



# PEOPLE'S MONEY

HARNESSING DIGITALIZATION  
TO FINANCE  
A SUSTAINABLE FUTURE

AUGUST 2020



THE UNITED NATIONS SECRETARY-GENERAL'S  
TASK FORCE ON DIGITAL FINANCING  
OF THE SUSTAINABLE DEVELOPMENT GOALS

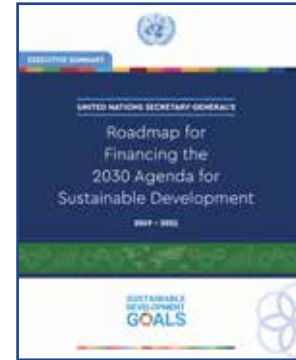
# About the Task Force

The UN Secretary General established the Task Force on Digital Financing of the Sustainable Development Goals (SDGs) as part of his broader Roadmap for Financing the 2030 Agenda for Sustainable Development: 2019-2021. The Task Force's mandate is to recommend and catalyse ways to harness digitalization in accelerating financing of the SDGs.

The Task Force's mandate, work and report are complementary to, and build on 'The Age of Digital Interdependence', that summarizes the findings and recommendations of the UN Secretary General's High-Level Panel on Digital Cooperation, and the associated Roadmap on Digital Cooperation.

The Task Force is co-Chaired by Achim Steiner and Maria Ramos. Its membership is Maiava Atalina Emma Ainuu-Enari, Henrietta H. Fore, Mats Granryd, Piyush Gupta, Natalie Jabangwe, Eric Jing, Bradley Katsuyama, Pooma Kimis, Liu Zhenmin, Phumzile Mlambo-Ngcuka, Ambareen Musa, Patrick Njoroge, Ceyla Pazarbasioglu, Richard Samans, Aurelie Adam Soule Zoumarou.

Members have been supported by their Sherpas, including Matthew Blake, Cyriaque Edon, Alix Jagueneau, Gerald Lam, Mikkel Larsen, Laurence Latimer, Lanna Lome-Ieremia, Helene Molinier, Matu Mugo, Mack Ramachandran, Shari Spiegel, Mahesh Uttamchandani, Barry Wentworth, Meng Yan and Simon Zadek.



# About the Report

'People's Money: Harnessing Digitalization to Finance a Sustainable Future' is the Task Force's final report. It summarizes the findings and recommendations developed and agreed by the Task Force since its inception in November 2018. It is based on an extensive engagement with stakeholders and research.

It builds on the Task Force's progress report, 'Harnessing Digitalization in Financing the Sustainable Development Goals', released on the occasion of the UN General Assembly in September 2019.

The report has been prepared for the Task Force by its Secretariat, including the Sherpa to the co-Chairs, Simon Zadek, and Vera Bersudskaya, Duygu Celik, Maya Forstater, Mimo He, Aiaze Mitha, and Arti Singh.



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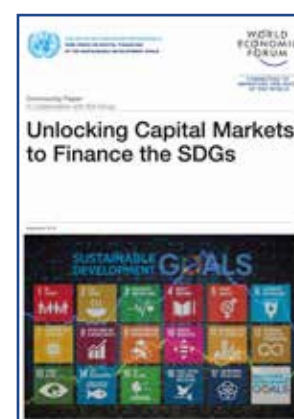
We thank Germany, Italy and Switzerland for their generous funding and support to the Task Force.

## Further Information

Information about the Task Force and downloads of this report, including action briefings for stakeholders, a summary version, an extended bibliography and related reports can be accessed at [www.digitalfinancingtaskforce.org](http://www.digitalfinancingtaskforce.org).

Task Force members have participated in a personal capacity and are not expressing endorsements or commitments on behalf of their institutions

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## LETTER FROM THE CO-CHAIRS

We must think to the future, even amidst our efforts to deal with the tragedy, turmoil, and uncertainties thrust upon us during the current crisis. Digital has proved to be a keystone in our handling of the crisis and will certainly emerge as a more important part of our collective futures.

With foresight, and fortuitously given today's context, the UN Secretary General mandated a task force to recommend how best to harness the forces of digitalization in accelerating financing of the Sustainable Development Goals (SDGs).

We are honoured to have been invited to co-Chair this task force, given both the importance of its mandate, and the exceptional leaders drawn to its ambitious goals from governments and regulators, financial, technology and international development communities.

The nexus between digitalization, finance and the SDGs is largely a new frontier of investigation and action. Fulfilling our mandate has therefore required us to catalyse a knowledge ecosystem and a community of practice, as much as making recommendations.

Core to the conclusions of the task force is that digitalization amplifies the potential for the financial system to better serve the interests of people, whose money it manages, and whose collective interest is expressed by the SDGs.

Our Action Agenda, we believe, offers an ambitious yet resolutely practical pathway for realising this potential, and closing the gap in financing the transition to an inclusive, sustainable development.

In conclusion, we would like to thank the UN Secretary General for the opportunity to play a role in advancing his broader strategy for financing the SDGs, and to thank the members of the Task Force for their extensive contributions, insights and conclusions reflected in this final report.



Achim Steiner



Maria Ramos



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# EXECUTIVE SUMMARY

**Digitalization can propel us towards achieving the Sustainable Development Goals, (SDGs).** Our response to today's unprecedented crisis demonstrates how digitalization can be harnessed to support vulnerable people, reduce inequalities, sustain livelihoods and strengthen solidarity. If unchecked, however, it could deepen exclusion, increase inequality and further divide us.

**Digital disruption creates an historic opportunity to reshape finance.** Mobile platforms and data analytics are bringing sophisticated financial services to mass markets. Tens of millions of businesses depend on more than 2 billion people spending trillions of dollars annually online. Governments are digitalizing public finance, and a growing portion of the world's public equities trades are executed by computer-managed funds.

**Digitalization can have a transformative impact by empowering people in financing.** The Task Force has focused on how digitalization can support financing that meets the priorities of the people it is intended to serve, by empowering them as savers, lenders, borrowers, investors, and taxpayers. These priorities are collectively represented by the SDGs, the shared agenda adopted by all United Nations Member States.

**Catalytic opportunities can harness digitalization in aligning finance with the SDGs.** The Task Force highlights that digitalization is already making a difference, but that far more can be achieved by realising keystone, catalytic opportunities. Notable is accelerating the use of domestic savings for long-term development, enhancing accountability of public financing, making SDGs count in global financial markets, financing small and medium enterprises, and promoting SDG-aligned consumer spending.

**Barriers and digital risks need to be overcome** in harnessing digitalization's potential in financing the SDGs, with barriers including inadequate digital infrastructure, and access, affordability and capabilities, and digital risks such as gender and minority biases, increased short-termism, cyber vulnerability, and market concentration.

**Governance innovations are pre-conditions** for harnessing digitalization in delivering financing of the SDGs. Regulations and standards governing digital financing need to be informed by SDG commitments and goals, with a particular need to ensure that the SDGs inform the governance of a new generation of global digital financing platforms with cross-border, spillover impacts.

**The UN can play a key role in realizing opportunities, overcoming barriers and mitigating risks** in harnessing digitalization in financing the SDGs. Centrally is support to Member States in realizing catalytic opportunities, aligning digitalized finance ecosystems with the SDGs, progressing governance innovations to mitigate risks, and advancing digital financing in the UN.

**The historic opportunity to harness digitalization in reshaping finance must be grasped now,** given the urgency to finance the SDGs, the short window of change resulting from a period of digital disruption, and the potential to maintain the digital momentum of the current crisis.

The background of the entire page is a vibrant green color. It is overlaid with a complex network diagram consisting of numerous small, light-colored circular nodes connected by thin, light-colored lines. In the upper-middle section, a larger, more prominent node is highlighted with a thick, dark green border and contains the white number '1'. This node is connected to several other nodes, some of which are also highlighted with thick, dark green borders. The overall aesthetic is clean, modern, and tech-oriented.

# SECTION 1

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# INTRODUCTION



## AN HISTORIC OPPORTUNITY

***Digitalization is transforming finance, enabling services and markets to be automated, commoditized and customized.*** Tens of millions of businesses, particularly smaller enterprises, depend on digital markets, with an estimated 1.9 billion people worldwide purchasing goods online,<sup>2</sup> amounting to US\$3.5 trillion of sales in 2019.<sup>3</sup> Objects are increasingly digitally connected, enabling them to respond to their context, and to relate to each other in shaping integrated functions and networked intelligence. Mobile platforms and data analytics are bringing sophisticated financial services to mass markets.<sup>4</sup> Governments are digitalizing public finance,<sup>5</sup> whilst a third of US public equities trades are executed by computer-managed funds.<sup>6</sup> Fintech-powered start-ups, financial service providers, and ecommerce, social media and search platforms are all part of the disruptive wave.<sup>7</sup>

***The Task Force has focused on how digitalization can support financing that meets the priorities of people it is intended to serve.*** The Sustainable Development Goals (SDGs) are a global, shared agenda for achieving peace and inclusive, sustainable prosperity by 2030. The SDGs have been adopted by all United Nations Member States as part of the core of the 2030 Agenda for Sustainable Development. As such they represent the collective priorities of the world's citizens.<sup>a</sup>

Citizens are the ultimate owners of the world's income and wealth. Tens of billions of decisions everyday determine what and how we produce and consume, today and into the future. In principle, citizens' US\$130 billion in daily purchases should reflect their informed choices.<sup>9</sup> Governments' daily global spending of US\$85 billion should reflect how



***“Digital technologies are rapidly transforming society, simultaneously allowing for unprecedented advances in the human condition and giving rise to profound new challenges.”***

UN Secretary-General's High-Level Panel on Digital Cooperation<sup>1</sup>

<sup>a</sup> Throughout the report, the word “citizens” refers to the world’s citizens and therefore does not exclude migrants or stateless persons.



*"[there is an urgent need to] return the financial services industry to what it is supposed to be - an industry that serves people."*

Kristalina Georgieva,  
Managing Director,  
International Monetary Fund<sup>8</sup>

citizens want their money to be used.<sup>10</sup> The allocation of US\$382 trillion<sup>11</sup> of assets managed by financial institutions and channelled through today's global financial and capital markets should be guided by citizens' preferences.<sup>12</sup>

***The world is awash with finance, but it is not aligned with these priorities, due to gaps, weaknesses and distortions in institutions and markets.***<sup>13</sup> Since the Global Financial Crisis of 2008, financial services are less trusted 'to do what is right' than any other part of the business community,<sup>14</sup> although most people trust banks to safeguard their money and their data.<sup>15</sup> Most citizens distrust how governments use their money. Over half (57 percent) of the respondents of a multi-country survey say

governments serve the interest of the few, while less than a third (30 percent) say that governments serve the interests of everyone.<sup>16</sup> Citizens spending behaviours too often do not reflect their concerns about their children's futures, inequality, environment and climate.<sup>17 18</sup>

***Digitalization offers an historic opportunity to overcome these shortfalls, gaps and weaknesses in aligning a new generation of financing instruments, markets and institutional arrangements with the SDGs.***<sup>19</sup> Digitalization of finance is essential in the fight against organized crime, a US\$4 trillion global business which destroys value for the private and public sectors, and society itself.<sup>20</sup> Digitalization can improve tax collection and make public financial management more effective and transparent.<sup>21</sup> Cheap, credible data is a pre-requisite in growing the multi-trillion-dollar market for green and sustainable 'use of proceeds' bonds, and in integrating climate risk into the world's financial and capital markets.<sup>22</sup>

***Today's unprecedented crisis has made digitalization far more important.*** Digital finance has become a critical lifeline during the crisis for billions of people. Innovations and investments have underpinned rapid scaling of support to vulnerable groups, from extending the reach of social safety nets and health systems to new ways to secure digital livelihoods and undertake mutual support within families and communities.<sup>23</sup>

Governments are using digital payment platforms to operationalize social safety nets and extend the reach and effectiveness of health systems. Businesses are depending on ecommerce for their continued existence. People are reaching for the digital world to communicate with their families and friends, to buy what they need, and where possible to continue their work and livelihoods.

