and investment, public-private partnerships, reverse auctions, universal service funds, and private capital mobilization.
- How well has the Bank Group supported inclusive and affordable digital access?
 - This question focuses on the affordability aspect of digital inclusion through support for policies, innovation, and (where appropriate) subsidies. As such, it also looks at the inclusion agenda relating to the SDG policy priority of leaving no one behind by addressing the gender gap and providing poor people and those with disabilities with digital connectivity.
- To what extent has the Bank Group promoted demand-side factors relating to digital accessibility?
 - This question focuses on the digital skills and capabilities of individuals and businesses to close the “usage gap” between network availability and usage in client countries. It also examines the Bank Group’s response to changes in the demand for technology and skills resulting from the COVID-19 pandemic and an evolving job market.

3.6 Some of the instruments we will look at under each question might have relevance beyond that question. For example, universal service funds affect both availability and affordability, whereas a policy framework or law can influence all three aspects.

3.7 The evaluation will cover all relevant operations and advisory services between FY11 and the end of FY22. As such, IEG will review past and current financial and nonfinancial support in digital availability, affordability, and accessibility (as defined by this Approach Paper) of the World Bank, IFC, and to a smaller degree MIGA (given the small number of projects and emphasis on availability in MIGA’s portfolio). We will also look at collaboration and the sequencing of interventions among the Bank Group institutions, given the multifaceted nature of digital inclusion, which often requires policy, technical assistance, and private investment interventions. We will also look at the COVID-19 response and its effects—both positive and negative—on digital inclusion and usage.

3.8 IEG recognizes that appropriate regulation, cross-border and domestic taxation, privacy policies, cybersurveillance, and cybersecurity are prerequisites for a meaningful digital transformation. The Bank Group’s support in these areas will be covered through review of existing documentation and the broader portfolio. Although recognizing that digital financial services are an important foundation for a functioning digital economy, the evaluation will not cover these as they were partially covered in *Mobilizing Technology for Development* (World Bank 2021a) and will be further covered in an upcoming IEG evaluation on financial inclusion. Similarly, digital identification, which was part of the *Mobilizing Technology for Development* evaluation, will not be covered. Although gaps in digital access by underserved groups (for example, poor people and women) will be examined, and existing evidence on the poverty reduction and shared prosperity impacts of Bank Group support will be documented, the evaluation will not itself undertake any new measurements of these impacts.

4. Evaluation Design and Evaluability Assessment

4.1 Based on the evaluation framework (figure 3.1), we will assess and triangulate data from both qualitative and quantitative sources. The evaluation design will include the following components: synthesis of findings from literature and document review; portfolio identification, review, and analysis; deep dives into foundational elements (infrastructure, supply policy), usage (digital skills, demand-side policies), and use sectors (agriculture, education, and so on); broader semistructured interviews with staff, experts, and clients; and desk review of a limited number of regional and country programs. The portfolio analysis and deep dives are expected to provide quantitative insights into the Bank Group’s engagement, whereas the interviews and literature and document reviews will produce mostly qualitative analysis. Although based on the initial review of literature and documents, scoping interviews, and discussions with evaluation design experts, the evaluation will not include country case studies; we envision limited travel to triangulate the findings from the deep dives and review of regional programs. Appendix A provides an evaluation matrix that maps the three

evaluation questions to the information required for answering them and to the data collection and analysis methods that we will employ to obtain this information.

4.2 Synthesis of findings from literature. IEG will commission a background paper to provide context for the Bank Group’s existing and potential role in digital inclusion. The paper will contain an overview of global trends in expanding digital coverage and usage, the different technologies used, regulatory frameworks, and the respective roles of private and public investment and service provision. The synthesis will draw on the full range of relevant sources, including inputs from development agencies (for example, the Broadband Commission for Sustainable Development) and relevant global institutions, such as the International Telecommunication Union, management consulting firms, and think tanks. It will serve to contextualize the evaluation and test causal relationships identified in the conceptual framework.

4.3 Corporate-level document review. At the corporate level, the evaluation will also conduct a review of relevant Bank Group strategies and key documents related to its evolving approach to digital inclusion and reflect on available lessons from the experiences of donors and partners with digital inclusion and usage.

4.4 Portfolio identification, review, and analysis. We will take a broad view of what constitutes the relevant portfolio in digital inclusion to cover the three aspects outlined in the conceptual framework (figure 3.1). A deepening of the portfolio identification, including trust-funded activities, pilots, partnerships, and initiatives, will be included in addition to support through traditional financing and analytic and advisory services. The evaluation will use different sources aiming to build a more comprehensive portfolio. These include Bank Group databases, using sector and thematic codes (which was the methodology used for the preliminary portfolio review for this Approach Paper; see appendix B); verification from Global Practices and IFC; and key stakeholder interviews. The evaluation team, in collaboration with IEG’s Methods Advisory Function team, will also employ machine learning (through coding, NVivo keyword searches, and systematic checks) to further identify and analyze availability, affordability, and accessibility projects across the Bank Group. The portfolio analysis will include descriptive analysis of trends, characteristics, and patterns of financial and nonfinancial support at the corporate level and at the level of the deep dives.

4.5 IEG conducted an evaluability test of the portfolio of Bank Group interventions based on 25 projects, the majority of which are World Bank lending (11) and IFC investment (10). The selection was based on a stratified sample (nonrandom) of projects, which IEG checked to verify that they yielded sufficient evidence for answering the evaluation questions. As such, most of the projects selected are closed and evaluated (19

out of 25). Overall, 24 out of 25 projects provided evidence for Bank Group's interventions in availability, 14 in affordability, and 10 in accessibility. The sample of reviewed operations was not limited to digital development and telecom and captured projects in other sectors, such as digital platforms and education. Consequently, the beneficiaries of the operations include not only mobile internet customers but also rural communities, teachers, and entrepreneurs. On the basis of these results, IEG expects that the portfolio review and analysis will provide sufficient data and evidence to be applied (and triangulated with other sources) to answering the three evaluation questions.

4.6 Sector and thematic deep dives. The deep dives will allow for a comprehensive examination of past and ongoing engagements and recent initiatives, reflecting experiences from trust-funded activities, pilots, partnerships, and innovative approaches. They will also reflect insights from partners and various stakeholders and examine the extent to which the Bank Group draws on their experiences. We will use the three A's outlined in the conceptual framework (figure 3.1) as a lens to distinguish interventions and lessons that retain relevance for the implementation of the Bank Group's approach. The deep dives will allow for a more substantive examination of Bank Group engagements, with high learning potential to provide lessons on what has worked and what has not, and will generate insights for lessons and implications. A structured review of Bank Group sector strategies, IFC and MIGA corporate strategies and work program documents, and department and regional strategies issued since 2012 will assess the extent to which they effectively incorporate digital connectivity and usage tools to support development outcomes. The selection of sectors and themes for deep dives is expected to be informed by the findings from the literature, document, and portfolio reviews (with the exception of the areas already excluded in the discussion of scope in section 3) to identify the sectors that are most relevant for digital usage (and will not cover all sectors listed in the conceptual framework). This approach will also help us distill both the intended and unintended consequences of the Bank Group's engagement in digital inclusion and usage, examine risks, and look into partnerships with other institutions.

4.7 Regional and country program desk reviews. Although the evaluation will not conduct country case studies, we are mindful of several regional and country-specific programs whose implementation offers rich lessons, both positive and negative. These include the Digital Economy for Africa and the South Asia Digital Transformation, as well as country projects such as the Niger: Smart Villages for Rural Growth and Digital Inclusion project.¹⁵ We plan to complement the findings from the desk reviews and deep dives with limited travel to triangulate our findings.

4.8 Semistructured interviews. Interviews or focus groups with task team leaders, Bank Group managers, country clients, and partners (such as private sector,

development partners, foundations and philanthropic institutions, and civil society organizations) will be conducted to obtain a deeper understanding of organizational aspects of the delivery of the Bank Group’s digital access and inclusion activities. Interviews will also be conducted with experts such as industry specialists, academics, consumer advocates, and other stakeholders to complement the findings of the synthesis report and deep dives regarding the role of the Bank Group.

4.9 Based on the listed methods, we will employ a three-pronged approach to assess the effectiveness of the Bank Group’s interventions to improve availability, affordability, and accessibility. This includes (i) an analysis of key performance indicators, (ii) systematic mapping of literature to interventions, and (iii) relating and generalizing findings from the deep dives to the portfolio. One or a combination of the three approaches will be used for each evaluation question. To answer the first evaluation question (availability), IEG will produce an analysis of key performance indicators and evidence of plausible contributions of digital connectivity projects in the portfolio. This will be supplemented by a mapping of what has worked, based on the literature synthesis, against components and objectives of Bank Group interventions. In answering the second evaluation question (affordability and inclusion), we will also rely on the content analysis of “what works” in the literature and mapping this to the Bank Group’s financial and nonfinancial support as the primary approach. In addition, we will test the generalizability of the findings from the deep dives by seeking patterns of regularity within the portfolio (the universe of affordability and inclusion projects). The answer to the third evaluation question (accessibility) will rely primarily on the third approach—exploring factors for success in the sector and thematic deep dives (and, to a degree, the regional and country program desk reviews and semistructured interviews, especially with clients) and subsequently seeking patterns of generalizability in the universe of accessibility interventions.