The move to conduct business, entertainment, education, health and other public services online is being accelerated. Digital financing will make social safety nets involving cash transfers easier and cheaper to manage. Public and philanthropic efforts to support those in need have also turned to the world of digital financing, leveraging crowdsourcing to raise funds and target transfer payments to support people in need.

This surge in the digital world amplifies the opportunity and the need for it to be harnessed in the longer-term pursuit, and financing, of sustainable development.

**Barriers could restrict the realization of digital financing's potential.** Physical exclusion is the most obvious barrier. There are still 750 million people who remain unserved by mobile data networks.<sup>24</sup> A further 3.3 billion people lack adequate resources and capabilities to take advantage of the digital world.<sup>25</sup> Women, youth and other disadvantaged groups are more reliant on unregulated informal financial services and have less access to economic opportunities.<sup>26</sup> Resistance to digitally-enabled market entrants can restrict innovation which would reduce costs and enable more people to be reached. Governments can be unwilling or unable to improve targeting and transparency of public financing even where the technology makes it possible. Many developing countries struggle to make use of the power of data in driving better economic decision-making.

**Digitalization also introduces new risks which may further divorce finance from people's needs.**

Digitalization opens new routes for embezzlement and fraud and provides ways to hide illicit financial flows.<sup>27</sup> Cybersecurity threats increase.<sup>28</sup> Biases in algorithms or underlying data sets may reproduce discrimination.<sup>29</sup> Digitalization may increase short-termism in financial markets.<sup>30</sup> Digitalization increases the likelihood of a new generation of highly concentrated financial markets because of its tendency to provide ever-increasing benefits to scale. It may reduce an autonomous economic policy space through the loss of control over macroeconomic and monetary policy.<sup>31</sup>

**Repurposing finance to serve citizens in supporting inclusive sustainable development requires smart and purposeful market and governance innovations.**

Digitalization can enable financial products to take better account of sustainable development risks and opportunities. Market actors, both existing and new, play a critical role in developing financial products that take the SDGs into account, both in terms of environmental and social risks and positive impacts that customers and users care about. Governance innovations will be needed to incentivize and, where necessary, require these developments, as well as mitigate risks from digitalization itself.

**There is a short-lived window of opportunity to achieve systemic change.** Catalysing major change becomes possible during critical junctures of disruption. The opportunity arises when historic circumstances converge to create the perfect storm upsetting the status quo and opening routes to create something a better alternative. Peoples' actions, rather than technology or fate, determine the outcome of these moments. The nexus of finance, digitalization and the transition to an inclusive sustainable development is a case in point.

**Failure to act would be a wasted opportunity and risk finance's divergence from the needs of citizens for an inclusive, sustainable development.** Acting with purpose and ambition, on the other hand, opens the possibility of overcoming barriers to securing financing for the SDGs, whilst mitigating risks associated with digitalization of finance.



**This historic opportunity combined with this unprecedented crisis provides a unique moment and imperative to act in harnessing digitalization to accelerate financing of the SDGs.**





# THE TASK FORCE AND THIS REPORT

The UN Secretary-General established the Task Force on Digital Financing of the Sustainable Development Goals in November 2018 with a mandate to recommend and catalyse ways to harness digitalization in accelerating financing of the SDGs.<sup>33</sup> The Task Force's focus as set out in its Framework document was to develop practical recommendations for the short to medium-term (1-5 years).<sup>34</sup>

***'People's Money: Harnessing Digitalization to Finance a Sustainable Future' is the Task Force's final report.*** It highlights the potential for digitalization to catalyse a fundamental realignment of both public and private finance with the SDGs. The Task Force offers analysis of current developments and recommendations for action to establish a financial system that advances citizens' interests. The Task Force has catalysed a portfolio of pathfinder initiatives that exemplify ambitious action in implementing the recommendations.

The Task Force is complementary to the outcomes of the UN Secretary-General's High-Level Panel on Digital Cooperation (HLP),<sup>35</sup> and draws on the broader body of work developed as part of the UN Financing for Sustainable Development.<sup>36</sup>

## Exhibit 1: Who is the Task Force?

The Task Force comprises seventeen leaders drawn from the financial, technology, policy, regulatory and international development communities. Maria Ramos, until recently the CEO of Absa Holding of South Africa, and Achim Steiner, the Administrator of the United Nations Development Programme (UNDP) are Co-Chairs.

The Task Force is co-hosted by the United Nations Development Programme (UNDP) and the UN Capital Development Fund (UNCDF).

Knowledge partners include the Accenture Development Partnerships,<sup>32</sup> the Green Digital Finance Alliance and Refinitiv.

<https://digitalfinancingtaskforce.org/the-task-force/>

In addressing its mandate, the Task Force addressed five core questions, as shown in Exhibit 2.

## Exhibit 2: The Task Force's Mandate, Goals and Core Questions



### ***The Task Force has commissioned and produced a series of working papers and reports:***

- Progress report released by the co-Chairs on the occasion of the UN General Assembly in September 2019, shared initial findings.<sup>37</sup>
- Technical reports prepared by Task Force members, including one on gender and digital finance,<sup>38</sup> and one on digitalization and capital markets.<sup>39</sup>

***The Task Force has helped to shape a knowledge ecosystem about the nexus of digitalization, finance, and sustainable development.*** Over 18 months, the Task Force has convened around the world, engaging with hundreds of financial institutions, dozens of governments and regulators, as well as many civil society organizations, think tanks and expert groups. It has taken into account hundreds of papers, proposals and research pieces. This includes the rich fruits of the call for contributions, convenings in Amsterdam, Beijing, Berlin, Brussels, Davos, Geneva, Kuala Lumpur, London, Milan, Mumbai, Nairobi, New Delhi, New York, Paris, Singapore and Toronto,<sup>40</sup> and numerous engagements with Task Force members, partners and supporters. Part of this engagement included co-sponsorship with the Central Bank of Kenya of a Hackcelerator on fintech and the SDGs,<sup>41</sup> and a 'Digital Finance for Sustainable Development Goals Challenge' led by the United Nations Capital Development Fund (UNCDF).<sup>42</sup>

The stand-alone bibliography released alongside its final report is testimony to the work of many and the growing importance of the field.

This final report is organized in three main sections:

- ***Section 1 sets out the reasons for, composition of, and approach to the work of the Task Force.***
- ***Section 2 maps the world of digital financing and its current relationship with the SDGs,*** providing an analytic framework for the overall work, highlighting major developments in digital financing, and mapping progress in harnessing digitalization in financing the SDGs, along with associated barriers and risks.
- ***Section 3 lays out the Action Agenda*** for a catalytic process for realising key market opportunities and securing the underlying institutional and market conditions.

A network diagram with a large number 2 in a circle, surrounded by smaller circles and lines, set against a background of orange and yellow squares and lines.

2

## SECTION 2

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# DIGITAL FINANCING OF THE SDGS



# DIGITALIZATION AND FINANCE

## 3.1 ERA OF DIGITALIZATION

***The long wave of digitalization is changing the fundamentals of how we live.*** Today, over half the world's population is online, a one hundred-fold increase since 1990.<sup>43</sup> It is said that 90 percent of the world's data is created every two years, implying a 10-fold increase in data every two years.<sup>44</sup> Identities are formed, relationships maintained, and goods and services transacted online.<sup>45</sup> Tens of millions of businesses depend on digital markets, with an estimated 1.9 billion people purchasing goods online in 2019.<sup>46</sup>

***In this era of digitalization data is the lifeblood of automated decision-making and innovation.***<sup>47</sup> Massive amounts of data can increasingly be stored, shared and analysed cheaply, making it accessible, intelligible and valuable.<sup>48</sup> Artificial intelligence enables more sophisticated targeting, design, and customization of all kinds of products and services.<sup>49</sup> Application Program Interfaces (APIs) allow different companies' software to interact automatically.<sup>50</sup> Digitalization enables innovative solutions in education, energy, agriculture and land use, transportation and other sectors.<sup>51</sup>



***By 2025, 463 exabytes of data will be created each day globally - that's the equivalent of 200 million individual DVDs per day.***<sup>52</sup>

***Digital identity systems are particularly important for people to be able to operate in this world.***

Like passports, they authenticate and validate a person's unique identity.<sup>53</sup> Almost half of the world's population, about 3.2 billion people already have some form of ID able to be used online.<sup>54</sup> This is expected to rise to 5 billion by 2024.<sup>55</sup> Whilst many digital IDs are issued by national or local governments, such as India's Aadhaar<sup>56</sup> and Estonia's e-ID,<sup>57</sup> many others are issued by commercial or non-profit organizations, from the two plus billions of Facebook-registered users through to Sweden's BankID,<sup>58</sup> Belgian Itsme,<sup>59</sup> or MOSIP.<sup>60</sup> Financial institutions have said that by relying on the Aadhaar tech stack, account opening costs have decreased by over 40% and opening an account has become instant instead of taking three days to approve.<sup>61</sup>



***Digitalization reshapes the transition to sustainable development.*** Most obviously, it opens the possibility of accelerating the ‘dematerialisation’ of the economy, with associated environmental benefits, increased access and reduced costs. Digitalization could help reduce global carbon emissions by 15 percent through innovative solutions in energy, agriculture and land use, and transportation.<sup>62</sup> The Carbon Trust in collaboration with the mobile operators’ association GSMA estimates that mobile technologies may enable emission reductions in other sectors that are ten times greater than the direct emissions related to the technology itself.<sup>63</sup> Nevertheless, there is still a challenge to control energy use and impacts.

Digitalization allows many economic activities to go online; services to substitute for physical goods, small and medium-sized enterprises to access world markets, and materials to be more effectively tracked in order to be reused and recycled. Health and education services can be digitalized, with reduced costs and with distance from major urban centres becoming less of a barrier to access. Infrastructure becomes smarter, from buildings that can use less energy and clean and recycle water, to transport systems that are more flexible and less polluting. Digitalization enables physical assets to be shared and more intensively used, such as cars, roads and homes but also clothes, equipment and even food.

## Exhibit 3: Core Definitions

***Digital financing*** is broadly defined as financial services delivered through digital processes and infrastructure.

***Digitalization*** is the integration of digital technologies into everyday life, changing the way that we interact and live.