5. Quality Assurance Process

5.1 This evaluation will follow IEG’s standard internal quality assurance and external quality review process. The evaluation will undergo review by IEG management and external reviewers. The external reviewers, who will provide guidance and quality assurance to IEG, are Therese Turner-Jones, special adviser and former general manager of the Country Department Caribbean Group at the Inter-American Development Bank; Hans-Martin Boehmer, visiting professor at Columbia University, Georgetown University, and Duke University; and Elizabeth Stuart, executive director of digital pathways at the University of Oxford and executive director of the Pathways for Prosperity Commission on Technology and Inclusive Development.

6. Expected Outputs, Outreach, and Tracking

6.1 IEG will seek to disseminate its findings to multiple audiences to stimulate discussion and encourage an exchange of ideas. A blog and relevant materials will be posted on IEG's website, and we will also explore internal and external forums for further dissemination. The tracking of the recommendations of the report will follow the standard Management Action Record process.

7. Resources

7.1 **Timeline and budget.** IEG will prepare an evaluation report and submit it to the Committee on Development Effectiveness in May 2023. The proposed budget is US\$673,580.

Team composition. The evaluation will be prepared by an IEG team led by Soniya Carvalho and Mitko Grigorov. Gaby Loibl will provide administrative assistance. The evaluation team will also work extensively with IEG's Methods Advisory Function team to ensure that the implementation of the design is fit for purpose. The evaluation will be prepared under the supervision of Galina Sotirova (manager) and under the direction of Oscar Calvo-Gonzalez (director) and Alison Evans (Director-General, Evaluation).

¹ The International Telecommunication Union also estimates that a 10 percent drop in mobile broadband prices would boost adoption by 3.1 percent (ITU 2019).

² Increased digital connectivity has both negative and positive effects on environmental sustainability. However, the carbon emissions per additional user tend to diminish, whereas the net contributions by economic efficiencies increase. In addition, the right policies and regulations can often spur an increase in network sharing or the usage of renewables for additional connectivity (especially off-grid renewables in Africa), which further decreases the negative environmental footprint of additional digital connectivity.

³ Cell phone coverage data from the International Telecommunication Union (note that the percentage of the population covered by a mobile cell network does not necessarily equal, and is indeed less than, the percentage of people who use cell phones); electricity data from the World Bank; and sanitation data from the United Nations and the World Health Organization.

⁴ According to the Alliance for Affordable Internet, for users to benefit from the internet in a productive way, digital access at 4G or equivalent speed providing at least 1 gigabit of transfer a month at a price of 2 percent of monthly income would be necessary.

⁵ Digital capabilities usually refer to capabilities that equip one to live, learn, and work in a digital society.

⁶ The distinction between the first and last mile need not always be spatial, as the word "mile," or in some instances "kilometer," is used figuratively. The first mile refers to the initial connection

(usually large-scale fiber optic) to a country. The last mile is the final leg of a telecommunications network that delivers the services to the end users. This can be the coaxial (or other) cable that delivers service to the subscriber or the cell tower pinging the cell phones to the mobile network. Thus, the last mile connectivity is not always in rural and low-populated areas, but this is where it is usually most difficult and least profitable for the private sector to penetrate.

⁷ Universal service funds, also sometimes called universal access funds, are a system of fees and subsidies aimed at increasing access to places and users where it would not be profitable for the private market to go it alone. A small universal service fee is usually added to the bill of regular customers and used by mobile carriers to reach more remote and less populated areas.

⁸ Although the preliminary portfolio identification has not captured all operations that fall within the “three As” of availability, affordability, and accessibility, it was nonetheless sufficient for us to assess their evaluability.

⁹ The portfolio analyzed for the evaluation will be expanded to include fiscal year 2022, as indicated in the Evaluation Scope and Evaluation Design sections of the Approach Paper.

¹⁰ Further, many of them might not know of the existence, purpose, or utility of the internet. The percentage of the population not knowing what the internet is might be as high as 30 percent in some African countries, according to Research ICT Africa.

¹¹ The jobs of the future demand skills that are markedly different from those demanded by the jobs of yesterday. Twenty-first century skills include, for example, advanced cognitive skills that enable people to develop technology and socioemotional skills (such as creativity, compassion, and collaboration) that enable people to perform uniquely human tasks that machines cannot yet perform.

¹² Note that, as indicated elsewhere in this Approach Paper, although digital financial services are an essential foundational element of the digital economy (and therefore usage), they are outside of the scope of this evaluation because they will be covered in the concurrently conducted Independent Evaluation Group evaluation on financial inclusion.

¹³ A similar argument can be made about the three As to a degree. They cannot always be separated into distinct, fully independent elements of achieving universal inclusion. They influence and are influenced by each other. However, the framework separates them for the purpose of designing an evaluable paradigm.

¹⁴ As already noted, increased digital connectivity can bring about both positive and negative externalities when it comes to the environment. It can also have negative repercussions in terms of issues around data privacy, cybersecurity, restricting freedoms, and profiling. New technologies of any kind (including digital connectivity), as indicated by the 2016 *World Development Report*, can also exacerbate the “digital divide.”

¹⁵ Although the conceptual framework does not explicitly single out regions or groups of countries, it is evident from the global data, the preliminary portfolio review, and the evaluability assessment that some emphasis will be given to low-income, fragile, and International Development Association countries, which experience more significant constraints in availability, affordability, and accessibility.

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Appendix A. Evaluation Design Matrix

Table A.1 indicates the evaluation questions, the information required to answer them, and the data collection sources and analysis methods (primary and supplementary) needed to provide this information. The last column of the matrix includes the approaches for assessing effectiveness under each evaluation question.

Table A.1. Evaluation Design Matrix

Evaluation Questions	Information Required	Primary Data Collection and Analysis Methods	Secondary Sources and Analysis Methods	Approach for Assessing Effectiveness
<ul style="list-style-type: none"> To what extent has the World Bank Group helped achieve increased availability of digital infrastructure and connectivity in client countries? 	<ul style="list-style-type: none"> Information on the portfolio of digital infrastructure and connectivity projects across the Bank Group (World Bank, IFC, MIGA), including different instruments and arrangements, such as through direct lending and investment, guarantees, PPPs, reverse auctions, universal service funds, and private capital mobilization Regulatory support for digital infrastructure 	<ul style="list-style-type: none"> Portfolio review and analysis (review of infrastructure and connectivity projects) Document review of Bank Group strategies and other authorizing-environment documents Regional program desk reviews 	<ul style="list-style-type: none"> Sector and thematic deep dives Semistructured interviews with Bank Group staff 	<ul style="list-style-type: none"> Analysis of key performance indicators Systematic mapping of literature to interventions
<ul style="list-style-type: none"> How well has the Bank Group supported inclusive and affordable digital access? 	<ul style="list-style-type: none"> Information on internet affordability, including through innovations and subsidies Support for policies for digital inclusion (including addressing the gender gap and youth empowerment) Support for policies to reach poor people and rural areas 	<ul style="list-style-type: none"> Background paper on digital inclusion Portfolio review and analysis (review of DPOs and advisory services on connectivity and inclusion) Semistructured interviews with clients and other external stakeholders 	<ul style="list-style-type: none"> Regional program desk reviews Sector and thematic deep dives Regional program desk reviews 	<ul style="list-style-type: none"> Systematic mapping of literature to interventions Relating and generalizing findings from the deep dives to the portfolio

Evaluation Questions	Information Required	Primary Data Collection and Analysis Methods	Secondary Sources and Analysis Methods	Approach for Assessing Effectiveness
<ul style="list-style-type: none"> To what extent has the Bank Group promoted demand-side factors relating to digital accessibility? 	<ul style="list-style-type: none"> Digital skills and capabilities of individuals and businesses to close the “usage gap” between network availability and usage in client countries Availability of digital content (local content and gender and youth appropriate) Examination of the Bank Group response to demand-side changes resulting from the coronavirus (COVID-19) pandemic and an evolving job market 	<ul style="list-style-type: none"> Sector and thematic deep dives in education and other usage sectors Semistructured interviews with Bank Group staff 	<ul style="list-style-type: none"> Portfolio review and analysis (of education and other demand-relevant projects) Background paper on digital inclusion Regional program desk reviews 	<ul style="list-style-type: none"> Relating and generalizing findings from deep dives, regional and country program desk reviews, and semistructured interviews to the portfolio

Source: Independent Evaluation Group.

Note: DPO = development policy operation; IFC = International Finance Corporation; MIGA = Multilateral Investment Guarantee Agency; PPP = public-private partnership.