***Digitalization of finance*** comprises the systemic changes to the financial system, aided by technology including changes in business models, products and services.

***Digitization*** is the shift from paper to digital format and the shift from manual to automated processes.

***Financing*** includes processes of buying and selling, taxation, procurement, contracting, saving, credit, investment, and insurance, through both public institutions and private intermediaries.

NB: A full glossary is included on page 85.

## 3.2 FUNDAMENTALS OF DIGITAL FINANCING

Digital financing is broadly defined as financial services delivered through digital processes and infrastructure. There are three core features of digital financing:

- **Availability of more, cheaper, readily accessible and more trustworthy data.**<sup>64</sup> When data is shared, linked and combined across boundaries, and analysed using machine learning and artificial intelligence it enables targeted pricing and risk analysis, which unlocks new insights and possibilities. More and better data enables product-personalization and service innovation.<sup>65</sup>
- **Radical reduction in the cost of financial intermediation.** Digitalization, driven by market innovators, sets up a chain reaction of disruption, powered by ever-cheaper and faster computing. Digitalization allows financial value chains to be unbundled into separate components, enabling low-cost, automated customization of everything from payment processors to point of sale machines to billing and invoice management, cashflow and liquidity management, bookkeeping and payroll management, lending, equity, invoice financing and insurance.<sup>66</sup>
- **Innovation in financial products, enterprises and markets.** Digitalization enables new business models, such as cryptocurrencies and crypto-assets, peer-to-peer lending, crowdfunding platforms, online marketplaces and aggregators, smart-devices linked or index-based insurance.<sup>67</sup> These are not just cheaper ways of doing existing things, they offer new ways of bringing together hitherto fractionalized interests in financing decisions – such as by local communities, young people, parents and other interest-based groups.

These core features are driving the practice of digital financing, and its potential to make a difference.

**The transformational opportunity from digitalization is to enable evolution from financial inclusion to citizen-centric finance.** Citizens care about far more than financial returns, with those wider concerns collectively expressed in the SDGs.<sup>68</sup> Digitalization can help citizens in directing the use of their money more effectively to realize their financial and non-financial goals, by delivering the right information, improved access, greater accountability and smarter financial services.<sup>69</sup>

## Exhibit 4: Citizens and digital financing of the SDGs



Greater citizen engagement in financial decision-making can be as individuals, for example consumers, savers and investors, and as pension and insurance policy holders. However, this does not mean that digital finance's impact is solely driven by the atomized decisions of 7.5 billion people acting as consumers and individual savers and investors. Rather it concerns all of the myriad ways that people organize collectively, at family, community and city level, through trade unions, religious groups, community and identity groups, and through political processes and oversight. Citizen-centric finance concerns the effective aggregation of influence through these many channels and the way that they can shape and channel financial flows through different intermediaries.

### 3.3 DIGITAL FINANCING TODAY

**Digital infrastructure and digitalization impact every aspect of finance, starting with access, availability and affordability.** Mobile payment platforms have turned mobile phones into interfaces with the financial system and are now used by over 1 billion people.<sup>70</sup> In 2017, 69 percent of adults had an account with a financial institution, up by seven percentage points since 2014.<sup>71</sup> In many countries in Sub-Saharan Africa, over 60 percent of the adult population have a mobile money account.<sup>72</sup> Digital payments systems in developing countries have often involved new distribution models (through networks of agents,<sup>73</sup> and stable connectivity and power supply for them<sup>74</sup>) and improved interoperability so that users of different platforms and systems can make seamless transfers that are as good as cash.<sup>75</sup> For example, MTN and Orange, with the support of GSMA have developed Mowali, a system to enable interoperable transfers across Africa.<sup>76</sup>

**Digitalization has catalysed changes in existing banking systems.** Digital identity and online account opening reduces bank account opening costs dramatically.<sup>77</sup> Mobile payment systems have required changes in interbank clearing systems.<sup>78</sup> A growing number of countries in Asia, Latin America, Europe and the US have implemented fast payment systems that make funds available instantly.<sup>79</sup> Fourteen banks, including UBS, Barclays, Banco Santander, Credit Suisse, HSBC, Deutsche Bank, have invested over US\$63 million in the most ambitious blockchain-based utility settlement coin 'Finality' to make clearing and settlement more efficient.<sup>80</sup> Central banks including Canada, China, Sweden, and Uruguay are seriously considering offering central bank digital currencies, and several have moved on from research to piloting.<sup>81</sup> Banks are also using AI and advanced analytics to assess credit risk more effectively and extend credit to more borrowers.<sup>82</sup>

**Digitalization has the potential to enable every nut and bolt of financial processes to be unbundled and commoditized,** including budgeting and financial planning, payment processing, point of sale machines, billing and invoice management, cashflow and liquidity management, invoicing, bookkeeping and payroll management.<sup>83</sup> Digitalization has allowed processes and products to be redesigned for cross-border remittances, banking, foreign exchange services, retirement management tools, investment advice and management, stock broking, spread-betting, banking and lending, and loan broker services.<sup>84</sup> Digital innovations enable new business models such as financing models, cryptocurrencies and crypto-assets, peer-to-peer lending, crowdfunding platforms, online marketplaces and aggregators, smart-devices linked and index-based insurance.

Noisy stock exchange floors are being replaced by algorithmic traders. One estimate suggests that 90 percent of equity-futures trades and 80 percent of cash-equity trades in the US are executed without any human input.<sup>85</sup> Over a third (35 percent) of US public equities is run by computer-managed funds, with funds with human managers now accounting for only 24 percent.<sup>86</sup> The conversion of financial assets into digital tokens could further transform the clearing and settlement of securities trades.<sup>87</sup>

The coronavirus has triggered an unprecedented twin global health and economic crisis. With millions confined in their homes, the importance of the digital world has grown. Digital financing solutions have been used to provide social safety nets, maintain liquidity and ease financial pressure on businesses.<sup>88</sup>

## Exhibit 5: Digital Financing and COVID-19

- **Digital money transfers** are enabling governments and individuals to provide immediate support to people. Concern about physical transmission of the virus on banknotes is accelerating the shift to digital payments, which risks excluding the unbanked.<sup>89</sup>
- **Digital financing support to SMEs** includes emergency collateral-free digital loans and digital processing of trade financing.<sup>90 91 92</sup> In China, Ant Group partnered with over 100 banks to launch the Contactless Loans initiative to support SMEs to recover from Covid-19. It is using blockchain-powered supply chain finance to enable SMEs to apply for loans from banks based on their receivables from large enterprises.

**Crowdfunding platforms** are raising funds for medical supplies and emergency relief.<sup>93</sup> Yelp, a business directory with crowdsourced reviews,<sup>94</sup> and Intuit QuickBooks<sup>95</sup> partnered with GoFundMe to allow businesses affected by the Covid-19 launch fundraisers and accept donations. Ecommerce platforms have been developed that sell goods locally for immediate or future consumption.<sup>96</sup>

- **Innovative digital insurance products** are being launched to provide coverage for those affected by coronavirus. WeSure, the insurance arm of Tencent developed insurance products including free Covid-19 insurance for Chinese citizens under 65.<sup>97 98</sup> Riskcovry, a Mumbai-based start-up, introduced coronavirus insurance in-a-box solution for businesses that want to offer hospitalization and lost wages coverage.<sup>99</sup>
- **Fiscal transparency** will play an important role in ensuring government accountability for spending on crisis response and recovery. Portals like Recovery.gov and or Fuerza Mexico<sup>100</sup> that tracked relief and reconstruction activities following 2017 earthquake in Mexico can serve as models and provide lessons.





***Digitalization is changing the financial sector and bringing in new players.*** Many existing financial institutions have digitalized their services through acquisition, in-house development, outsourcing and partnerships. Banks have invested over US\$1 trillion in developing, integrating and acquiring emerging technologies.<sup>101</sup> Mainstream financial institutions are developing digital first services, including for underserved clients and new markets.<sup>102</sup> There is an increasing trend towards open source initiatives in the financial industry. Open source projects and shared standards allow interoperability and open innovation rather than tying companies into proprietary technology and locking data into incompatible formats.<sup>103</sup>

Mobile operators and new innovators have become key players. In 2018, 'fintech' investment hit a record high US\$120 billion,<sup>104</sup> representing about a third of global venture capital funding.<sup>105</sup> Meanwhile, fintech and telecom companies are also acquiring banks, such as Lending Club's recent purchase of Radius Bank<sup>106</sup> and Telenor's acquisition of Tameer.<sup>107</sup>

To date, the relationship between incumbent financial institutions and innovative start-up firms appears to be largely complementary. Partnering allows fintech firms to viably operate while still being relatively small and benefitting from access to incumbents' client base. Incumbents benefit from access to innovative technologies.<sup>108</sup> For example, BBVA Bancomer in Mexico has run pilots with fintech startups through their open sandbox project to test new types of data for alternative credit scoring, and to drive customer engagement through automated SMS messaging.<sup>109</sup>

***Digital retailers and social media platforms are moving into financial services.***<sup>110</sup> They are able to amass large volumes of data, which allows them to offer highly relevant, personalized financial services directly or in partnership with traditional financial companies. Ant Group, a related company of the Alibaba Group has launched services including mobile wallets, savings accounts, personal investing, lending, and credit scoring serving 900 million people in China, by partnering with financial institutions. Its Yu'e Bao cash management platform uses liquidity prediction and management technology to help fund managers plan and execute investment strategies.<sup>111</sup>

Other established tech giants are also increasingly venturing into financial services. Apple has moved from 'Apple Pay' mobile payment services to providing credit through 'Apple card',<sup>112</sup> online retailers undertake small business lending.<sup>113</sup> Facebook is consolidating its payment products under a new brand Facebook Pay<sup>114</sup> in addition to developing a global cryptocurrency Libra,<sup>115</sup> which will use Facebook's digital identification infrastructure.<sup>116</sup> Google is planning to expand into banking.<sup>117</sup> Ride hailing platforms such as Grab<sup>118</sup> and Uber<sup>119</sup> are moving into financial services, including offering credit lines and insurance products to drivers.

***In public finance governments are making investments to digitalize their financial systems.***

This goes beyond government IT systems to developing interoperability between public and private sector information systems, mandating digital identification, and undertaking digital (financial) literacy education.<sup>120</sup> The Government of Benin, for example, is working with Estonia's IT solutions provider to roll out a secure, interoperable data exchange platform to facilitate digital service delivery.<sup>121</sup> Digitalization has boosted efficiency and transparency of budgets, payments and procurement enabling cost savings, efficiency gains, and improvements in accountability.<sup>122</sup> According to a CGAP estimate, switching from cash to electronic delivery of government benefits generates roughly 40 percent in savings per transaction.<sup>123</sup>

## Exhibit 6: Digital Financing Trends and Insights

### TRENDS

**Core infrastructure is undergoing substantive changes** as legacy institutions invest in the overhaul of core systems and keep up with new market entrants that exploit niches with newer technology.

**Front-office innovations are being implemented** to engage customers and collect data, both helping to decrease costs and provide the data needed for better product design, services and choices.