Appendix B. Preliminary Portfolio Review

World Bank operations supporting digital inclusion are delivered through both investment and development policy lending instruments. As a first step in defining the relevant portfolio in fiscal years (FY)11–21, we have preliminarily identified the information and communication technology infrastructure and services sectors with relevant themes for 143 projects (74 active and 69 closed) with a commitment volume of US\$13 billion (table B.1 and figure B.1). The preliminary World Bank portfolio selection used the information and communication technology sector identification with the following themes that are most relevant for digital access and inclusion: rural services and infrastructure, regional integration, education for the knowledge economy, e-services, infrastructure services for private sector development, other private sector development, e-government, citywide infrastructure and service delivery, urban economic development, other urban development, technology diffusion, other rural development, and Education for All.

We also identified 261 nonlending World Bank operations, using the information and communication technology sector tag and a threshold of 50 percent or more. Within the World Bank portfolio, we identified 45 affordability-related projects (20 lending and 25 nonlending). This was done by a word search followed by a manual check of the development objectives of the operations.

Table B.1. World Bank Group Digital Inclusion Preliminary Portfolio, Fiscal Years 2011–21

Institution	Projects (no.)	Volume (US\$, millions)
World Bank lending	143	13,026
World Bank nonlending	261	—
International Finance Corporation investment services ^a	70	2,832
International Finance Corporation advisory services ^b	17	—
Multilateral Investment Guarantee Agency	9	1,190

Sources: Independent Evaluation Group preliminary calculations; International Finance Corporation; Multilateral Investment Guarantee Agency; World Bank.

Note: CTT = telecom, media, technology, and venture capital.

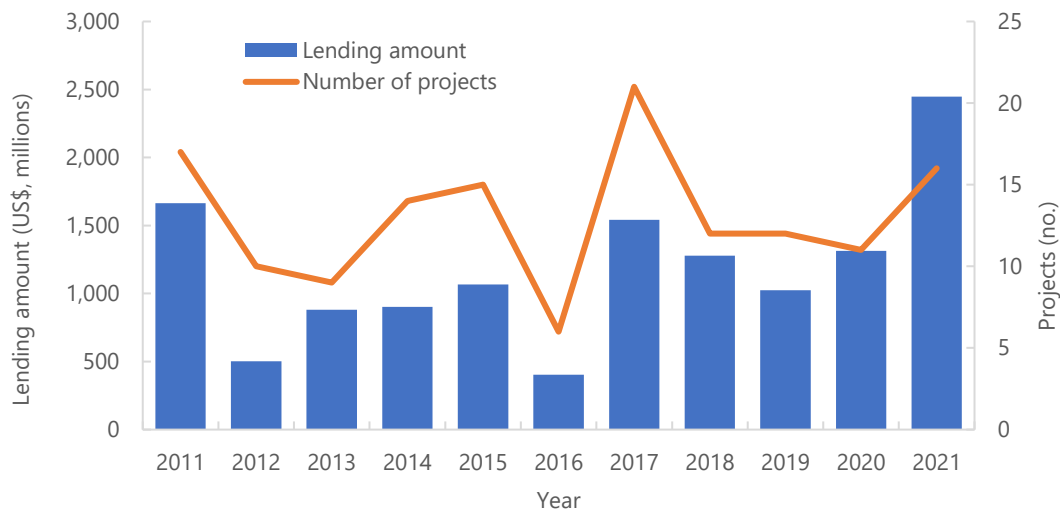
a. The preliminary International Finance Corporation investment services portfolio is based on all eligible CTT projects in telecom (based on the International Finance Corporation management information system database). Project count excludes rights issues, B loans, and swaps. Volume includes only long-term investments.

b. The preliminary International Finance Corporation advisory services portfolio is based on all eligible CTT projects in telecom. Project count includes only advisory services with clients. Project volume amounts are based on total funds managed by the International Finance Corporation.

Most of this lending was in Sub-Saharan Africa (52 projects worth US\$3.6 billion in lending). South Asia (US\$2.7 billion) and Middle East and North Africa (US\$2.6 billion) also account for substantial shares of World Bank lending volumes. At the same time, most projects were in International Development Association countries (86 operations) but worth US\$5.9 billion, or less than half of the total lending, suggesting International

Development Association operations in digital inclusion are smaller than those in International Bank for Reconstruction and Development countries. We will perform additional portfolio review to identify any missing relevant or false-positive entries. We will also capture relevant analytic work related to digital inclusion based on the same methodology applied to the lending portfolio identification and review.

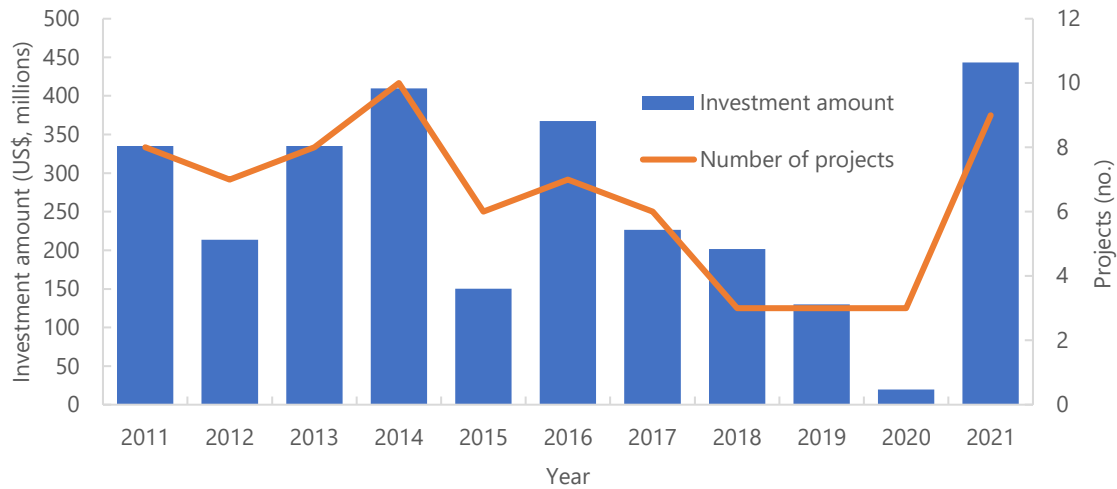
Figure B.1. World Bank Lending Portfolio



Sources: Independent Evaluation Group preliminary calculations; World Bank.

The digital inclusion investment portfolio of the International Finance Corporation (IFC) covering FY11–21 is in both the Disruptive Technologies and Funds and the Infrastructure industry groups, with the bulk of these operations (70 investments with a total commitment of US\$2.9 billion) part of the telecom sector (figure B.2). The Independent Evaluation Group will conduct further portfolio identification of collective investment vehicles and other funds industry sectors to capture additional operations that are not easily identifiable as part of industry and sector groupings. The preliminary IFC portfolio represents roughly 2 percent of the number of projects and 3 percent of commitments of all IFC long-term financing for the period. The majority (two-thirds) of these investments are in International Bank for Reconstruction and Development countries and one-third (21) are in International Development Association countries. Regional distribution is concentrated in Sub-Saharan Africa and Europe and Central Asia, with 23 investments each. Of the identified relevant investments, 10 have been evaluated by the Independent Evaluation Group. Although the bulk of the IFC portfolio is in investment services, we have identified 17 relevant advisory services related to mobile and fixed telephony, broadband, and other, such as satellite, communications.

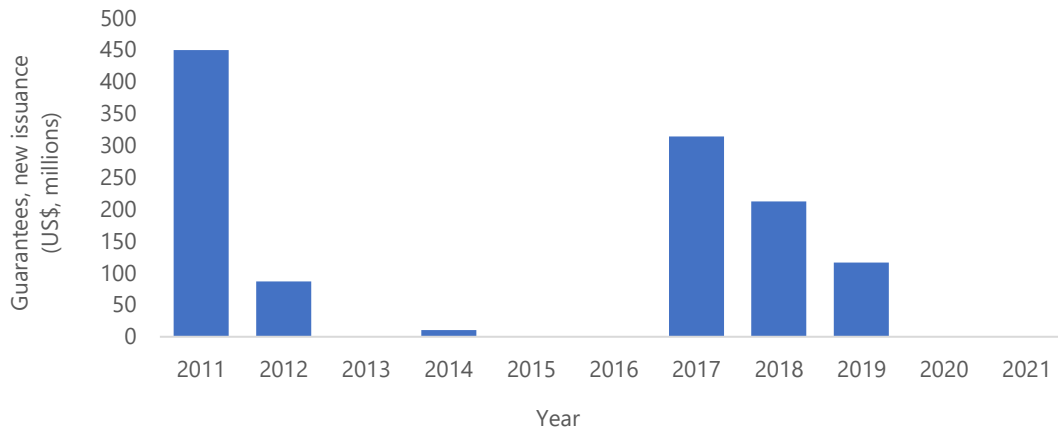
Figure B.2. International Finance Corporation Investment Portfolio



Sources: Independent Evaluation Group preliminary calculations; International Finance Corporation.