**There is a proliferation of digital business models**, both within finance and in the real economy, built on digital finance (e.g., ecommerce and pay-as-you-go models).

**Global monetary systems face new questions and challenges**, as new models mature, and blockchain-powered cryptocurrencies emerge and seem poised to go mainstream.

### INSIGHTS

**Retail innovations are leading the pack**, as tech-based models proliferate across finance and the real economy, primarily as a force for greater inclusion and choice.

**Public finance lags behind, as governments are slow to adapt and unlock the potential that digitalization provides** in the mobilization and utilization of finance and the possible innovations for financing public infrastructure and goods.

**Technology solutions are still developing and finding valuable uses**, with artificial intelligence making great leaps in recent years and blockchains and the Internet of Things still in search of the best applications to finance.

**There will be a period of competition of ideas and business models and a race for data**, but companies with existing or possible future datasets, which fuel the growing digital economy, that can absorb the best ideas will have the advantage.

Source: Adapted from Secretary-General's Task Force on Digital Financing of the Sustainable Development Goals and Accenture Development Partnerships, 'Harnessing the Digitalization of Finance for the Sustainable Development Goals' (New York, 2019).<sup>124</sup>



# DIGITALIZATION, FINANCING AND SUSTAINABLE DEVELOPMENT

## 4.1 THE FINANCING GAP

“Mobilizing sufficient financing remains a major challenge in implementing the 2030 Agenda for Sustainable Development”. So concludes the UN’s Inter-Agency Task Force on Financing for Development (IATF) in its 2019 annual report.<sup>125</sup> The Sustainable Development Solutions Network estimates the shortfall as US\$400 billion per annum to 2030 for 59 less developed countries.<sup>126</sup> The United Nations Conference on Trade and Development (UNCTAD) estimates the shortfall as being of the order of US\$2.5 trillion per year to 2030 for developing countries, with US\$5-7 trillion per year investment required over the same period globally.<sup>127</sup>

***The gap does not arise from a lack of finance.*** The world is awash with money. With increased volatility and uncertainties, private capital is increasingly focused on finding safe harbour and even minimal financial returns. The likely economic downturn in the face of the coronavirus is driving the cost of capital even lower after a decade of historically unprecedented zero and negative interest rates across tens of trillions of dollars of privately held assets. Governments with robust borrowing capabilities are responding to the emerging economic crisis with an expansionist period of debt-based public spending.



***“The financing for sustainable development is available, given the size, scale and level of sophistication of the global financial system.”***

UN Secretary-General’s  
Strategy for Financing the  
2030 Agenda<sup>129</sup>



**Financing is not aligned with the SDGs because of lack of data and standards, misaligned incentives and regulations, and gaps and weaknesses in the institutions and markets through which finance is deployed.** These flaws are well understood. Most obvious is the lack of low cost, trustworthy and timely data that enables SDG-related risks and impacts to be taken into account in private and public financing decisions. Other flaws are more structural, such as weaknesses and gaps in capital markets and the multilateral trading system.<sup>130</sup> Financial and capital markets fail to take SDG impacts into account because of perceptions that such action would reduce financial returns. This is reinforced by short-termism, missing and costly data, and weak or absent standards and definitions.<sup>131</sup>

Yet other problems concern the impact of climate and other environmental factors on the availability and cost of capital in, for example, climate-stressed countries, particularly Small Island Developing States and Least Developed Countries, with the shortfall estimated by one study as already amounting to US\$62 billion per annum.<sup>132</sup> For public finance, institutional weaknesses perpetuate a cycle of insufficient and poorly-used resources, and citizen distrust, despite a growing pool of domestic savings in many developing countries.<sup>133</sup>

**Much is being done to overcome barriers to financing the SDGs, but we are still not on course.** Many initiatives are actively seeking to overcome these flaws and inequalities in capabilities.<sup>134</sup> Many are private sector led and focused on improved risk assessment, such as the Task Force on Climate-related Financial Disclosures.<sup>135</sup> Others are government-led, such the European Commission's Sustainable Finance Framework.<sup>136</sup> There have been advances in international tax information exchange and related measures to address financial crime and money laundering. Despite such efforts, financing remains misaligned with the SDGs.

## 4.2 TODAY'S DIGITAL FINANCING OF THE SDGS

**Today's digitalization of financing is already delivering financing for the SDGs.** The DNA of digital finance – more and better data on risks and impacts, cheaper and wider accessibility of financial services, and innovative products and services – is already being harnessed to finance the SDGs.<sup>137</sup>

### **More and better data drives better accounting of SDG-related risks and impacts**

**Better quality, more granular data allows assessment of social, environmental and financial risks and impacts.** Satellite data, sensors, cloud computing and artificial intelligence, provide information on everything from food production to people's movements. This allows risks associated with climate change such as floods, rising sea levels, heat stress, wildfires and hurricanes, as well as carbon emissions and deforestation to be factored into calculations and scenarios automatically to influence financing decisions.<sup>138</sup> Such data can underpin SDG-related products, market rails such as decarbonization indexes, regulatory performance disclosure and stress testing requirements.

Specialist data analytics tech firms, such as Truvalue Labs use AI to scrape, analyse and interpret alternative data to uncover trends and risks before they manifest themselves.<sup>139</sup> Banks increasingly use big data to segment their customers, assess risks, and prevent fraud. Public authorities are also using big data to identify tax evasion. For example, Russian, Armenian and Italian tax offices use analytics from patterns in reported transactions to identify suspected cases of Value Added Tax (VAT) fraud to better target tax audits.<sup>140</sup>

**Wider availability of data on social, economic and environmental impacts has enabled new sustainable financing instruments.** Availability of investor relevant data on environmental and social risks and opportunities supports their incorporation into financial decision-making. For example Refinitiv manages a database of over 7,000+ global companies and over 400 metrics, including ethical screening criteria, percentage of women in senior positions, CO2 and other emissions.<sup>141</sup> Green bonds, with a global issuance value of US\$770 billion by the end of 2019, rely on better and cheaper data to track use of proceeds.<sup>142</sup> Likewise for impact investing which hit \$715 billion in 2019.<sup>143</sup> 'Gender lens' investing is also growing.<sup>144</sup>

Better data has also enhanced blended financing approaches, as funders diversified their risk-mitigation (e.g. guarantees, risk insurance, subordinated structures) and impact-rewarding methodologies (such as early-stage grants for impact models and social impact bonds).<sup>145</sup> For example, Brazil's national development bank BNDES is transitioning from being direct financier to mobiliser of finance with the issuance of a green bond in 2017 and the Sustainable Energy Fund. BNDES will focus on carrying risks the private sector cannot readily take on and demonstrating project viability to attract further investment.<sup>146</sup>

There is increasing experimentation with the use of distributed ledgers for government transactions. By 2018, there were 202 blockchain initiatives in the public sector across 45 countries in areas including identity validation, personal records, benefits payments, land registries, contract and vendor management, voting, and streamlining interagency processes.<sup>147</sup>

## Exhibit 7: Climate and Digital Finance

Digital finance can support investment in climate change mitigation and adaptation:

- **Digital finance can make it easier to raise investment funds for green projects and performance.** Green bond standards are increasingly well established.<sup>148</sup> High quality data and automatic 'smart contracts' can dramatically reduce costs of issuing green securities.<sup>149 150 151</sup>
- **Big data and standardized analytical frameworks allow climate risks to be factored into investment decisions.** Procurement offices in the Netherlands use a digital platform DuboCalc<sup>152</sup> that accurately assesses environmental costs of different projects. The platform also helps bidders to optimize their designs for sustainability.
- **Scaling carbon markets:** Blockchain and big data are being used to support simpler cheaper measurement, reporting, verification and trading of carbon credits.<sup>153</sup> One example is AirCarbon Exchange, the world's first blockchain based distribution and trading network for carbon credits for the airline industry.<sup>154</sup>
- **Renewable energy financing platforms:** Digital platforms connect users and producers of energy and allow users to provide crowd-funding for green energy investments as well as drawing and contributing energy to the system.<sup>155</sup>
- **Automated index-based insurance:** Index insurance products pay-out based on simple trigger like wind velocity or rainfall, removing the cost of expert assessment are already being piloted across Africa and Asia.<sup>156</sup> Blockchain applications<sup>157</sup> could further reduce costs by an estimated 30-60 percent through the automation of pay-outs and verification.<sup>158</sup>



**More transparent and reliable data can enable SDG impacts to be factored into production and consumption decisions.** Digitalization enables affordable and accurate tracing of global supply chains from sourcing of materials, to manufacturing and distribution.<sup>159</sup> The potential and market for this is being tested through new applications like Everledger<sup>160</sup> for diamonds and Provenance<sup>161</sup> for food, clothing, and other consumer goods which empower companies to make sustainable sourcing decisions. Consumer facing apps, such as HowGood<sup>162</sup> or Giki,<sup>163</sup> aggregate sustainability information and make it accessible to users who scan products while shopping.

## **Reduced transaction and intermediation costs broaden access to financial services**

**Digital financing has broadened access to financial services for millions of low-income customers and MSMEs around the world.** Banks across Asia, Africa and Latin America have offered services to millions of previously underserved customers. For example, in:

- **China**, MYbank uses Alipay's technology to serve millions of SMEs with loans taking less than three minutes to apply, one second to approve and needing zero human intervention. The lending model comes with a steady non-performing loan ratio of about 1 percent.<sup>164</sup>
- **India**, fintech start-ups such as LenddoEFL and CreditVidya offer collateral-free, credit lines, augmented with social media, psychometric, big data, and geo-location information.<sup>165</sup>
- **Kenya**, Equity Bank used ATMs, mobile branches and agents to reach a previously unserved customer base.<sup>166</sup> In Indonesia, BTPN has over 250,000 agents.<sup>167</sup>
- **Latin America**, Mercado Libre provides SME loans, one third of which would have been assessed as 'high risk' based solely on traditional credit bureau information.<sup>168</sup>
- **Mexico**, Banco Azteca has grown its customer base from 0 to 8 million in 5 years by connecting electronic banking to large retail chains.
- **The Solomon Islands**, National Provident Fund's "You Save" account enables people to pay money into their retirement savings accounts using a simple three-digit code to transfer airtime credit.<sup>169</sup>
- Major banks are applying machine learning to assess credit risk. While initially concentrated on consumer credit and large corporations they are now also beginning to apply this to the SME sector.<sup>170</sup>

Digital agriculture platforms such as HeveaConnect,<sup>171</sup> a digital marketplace for sustainably processed natural rubber, offers trade financing and insurance to rubber producers. Similarly, DigiFarm and AgriBuddy provide finance in addition to agricultural inputs, farming information and product markets.<sup>172</sup> This not only offers access to financing but tailored services that enable economic advancement of MSMEs and women<sup>173</sup> as well as youth education and employment.<sup>174</sup>

Using digital finance can be a key step towards formalization for the two thirds of the global workforce that is engaged in the informal economy.<sup>175</sup> Mobile money accounts can be a first step towards access to finance, social safety nets, and formalization of small savings and microinsurance, which aggregated can provide a source of capital for SDG implementation on a broad scale.