The digital usage and inclusion portfolio of the Multilateral Investment Guarantee Agency (MIGA) between FY11 and FY21 is modest, consisting of nine new infrastructure guarantees out of 151 MIGA-unique projects for the same period. We manually reviewed all MIGA projects in services and infrastructure based on project title and investor name. These eight MIGA operations had a maximum gross exposure of US\$1.19 billion out of US\$44 billion overall in the same period (figure B.3). All contracts were related to mobile tower construction or mobile network upgrades, such as Long-Term Evolution deployment or Worldwide Interoperability for Microwave Access broadband wireless upgrades, or the construction of a fiber-optic communication highway, located in Cameroon, Afghanistan, Myanmar, Sierra Leone, Indonesia, and Iraq. Three of the eight projects have been evaluated by the Independent Evaluation Group.

Figure B.3. Multilateral Investment Guarantee Agency Guarantees Portfolio



Sources: Independent Evaluation Group preliminary calculations; Multilateral Investment Guarantee Agency.

Appendix C. World Bank Group Strategies for Digital Access

The World Bank Group’s technology strategies have evolved over time, retaining a priority on internet access and connectivity. Although the Bank Group’s technology portfolio has been broad—encompassing support to science and technology, research and development and innovation—before 2018, specific strategies covering technology existed mainly for telecom and information and communication technology (ICT). However, access and digital inclusion (and technology more broadly) played a role in sectoral strategies, such as Education (2011), Fintech (2012), Sustainable Energy (2013), and Climate Change (2016).

The Bank Group’s approach before 2002 (table C.1) emphasized expanding communications infrastructure and services, with a role for the private sector in unleashing investments in infrastructure and the public sector in helping put in place appropriate regulation to promote competition and access. The 2002 ICT strategy (table C.1) reinforced these aspects with a broader mandate for the public sector to support institutional and sector reform. For the first time, it identified support for ICT applications and use in other sectors and for ICT skills. The 2012 strategy (table C.1) retained a focus on earlier priorities but elevated this emphasis on using technology to transform the functioning of governments and service delivery. It also shifted focus from mobile telephony toward broadband access, and it introduced a new pillar to promote innovation and technology entrepreneurship in the private sector, which also subsumed enhancing ICT skills.

The Bank Group’s 2018–19 approach (table C.1), articulated in two Development Committee papers on disruptive technologies (World Bank 2018, 2019), represents a marked change in the Bank Group’s ambition toward technology and development. It is more comprehensive in scope, focusing on broader opportunities and risks from technological disruption and their implications for advancing toward the Sustainable Development Goals and twin goals. It emphasizes the need for complementary investments in physical infrastructure and the capacity and capabilities of individuals, firms, and governments to harness the opportunities from technologies. Among other things, it highlights the need for broader human capital investments beyond digital skills, encompassing foundational cognitive and socioemotional skills and the implications for social safety nets and jobs. It spells out the Bank Group’s objective of becoming the “partner of choice” for governments, technology firms, and other stakeholders through thought leadership on the nexus of development and technology, and the brokering of partnerships among the public sector, private sector, and global coalitions. The World Bank’s current ecosystem approach (figure C.1) to digital access and inclusion follows this multisectoral approach to technology to a large degree.