CEO Partnership for Economic Inclusion developed by the UN Secretary-General's Special Advocate for Inclusive Finance for Development (UNSGSA) has catalysed Mastercard and Rabobank to scale up a digital platform that connects small-scale farmers with buyers, provides mobile payment tools, giving users a financial track record.<sup>176</sup> The Better Than Cash Alliance, a partnership of governments, companies and international organizations is working to accelerate the transition from cash to digital payments to advance the Sustainable Development Goals.<sup>177</sup> Central Banks are considering issuing their own digital currencies in order to support financial inclusion, operational efficiency, financial stability, monetary policy effectiveness, and financial integrity.<sup>178</sup>

Banks, mobile operators, digital platforms and fintech start-ups are using big data to expand access and lower the cost of credit, reduce application times, and offer existing debt refinancing alternatives.<sup>179</sup> A recent Consumer Financial Protection Bureau study found that digitally enhanced scoring resulted in 27 percent more loan approvals with 16 percent lower interest rates across all customer segments.<sup>180</sup> Research finds that digital finance in developing countries increases savings behaviour.<sup>181</sup>

In developed countries, new fintech-enabled entrants are offering substantially higher interest rates on deposits, often double or triple those offered by traditional banks.<sup>182</sup> Robo-advisors have expanded people's access to well-diversified asset pools by lowering capital thresholds and cutting out expensive financial advisors.<sup>183</sup> These services charge as low as 0.25 percent of assets managed compared to 0.75-1.5 percent by traditional intermediaries.<sup>184</sup>

***Marketplaces and exchanges can link producers and consumers concerned with sustainability, facilitating sales of carbon credits, biodiversity offsets and ethically sourced and labelled products.*** IHS Market's Environmental Registry is the world's largest and allows buyers and sellers to track environmental projects, list, issue, transfer and retire credits for carbon, water and biodiversity.<sup>185</sup> Other digital exchanges such as Puro,<sup>186</sup> AirCarbon<sup>187</sup> or ClimateTrade<sup>188</sup> are supporting the decentralization and scaling of carbon markets. Some online platforms specialize in sign-posting sustainability: a wide range of generalist<sup>189</sup> and specialized ethical and sustainable digital marketplaces<sup>190</sup> are targeting consumers in developed countries and emerging markets such as Indonesia.<sup>191</sup> These platforms have given consumers wider options for aligning their investment and consumption decisions with their values.

***Cheap digital money transfers facilitate both private remittances and public assistance disbursements, supporting greater economic security.*** Remittance providers like WorldRemit, allow people to send money home cheaper and faster than incumbents.<sup>192</sup> Companies like TransferWise are partnering with banks to offer compelling remittance products,<sup>193</sup> while mobile money seems positioned to transform the remittance market.<sup>194</sup> The G20 and Bank of International Settlement's Committee on Payments and Market Infrastructures cross-border payments initiatives are addressing barriers to cheaper and faster cross border payments including remittances.<sup>195</sup>

Governments and humanitarian agencies use electronic transfers to distribute social payments, improving efficiency and transparency and reducing leakage. Digitalization has saved India's government an estimated US\$22 billion to date,<sup>196</sup> and Mexico saw US\$1.3 billion annual savings after digitizing its treasury functions.<sup>196</sup> UNHCR, WFP, UNICEF and UN Women who collectively deliver over half of global humanitarian cash assistance have digitized transfers in contexts where connectivity, payment infrastructure and digital financial services were available, and are currently working on scaling up and harmonizing their approaches.<sup>198</sup>

## ***Innovative business models are emerging in response to growing demand by citizens concerned with SDG impacts.***

***Parametric insurance products can support greater resilience to climate change.*** Index insurance is a model which triggers automatic pay-outs to farmers based on automated satellite readings and weather and rainfall meters. Public-private initiatives are experimenting to remedy challenges of imperfect coverage, liquidity constraints and lack of trust among farmers, and improve contract design and marketing to reach more people.<sup>199</sup> The World Bank's Global Index Insurance Facility (GIIF) has supported the rollout of index-based insurance for over 27 million smallholder farmers and micro-entrepreneurs across Africa and Asia.<sup>200</sup> Central banks are implementing policies to enable digital product innovation for SMEs and micro businesses to mitigate and build resilience to climate change, including climate-risk insurance, post disaster reconstruction and pay-as-you-go renewable energy.<sup>201</sup>

***Specialist crowdfunding and P2P platforms are democratizing sustainable investments,*** primarily in easily financialized SDG areas, such as renewables and sustainable infrastructure. Crowdfunding platforms like Bettervest<sup>202</sup> and Oneplanetcrowd<sup>203</sup> channel investments to community and small businesses' renewable energy projects. Sustainability robo-advisors, like Betterment<sup>204</sup> that specializes in sustainable investments and Ellevest<sup>205</sup> that applies a gender investment lens are another option for conscious investors. These AI-based products offer reduced commissions with low capital thresholds<sup>206</sup> and integrate users' risk-adjusted returns preferences with their social and environmental priorities, based on companies' environmental, social, and governance data.<sup>207</sup>



## Exhibit 8: Gender and Digital Financing

Digital finance improves women's access to secure, affordable financial services and can better enable investors to direct investment towards women's empowerment.<sup>208</sup>

- **Digital services overcome barriers women face in accessing finance, such as lack of collateral or formal bank records.**<sup>209 210</sup> Mobile payments providers for small businesses, such as Kopo Kopo in Kenya, offer merchants cash advances, based on digital transaction records. The business owner repays electronically based on the day's revenues. Pay-as-you-go systems reduce time spent fetching wood or water<sup>211</sup> and ecommerce opportunities can be compatible with family responsibilities.
- **Building digital capabilities:** In Tanzania and Mozambique a partnership between TechnoServe, the ExxonMobil Foundation and Vodacom is trialing a combination of mobile savings accounting with business skills training for urban businesswomen, using a combination of face to face access and interactive mobile learning platform. The training leads to women saving and taking out microloans through mobile accounts.<sup>212</sup>
- **Data for smart gender budgeting:**<sup>213</sup> Austria is a world leader in gender budgeting with requirements to set and report against gender-related outcomes and integrate them into performance contracts, and impact assessments. A web portal ([www.wirkungsmonitoring.gv.at](http://www.wirkungsmonitoring.gv.at)) publishes sex disaggregated data and budget information and offers a gender and diversity atlas.<sup>214</sup>
- **Digitalization can support the collection of sex-disaggregated data critical for informing gender-sensitive public and private investment strategies.**<sup>215</sup> 'Gender lens investing' includes investment strategies aimed at advancing women in finance and corporate leadership, supporting products to improve women's lives, and improving women's treatment in the workplace.<sup>216</sup> More sex-disaggregated data can further improve the ability to better serve women clients. It also contributes to growing evidence on the positive relationship between gender equality and financial performance.
- **The digitalization of social protection programmes** can positively impact the way women participate in economies. It can provide women with independent access to predictable income streams and give female recipients greater control over how the money will be used within households.<sup>217</sup>

It is critical that digital financing solutions are grounded in the reality of the challenges women face. Lack of affordable devices, data, skills and social norms such as online harassment, prevent women accessing the digital world.<sup>218</sup>

The Alliance for Financial Inclusion (AFI) has developed a Policy framework for women's financial inclusion using digital financial services. It includes guidance on policy, regulation, infrastructure and demand side capabilities and consumer protection.<sup>219</sup> UNSGSA is collaborating with Melinda Gates and the French Minister of Finance to promote a major G7 Partnership for Women's Digital Financial Inclusion in Africa.<sup>220</sup> Efforts to improve sex-disaggregated statistics include work by UNSGSA, UN Women, Data2X, World Bank, AFI, IMF.<sup>221</sup>

**Digitalization enables circular economy, sharing and usership-based models** which can optimize processes to reduce cost, waste and environmental impacts.<sup>223</sup> These innovations allow citizens with limited resources to get on-demand access to products or services, and even food. These are as relevant in East Africa, where Hello Tractor provides on-demand access to farming machinery, as in Europe with co-use of cars and bikes, office space, household equipment, and clothing.<sup>224</sup>

Sharing models have had positive SDG effects on the economy through increased productivity and supplementary income streams, and on the environment through reduced production and waste.<sup>225</sup> However, they can also provide highly contingent and insecure employment and income streams, which risk leading to higher levels of inequality, exploitation and poverty.<sup>226</sup>

**Digital assets are starting to redefine how and what value is captured**, offering a transparent, verifiable means for backing and exchanging values that traditionally were not priced in the financial system.<sup>227</sup> Natural capital-backed digital assets, such as CarbonCoin,<sup>228</sup> BioCoin<sup>229</sup> or CedarCoin,<sup>230</sup> are experiments in offering citizens the opportunity to invest in outcomes like reforestation and conservation. Applications and initiatives such as RecycleBank<sup>231</sup> and JouleBug<sup>232</sup> and 'city coin' developed by Colu<sup>233</sup> use 'gamification' strategies to link real world sustainable behaviours through online 'points' to rewards and discounts.<sup>234</sup>

While many of these are early stage enterprises, they demonstrate the potential for innovation using digital finance towards sustainable development challenges.

## 4.3 DIGITAL FINANCING FOR EVERY SDGs

**Digital finance helps to channel more resources toward all of the SDGs, albeit through different pathways.** Goals in areas such as sustainable infrastructure, energy, water, transport, and financial services, are more easily financialized because they have paying users. Digitalization helps direct existing public and private investments but also empowers individuals to invest in sustainable infrastructure and utility services by reducing information gaps.<sup>235</sup>

Digitalization allows transaction visibility and traceability of production, employment, and business conditions related to **economic SDGs**, such as decent work, manufacturing, agribusiness, sustainable production and consumption. Such transparency, coupled with lower cost of services delivered through digital platforms, supports expanded provision of affordable and tailored financial services. Digitalization also supports unconventional mechanisms for financing economic activities that bypass the traditional financial system, such as crowdfunding or (community) crypto-currencies and facilitate sustainable consumer purchases.<sup>236</sup>

Digital finance can target reduction in the negative effects of global consumption and production patterns on **environmental SDGs**. Satellites, sensors, publicly available scientific data and ESG disclosure help capture and integrate information about climate change, biodiversity loss, pollution and disaster risks into financing decisions, for example via green securities and sustainable robo-advisors. Digital platforms support carbon markets, which grew fivefold between 2017 and 2019, reaching US\$215 billion.<sup>237</sup> Objective, automated verification through data tokens can support scaling up of carbon trading.