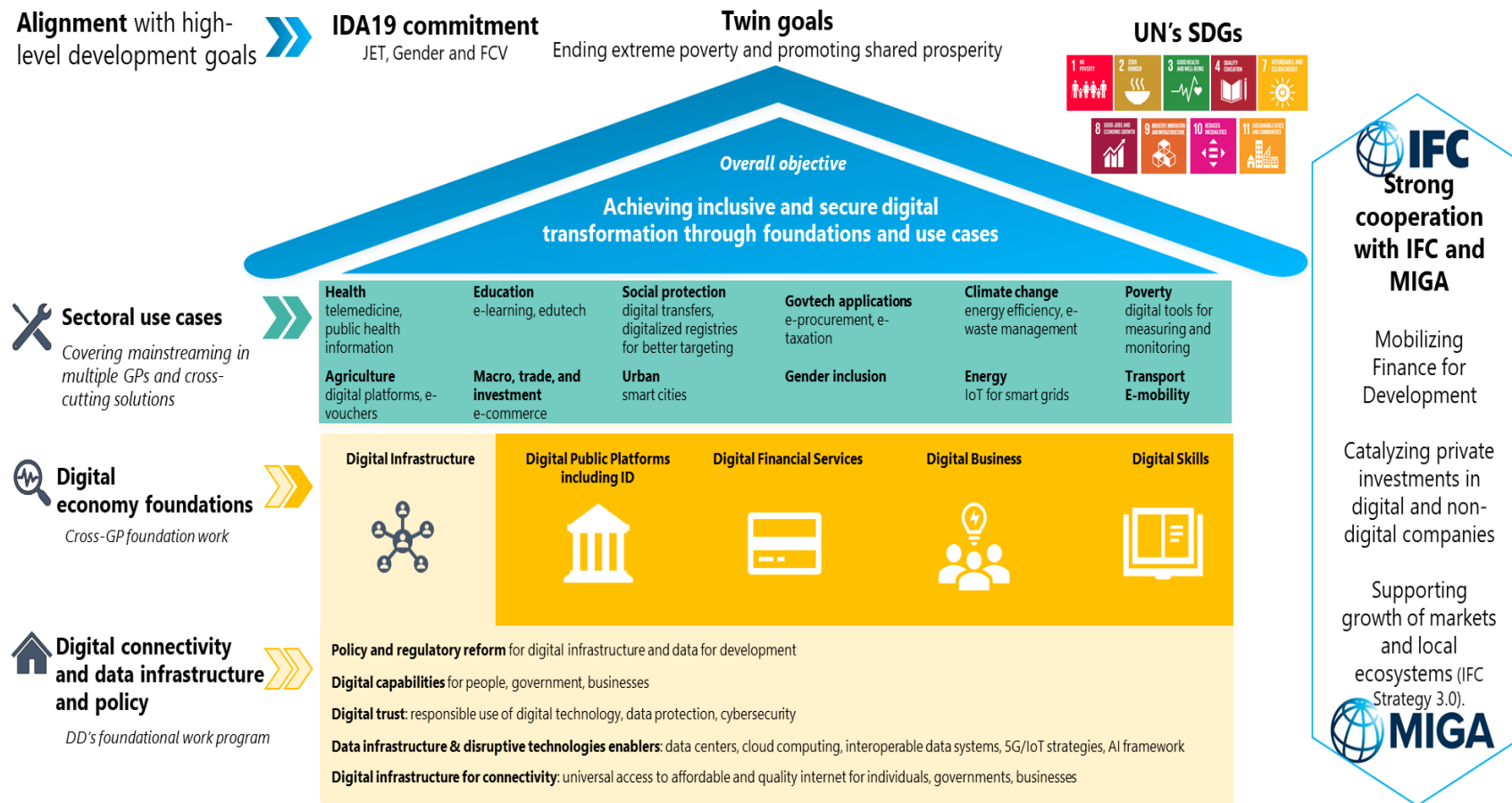
Table C.1. Bank Group Strategies for Promoting Technology

Before 2002	2002 ICT Strategy	2012–15 ICT Strategy	2018–19 Disruptive Technologies
<ul style="list-style-type: none"> • Extend communications and information networks • Expand postal network to rural regions • Expand email, internet, and tourism information services • Develop legal and regulatory frameworks • Strengthen institutional capacity • Promote private sector partnerships 	<ul style="list-style-type: none"> • Broadening and deepening sector and institutional reform • Integrated policy framework to deal with increased convergence among technologies • Legislative and regulatory changes to facilitate use of internet through e-commerce/e-government application • Sector policy reform (postal) • Increasing access to information infrastructure • Soft infrastructure development • Supporting ICT human capacity • Supporting ICT applications • Business models and information technologies in operational projects • Enhance public administration and private sector development 	<p>Transform</p> <ul style="list-style-type: none"> • Transform back-end applications for service delivery • Address cross-sector issues 	<p>Build</p> <ul style="list-style-type: none"> • Develop the foundational building blocks for sustainable, technology-led economies
		<p>Innovate</p> <ul style="list-style-type: none"> • Support growth of IT-based service industries, private sector-based technology parks, and targeted research and development 	<p>Boost</p> <ul style="list-style-type: none"> • Expand the capacity of people and institutions to thrive in a resilient society in the face of disruption
		<ul style="list-style-type: none"> • Promote mobile application development • Support knowledge sharing on early-stage development • Possible interventions: emerging technologies 	<p>Broker</p> <ul style="list-style-type: none"> • Harness disruptive technology, data, and expertise to solve development challenges and manage risks
		<p>Connect</p> <ul style="list-style-type: none"> • Stimulate demand for ICT • Increase affordable broadband access • Promote transformational broadband infrastructure 	

Sources: World Bank Digital Development Global Practice; World Bank 2018, 2019.

Note: ICT = information and communication technology; IT = information technology.

Figure C.1. World Bank Digital Ecosystem Approach



Source: World Bank Digital Development Global Practice.

Note: AI = artificial intelligence; DD = digital development; FCV = fragility, conflict, and violence; GP = Global Practice; ID = identification; IDA = International Development Association; IFC = International Finance Corporation; IoT = internet of things; JET = Jobs and Economic Transformation; MIGA = Multilateral Investment Guarantee Agency; SDG = Sustainable Development Goal; UN = United Nations.

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