Progress on **social SDGs** hinges, to a large extent on the ability to effectively manage public financing and assess performance of institutions. Digitalization improves availability of data on public services and citizens' ability to review and demand accountability. Digital finance reduces remittance and e-transfer costs and enables e-service provision. It also supports innovations such as gender lens investing, P2P international giving, micro-insurance, or bias-detecting algorithms. Analysis of macro level data shows that access to mobile phones is positively associated with multiple indicators linked to social development, such as lower gender inequalities, enhanced contraceptive use, and lower maternal and child mortality.<sup>238</sup>

# Exhibit 9: Digitalization Already Enables Financing of the SDGs

	Economic	Environmental	Social
			
More and Better Data	<ul style="list-style-type: none"> <li>Transaction records</li> <li>Credit scoring</li> <li>IoT data / smart metering</li> <li>Supply chain tracking</li> <li>Open government data</li> <li>Crowdsourced project accountability data</li> <li>Open finance</li> </ul>	<ul style="list-style-type: none"> <li>Satellite imagery</li> <li>IoT data / smart metering</li> <li>ESG data</li> <li>Data tokens for climate impact reporting</li> </ul>	<ul style="list-style-type: none"> <li>Gender-disaggregated data</li> <li>Open public finance data</li> <li>Transparent public records</li> <li>Crowdsourced project accountability data</li> <li>ESG data</li> </ul>
Cheaper Intermediation and Aggregation	<ul style="list-style-type: none"> <li>Mass-market digital finance</li> <li>Pay-as-you-go utility financing models</li> <li>Digitalized value chain / trade finance</li> <li>Fair trade, ethical, sustainable ecommerce/ digital marketplaces</li> </ul>	<ul style="list-style-type: none"> <li>Digital exchanges for carbon credits / bio-diversity offsets</li> <li>Platforms for climate project financing</li> <li>Aggregation / securitization of assets</li> <li>Green banking products</li> </ul>	<ul style="list-style-type: none"> <li>Remittances / humanitarian transfers</li> <li>Digital marketplaces / ecommerce platforms</li> <li>Mass-market digital finance</li> <li>Digital education / health care financing schemes</li> <li>E-government services</li> </ul>
Disintermediation and New Business Models	<ul style="list-style-type: none"> <li>Crowdfunding / P2P lending</li> <li>Gamified 'green' consumption</li> <li>Circular economy models</li> <li>Fractional asset ownership</li> <li>Digital currency-based project finance / community services</li> <li>AI-enhanced tax optimization</li> </ul>	<ul style="list-style-type: none"> <li>E-trading of natural capital backed digital assets</li> <li>Remote verification insurance and financing</li> <li>Gamified sustainable behaviours</li> <li>Sustainability robo-advisors</li> </ul>	<ul style="list-style-type: none"> <li>Gender-lens crowdfunding &amp; investing robo-advisors</li> <li>Bias detection algorithms</li> <li>Robotized m-education / health</li> <li>Digital micro-insurance</li> <li>Participatory budgeting</li> <li>Algorithmic illicit flow tracking</li> <li>Digital donation platforms</li> </ul>







## CITIZENS, DIGITALIZATION AND FINANCING THE SDGS

To scale up the potential of these early signals of digital finance aligned to the SDGs requires citizen-centric finance that empowers people as buyers, savers, investors, borrowers and lenders, as well as tax-payers and the users of public services and infrastructure.

***Digitalization's heartbeat is the valued aggregation of many small parts.*** Digitalization enables large amounts of data, to be cheaply collected and quickly analysed and used. It enables servicing hard to reach mass market at lower cost. Massive volume of payments data can enable automated lending. Cheap aggregation of small amounts of money can mobilize smaller-scale crowdfunding as well as larger scale financing, exemplified by Kenya's M-Akiba retail bonds<sup>239</sup> or UK's PrimaryBid<sup>240</sup> that allows retail investors to participate in corporate equity fundraising.

***Citizens can be informed and empowered through digitalization.*** Citizens are the ultimate owners of all financial capital. Yet the opaque complexity of modern finance has, as we have argued above, stripped out their effective agency in most financing decisions. Digitalization is potentially a game changer in reconnecting citizen's priorities with financing decisions.



***Digitalization's  
heartbeat is the valued  
aggregation of many  
small parts.***

***Digital finance increases financial inclusion.*** Digitalization can first and foremost empower citizens by providing basic financial inclusion.<sup>241</sup> While the vast majority of account owners have an account at a bank, a microfinance institution, or another type of regulated financial institution, mobile money accounts are also growing and reaching new customers, particularly in Africa and least developed countries.<sup>242</sup> Digital finance has enabled millions of women, youth, rural residents, people with low incomes, and small business owners to save safely, borrow cheaply, invest securely, and insure easily. There is further potential to reach other groups such as the elderly



and forcibly displaced people.<sup>243</sup> The broader development impact of greater financial inclusion has become a topic of some debate,<sup>244</sup> highlighting the need for adequate consumer protection safeguards.<sup>245</sup> However, what is clear is that digitalization has enhanced citizen's ability to manage their finances and their agency within the formal financial system.

New entrants and traditional financial institutions are diversifying the range of financial services available to currently 'underbanked' citizens who lack appropriate and affordable options. They are also devising solutions to help customers improve financial management through automated reminders, alerts, and nudges.<sup>246</sup> For example, research shows that people save more when savings products are supported by two-way SMS, mobile learning platforms, and commitment mechanisms like default contributions and locked savings pots.<sup>247</sup>

***Citizens care about more than financial returns and, if they are given information can make decisions which steer their money more effectively towards their goals.*** Digitalization enables citizens to be more informed and engaged in steering the use of funds intermediated by public or private intermediaries on their behalf. Financial intermediaries can and need to play a critical role in connecting financial markets to individual end-users in an efficient way and in mitigating many risks for end-users. However, while intermediaries optimize risk adjusted financial returns within any given investment universe, citizens have broader concerns, most directly including the fear of job loss and the health and safety of their families, through to wider issues such as climate change. Wider disclosure of companies' environmental and social impact, reliable information on global supply chains and production processes, and open data on public budgets and projects allow citizens to direct their own financial decisions in line with their values. Responding to customer demand, banks such as Dutch Triodos Bank, German UmweltBank AG, Indian YES BANK, BNP Paribas, ING Bank, and Société Générale are increasingly offering sustainable products such as green deposit and savings accounts, funds, lending and mortgages.<sup>248</sup>

***By making more and better data available and actionable, digitalization enables citizens to make more informed financing decisions,*** expressing both their direct financial and non-financial interests. Environmental, social and governance data is increasingly being produced, standardized and used by financial intermediaries. European Union (EU) regulations require pension funds to consult with intended beneficiaries,<sup>249</sup> in shaping their investment strategies and mandates, digital data and technologies offer a means to do this effectively. In 2018, over 50 percent of shareholder resolutions filed in the US focused on environmental and social issues. Greater access to data can further inform SDG-related shareholder resolutions.<sup>250</sup> Credit Suisse suggests that 'responsible consumption' could amount to US\$4.5 trillion annually by 2030.<sup>251</sup> Robo-advisors, including DBS' digiPortfolio,<sup>252</sup> are playing a role in democratizing investment management services by reducing commissions and lowering capital thresholds.<sup>253</sup>

***Citizens and their representatives have used open data to hold governments to account for the use of public finance.*** Open government data standards and portals and information crowdsourced from citizens allows civil society organizations, media and parliamentarians to track public spending on social services or infrastructure projects. For example, in Mexico, citizen groups used the Budget Transparency Project to push for more sustainable transportation,<sup>254</sup> in Argentina, women's rights groups insisted on adequate budget allocation for action on gender-based violence after identifying budget

gaps,<sup>255</sup> and in Colombia information on projects funded with mining royalties published on MapaRegalias platform improved project completion rates and increased the number of irregular cases brought to court.<sup>256</sup> Registries of company ownership are being made public enabling citizens, regulators, law enforcement and potential business partners to more easily see who they do business with and identify any government connections. The Open Corporates database aggregates information from public registries and to date covers 160 million companies, with 1.2 million users a month.<sup>257</sup>

***Digitalization creates new ways for citizens to connect and to act collectively through aggregation of individual financing decisions.*** Digital platforms and marketplaces connect producers and consumers, capital holders and capital seekers allowing them to make deals together. Integration of sustainability information into online shopping sites<sup>258</sup> and greater convenience in accessing sustainable products and services have boosted sustainable consumption.<sup>259</sup> Crowdfunding platforms and peer-to-peer lending has opened new avenues for aggregating atomized interests, enabling citizens to overcome trust barriers and free riders to act collectively in financing things they value. Through special-interest platforms, citizens have mobilized and funded each other's sustainable development projects ranging from renewable energy to legal cases to protect the environment and human rights.

UK-based crowd-funding platform, Abundance, for example, is offering small investments in sustainable municipal projects to residents of these city areas.<sup>260</sup> Alipay Ant Forest platform has 550 million users who have collectively reduced carbon emissions by over 12 million tons by May 2020.<sup>261</sup> Digital currencies and assets are being used to tokenize sustainable behaviours and natural capital, allowing citizens or citizen groups to back them. Digital community currencies are testing ways to unlock citizen choice in consuming and supporting local businesses and economies.<sup>262</sup>





# CHALLENGING DIGITAL FINANCING FUTURES

## 6.1 UNCERTAIN FUTURES

***Predicting the future of digital finance would be foolhardy.*** Whilst Bitcoin has moved quickly from headline news to systemic irrelevance, emerging plans for global digital currencies might, or might not, prove to be of huge importance. Digitalization will play an important role in improving investor-facing corporate disclosure, but such disclosure might ultimately become less significant with the growth of so-called 'alternate' data from non-corporate sources.



***“Growing opportunities created by the application of digital technologies are paralleled by stark abuses and unintended consequences.”***

UN Secretary-General's High-Level Panel on Digital Cooperation<sup>263</sup>

In the face of intense competition from new entrants, some of today's banks will falter but those that grasp the right opportunities could become dominant players in tomorrow's digital world. The advance of digitalization may be an inevitable aspect of this moment in human history. But its future pathways and impacts are by no means set in stone.<sup>264</sup>

- Barriers to digitalization of financing may not only delay the speed and breadth of its roll-out, but also how it emerges and with what effects.
- Risks that accompany digitalization, likewise, will have uneven effects, possibly benefiting some whilst harming others.

Whether digitalization supports the acceleration of financing for the SDGs depends, in short, on whether these barriers are overcome, and risks mitigated.



## 6.2 BARRIERS AND RISKS

### *Today's patterns do provide some indications of tomorrow's possibilities.*

Despite such uncertainties, today's trends point to some likely features of tomorrow's world of digital finance. Today, for example, 750 million people remain without physical access to a mobile or broadband network.<sup>265</sup> Poor ICT infrastructure in less developed countries is often compounded by economic, educational or energy access limitations. Challenges such as basic mobile device ownership or high service costs caused by market distortions continue to exclude the poor in digital finance, as does lack of education or consistent access to reliable energy sources. In low and middle-income countries, women are 23 percent less likely than men to use the internet. This gap is growing and is largest in the Least Developed Countries (LDCs).<sup>266</sup> While it is likely that access to affordable internet connectivity will expand, deliberate efforts are needed to close gaps in inclusion, including the gender gap.<sup>267</sup>

Nearly half (45 percent) of digital financial accounts created in the spirit of financial inclusion have not been used over the past year,<sup>268</sup> due to barriers including usability, costs, safety and security concerns, relevance, skills gaps and societal norms.<sup>269</sup> Women, rural residents, low-income people, especially in LDCs, remain disproportionately excluded. Women and girls are less likely to have the education, skills and confidence to participate in digital financing, largely due to poverty and cultural norms.<sup>270</sup> The elderly, a growing segment of most populations, will face increasing challenges as the pace of technology-driven financial innovation accelerates.

Digital finance is likely to come to all countries, and to be available to most people. Yet most countries will remain the recipients not the suppliers of such services. Shortages of entrepreneurial and tech talent, or a lack of resources to support their efforts, pose challenges for many countries, but will be most marked in less developed countries.<sup>271</sup> Tech talent in particular is highly competitive. Women are systematically underrepresented in IT, finance, fintech, and in regulatory and policy making positions. An industry that intends to serve women but has no women in its leadership and technical positions will miss complementary perspectives and will likely fail to serve the entire population.



*The advance of digitalization may be an inevitable aspect of this moment in human history. But its future pathways and impacts are by no means set in stone.*

Policy makers and regulators in most countries also struggle to keep pace with the rapid evolution of digital finance, again notably in developing countries. Such gaps, if not overcome, at best cement dependency in those countries on the enterprises and regulatory norms of better endowed countries.

***Citizens' benefits come with increased risks.*** Digitalization offers growing potential benefits to citizens who can access and make valuable use of improved, customized, cheaper financial services. Individual saving and investments should become easier and more rewarding, with more choice, portability and transparency. Growing numbers of people working as independent traders and contractors or running small businesses will have cheaper and faster access to borrowing. Such benefits will however come with risks.

Digitalization puts people at risk of privacy violations and data security breaches,<sup>273</sup> fraud, irresponsible lending, and discrimination based on profiling.<sup>274</sup> This might be through, for example, cryptocurrency exchanges,<sup>275</sup> fake transactions on ecommerce sites or peer-to-peer marketplaces<sup>276</sup> or online gaming, and fraudulent crowdfunding campaigns.<sup>277 278</sup> Traditional consumer protection risks such as lack of transparency, unfair or discriminatory treatment, disproportionate, improper or unauthorized use of data by financial service providers, deceptive sales and marketing techniques can also be amplified through digital channels.<sup>279</sup> New types of financial service providers, such as mobile operators and digital platforms, may be operating outside of traditional financial regulations leading to lack of consumer or investor protection.<sup>280</sup>



**UNDP's Human Development Report 2019 points to convergence of 'basic' capabilities, whereas 'enhanced' capabilities underpin a 'new generation of inequalities', focused on two seismic changes - technology and climate change.<sup>272</sup>**

**Data gaps, biases and ownership limit finance's alignment to the SDGs.** To be useful economic, social, environmental and governance data must be able to be aggregated, analysed and used across multiple platforms.<sup>281</sup> Many factors mobilize against this. Data from the informal sector is harder to gather, let alone aggregate, all the more so if individuals and companies lack the capabilities and tools to produce such data, or are anxious not to be observed by their respective governments. Lack of disaggregation by critical factors, such as sex, makes segmented analysis more difficult. When such data is available, fragmented, non-interoperable systems restrict useful data aggregation and analysis. Too often data quality and integrity remain a challenge.<sup>282</sup>

Digitalization of finance creates a possibility that product design, artificial intelligence and algorithmic decisions will replicate gender and other biases and discrimination.<sup>285</sup> Small developing economies which have not yet harvested large pools of data are particularly vulnerable to biases since lending algorithms will be trained on foreign data, in particular when virtual banks are established by global banking groups or BigTech firms. Automation and machine learning based on incomplete or bias-saturated data may also further marginalize sections of the population already facing disadvantages.<sup>286</sup>

Privacy and security of personal data has become a critical issue, especially with digital platforms and mobile operators gathering so much data about users. Encouraging access and use of data that supports innovations aligned with citizens' needs may take precedence in the short-term in countries looking to establish the bases for digital financing ecosystems. However, securing adequate protection of citizens' personal data and privacy is increasingly viewed to be paramount for lasting, sustainable citizen benefit.<sup>287</sup> Different countries are adopting different approaches to use, ownership, and protection of data. The European Union has introduced General Data Protection Regulation (GDPR) to secure people's rights over their data,<sup>288</sup> but the impact of this legislation is too early to judge despite moves by several jurisdictions to emulate it.<sup>289</sup> In the main, consumer consent remains a challenging construct.<sup>290</sup>

## Exhibit 10: Barriers and Risks

### BARRIERS

**Lack of basic access:** 750 million people lack broadband connectivity,<sup>283</sup> 1 billion lack formal IDs<sup>284</sup>

**Capability gaps:** illiteracy, poverty, social norms and lack of digital capabilities hinder uptake and usage and reinforce inequality

**Access to appropriate digital financial services:** lack of affordable, secure, relevant digital financial services

**Patchy data to support financial decision-making** and digital financing innovation, particularly in relation to low income countries

**Siloed and non-interoperable IT systems** hinder use of data to price risk, describe impacts and underpin accountability

**Talent shortage** hinders digital financing innovation, particularly in less developed countries

**Weak regulatory capabilities** undermine the establishment of enabling policy and regulatory environment for digital financing innovation

**Incumbent resistance** to disruption, disintermediation, and digitally-enabled transparency of their activities and rewards

### RISKS

**Data security and privacy** risks are amplified

New **fraud and money laundering**, for example on digital marketplaces, cryptocurrency exchanges, crowdfunding platforms

**Irresponsible digital financial products** with opaque or misleading terms and conditions and insufficient recourse measures

**Data monopolization** or exploitative use of data can stifle future digital financing innovation and undermine consumer trust

**Unfair treatment** can arise from discriminatory algorithms based on biased data or hyper-personalization of financial services

**Short-termism, volatility trading and herd behaviour** has grown with digitalization and algorithmic trading

**Market concentration and rent-taking** derives from ever increasing returns to scale and growing complexity and opacity

**Lack of, incomplete or over-regulation** stifles market innovation





***Data access and protection pathways reflect tensions between competing visions - openness, paternal control, bourgeois civility, or commercial and state interest.<sup>291</sup>***

Data localization requirements continue to impact the shift to digital. Data issues also have an important cross-border dimension, requiring regional if not global alignment of data privacy, protection, access, and trade frameworks. The G20 Summit in Japan highlighted the importance of “data free flow” for productivity, innovation and sustainable development but reaching concrete agreements has proved difficult, in part due to sovereign interests and concerns around national security matters.<sup>292</sup> The United States, Mexico and Canada Agreement (USMCA) Digital Trade chapter prevents restriction of cross-border information transfers. Yet exceptional circumstances remind us of the urgency of reaching such global convergence, especially when cross-border data proves so vital for pinpointing infectious diseases outbreaks, predicting progression and saving human lives.<sup>293</sup>

***Cybersecurity is becoming the most important systemic risk in digital financial services.***

Just as citizens become more vulnerable, so do businesses, governments and the financial system as a whole. Cyberattacks affected over 4 billion records in the first half of 2019 alone, representing a 54 percent increase from the same period in 2018.<sup>294</sup> Over the past two years, cyber insurance premiums have tripled<sup>295</sup> as the costs associated with cybercrime continue to grow.<sup>296</sup> Financial institutions increasingly rely on a handful of cloud infrastructure providers, with similar IT features and systems. Such data concentration increases the risk of it being targeted and compromised and creates the potential for cascading effects from breached entities.<sup>297</sup> Global standards such as Financial Action Task Force (FATF),<sup>298</sup> CPMI-IOSCO guidance on cyber resilience<sup>299</sup> and CMPI strategy against wholesale payment fraud related to endpoint security<sup>300</sup> provide a first barrier against these risks.

***Digitalization can improve market efficiency but may drive an over focus on volatility trading and rent-taking.***

Digitalization increases the volume of short-term transactions focused on profiting from market volatility.<sup>301</sup> The UK’s Financial Conduct Authority (FCA) has highlighted the costs of high-frequency trading, or ‘latency-arbitrage’ races where market actors front run traditional equity traders such as pension funds and their intermediaries.<sup>302</sup> The FCA estimates that such arbitrage can cost traditional equity traders using UK markets as much as US\$5 billion a year in lost, profitable trades. To



***Digitalization supports steeply increasing returns to scale, with near-zero marginal costs of service, and dramatic synergies in the application and value of data.***

curb the negative effects of this practice IEX, a US-based stock exchange, has for example introduced a 350-microsecond delay designed to prevent high-speed traders with faster data feeds from trading with disadvantaged individual investors at potentially stale prices.<sup>303</sup> The Bank of International Settlements has established an Innovation Hub to explore critical trends in financial technology relevant to central banks such as digital currencies, stablecoins, and the use of technology in financial regulation.<sup>304</sup>

**Digital disruption drives innovation but is likely to be followed by growing market concentration.** New entrants offer financial services through product and enterprise innovation, operating on the edges or outside of existing financial regulatory regimes. Digitalization supports steeply increasing returns to scale, with near-zero marginal costs of service, and dramatic synergies in the application and value of data. As enterprises grow, they can further enhance service offerings in broader areas. Grab and Uber are leveraging payments data to offer credit lines and insurance products to drivers, and M-KOPA is using M-Pesa payments data to supply 'pay-as-you-go' access to clean energy and consumer debt.

Digital platforms succeed when they can harness network effects and associated increasing returns to scale. The associated benefits may also have costs resulting from increasing market concentration and the use and privacy of data.<sup>305</sup> Macroeconomic impacts and systemic risks also need to be considered, arising from this increased market concentration, and associated risks such as algorithmic pro-cyclicality and contagion, and potential dilution of full control over monetary outcomes.<sup>306</sup>

**Rent-taking by financial intermediaries** remains a major risk of digitalization to the extent that it contributes to increasing levels of complexity and opaqueness in well-developed financial and capital markets and poses a regulatory challenge of tracking rapid evolution of digital finance. A landmark study highlighted that the margin taken by the financial sector for intermediation of investment in the US has remained constant at about 2 percent for more than a century despite increased volumes and technological developments, suggesting that intermediaries have absorbed the financial benefits from the associated cost reduction effects.<sup>307</sup>

The recent promulgation by the European Union of a revised Payment Systems Directive (PSD2)<sup>308</sup> illustrates a context specific regulatory approach to securing a level playing field for new players, which could support partial disintermediation. For incumbent financial institutions, cost reduction from digital represent both an opportunity and threat to their bottom line as their market is opened up to radically cheaper competition. Many incumbents are racing to invest in emerging technologies to improve service to customers and enhance operations. Some, however, may resist increased transparency of their activities and rewards.

For public financing, similarly, realizing the digital dividend is largely dependent on both sound investment in functional digitalization, and the willingness of governments to underpin the 'trust ecosystem' with enhanced transparency, targeting and assessment of public spending.





***Inherent uncertainties, barriers and risks combine to make the future a place to be shaped rather than predicted.***

***Digitalization depends on energy access and supply.***

While digitalization supports the rapid transformation of our economic systems, it could equally drive emissions higher.<sup>309</sup> The energy intensity of the ICT sector itself is increasing by 4 percent per year, in contrast to the 1.8 percent annual decrease in global GDP's energy intensity.<sup>310</sup> In telecommunications mobile networks are more energy intensive than fixed networks<sup>311</sup> and connectivity drives demand for data and content. Much of the energy use is by centralized network and data centre infrastructure rather than consumer devices.<sup>312</sup> For example, Cambridge Bitcoin Electricity Index estimates that bitcoin alone uses 84.23 TWh of energy a year<sup>313</sup> which is comparable to the power consumption of Austria.<sup>314</sup> As a response, the ICT industry has recently launched a first sector-wide pathway to net zero.<sup>315</sup>



A network diagram on a blue background. It features a central node with a large white number '3' inside a blue circle. This central node is connected to several other nodes, some of which are also highlighted with blue circles. The background is filled with a complex web of light blue lines and dots, representing a larger network structure.

**3**

## **SECTION 3**

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# **ACTION AGENDA**



## CALL TO ACTION

### 7.1 SHAPING DIGITAL FINANCING FUTURES

**Digitalization will not automatically deliver SDG-aligned financing.** Uncertainties, barriers and risks combine to make the future something to be shaped rather than predicted. Technological developments will clearly play an important role, notably in determining the cost, pace and quality of digital infrastructure, and in shaping the environmental footprint of digitalization. However, it is human agency and choice, and a balance of private capabilities and public interest that will ultimately determine the extent to which digitalization accelerates financing for the SDGs.

Commercial entrepreneurship will shape financial innovations and associated market dynamics and outcomes. Governments' policies, fiscal regimes and procurement-based incentives will play a critical role in catalysing financial innovations, shaping markets and the quality of their own spending. Financial regulators and standard setters shape the rules of the game through compliance requirements and development of international norms.

**Citizens, perhaps more than any of these other change agents, are the X-factor in shaping the future.** Digitalization is already subjecting most people to an avalanche of information that is often hard to make sense of, let alone act on in informed, deliberate ways. Yet digitalization simultaneously provides citizens with new pathways to learn and act, in the world of finance as well as elsewhere.



***“The international community should act in reshaping financial systems in line with sustainable development. If we fail to do so, we will fail to deliver the 2030 Agenda”.***

UN Inter-Agency Task Force on Financing for Sustainable Development<sup>316</sup>

The balance of these effects will be all-important in determining the success or failure of efforts to realize the transition to sustainable development. Likewise, it will be the critical variable in determining the effects of digitalization in accelerating financing for the SDGs.

Failing to empower citizens could mean continued shortfalls in the effective use of, and accountability for public financing. Financial and capital markets, likewise, would likely continue to absorb an unreasonable share of the economic cake in delivering intermediation services that fail to take adequate account of citizen's broader priorities and needs.



***The SDGs are, after all, no more or less than an expression of citizens' collective interests and needs***

Succeeding, on the other hand, in leveraging digitalization to empower citizens to recover effective control could make the critical difference in financing the SDGs. Citizens, individually and collectively, could more effectively ensure that public and private intermediaries who use their money deliver what counts. The SDGs are, after all, no more or less than an expression of citizens' collective interests and needs.

## 7.2 ACTION AGENDA

***Digitalization's impact on financing for the SDGs is not a matter of technology adoption but of choice and agency.***

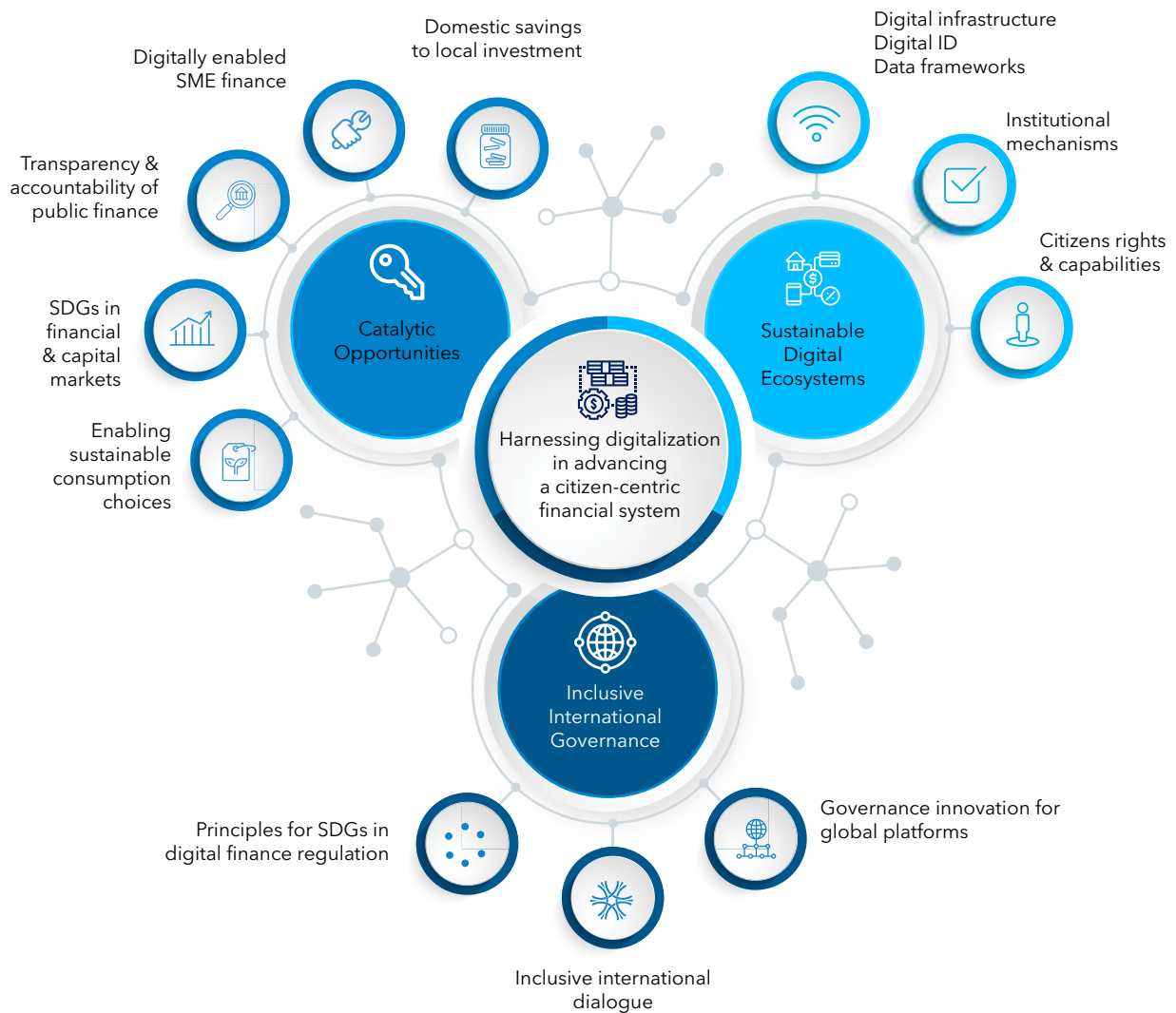
***The Task Force's Call to Action is to harness digitalization to advance citizen-centric finance and accelerate financing for the SDGs.*** Implementing such a call to action is no small matter given the scale and dynamic complexity of today's global finance. Governments, regulators, financial practitioners and experts are likely to argue that such a vision is impractical, that citizens are not capable of managing their own basic financial affairs, let alone the broader landscape of global finance. 'Leave it to the professionals' might be an expected, and well-intentioned response. But such responses miss the point. There is without doubt a need for deep expertise in effectively deploying the world's financial resources. The shift needed is for such expertise to be in the service of citizens, the owners of the money being deployed.

***Digitalization could enable evolution from financial inclusion to citizen-centric finance.*** Digitalization has already supported the first steps in enabling many individuals and small businesses to gain access to financial services. Citizen-centric finance, however, needs to empower people as buyers, savers, investors, borrowers and lenders, as well as tax-payers and the users of public services and infrastructure.

***Systemic change can be triggered by advancing catalytic opportunities.*** The pursuit of ambitious opportunities is likely to catalyse the evolution of an SDG-aligned financing ecosystem. Systems are path dependent. Repeated consideration of the SDGs in financing decisions creates new norms of behaviour and drives the creation of new forms of enterprise and financial products which may be ultimately scaled through enabling rules. Kenya's M-Pesa, for example, was launched into largely unprepared financial markets, governance arrangements and technological infrastructure. Its rapid success in itself catalysed the development of many new financial services and enabling rules and governance arrangements. Digital foundations, such as digital ID and even basic infrastructure, are not therefore always well developed in advance of such opportunities but are catalysed by their very presence. Developing countries, often unencumbered by legacy systems, can be agile at developing and encouraging innovation.

## Exhibit 11: Task Force's Action Agenda

The Task Force's call to action is to harness digitalization in creating a citizen-centric financial system which advances financing for the SDGs.



The Task Force makes three, interconnected sets of recommendations:

- **Advance catalytic opportunities** to deliver financing for specific sustainable development goals.
- **Build foundations for sustainable digital financing ecosystems**, including:
  - infrastructure: accessible, affordable connectivity, digital ID and data markets.
  - planning, institutions, and learning: developing national and in some cases regional ecosystems that steer the evolution of SDG-aligned digital financing.
  - capabilities: building people's capacity to benefit from online connectivity and digital finance, ensuring rights and protections.
- **Strengthen inclusive international governance** to develop policies, regulations, standards and corporate governance arrangements at the international level, suited to securing SDG-aligned global digital financing platforms and markets.



A series of **pathfinder initiatives** have been developed in association with the Task Force to exemplify how the recommendations might be implemented.



**Robust, accessible, affordable and secure digital foundations are a pre-requisite to citizen-centric, SDG-aligned finance.** This includes the core digital connectivity and payments infrastructure, digital IDs, and data markets that enable financial innovation and low-cost service delivery.

**Emerging digital financing ecosystems need steering to align with local, national and regional sustainable development priorities.** Governments, market facilitators, established financial institutions and newcomers, and civil society groups have largely pursued digitalization of finance as a means to modernize, boost efficiency, and expand the reach of financial services separately from sustainable development objectives. Digitalization's potential is much greater. If steered appropriately, it can help integrate local, national and regional SDG priorities into the heart of private and public decision-making about financial flows.

**Empowering citizens in financing decisions requires investment in individual and collective capabilities, rights and protection.** Citizens need to have adequate options and be informed, able and willing to act on timely, relevant information, in choosing what to buy, and as borrowers, savers, investors, and tax-payers. Supporting informed choice is one of the greatest challenges in establishing citizen-centric finance. Achieving even basic financial literacy has proven a challenge in most countries.<sup>317</sup> All the more so when citizens are faced with an information blizzard from the market as well as from opinion-setters about the causes and consequences of environmental and social challenges and solutions.

**International financial governance needs to support citizen-centric finance.** International standards and norms shape global finance, and so also the basis on which citizens act, as well as how the SDGs may be directly factored into financing and monetary decisions. Such standards and norms already seek to secure financial and monetary stability, market integrity, and consumer protection. Moreover, financial inclusion, preventing financial crime, taxing multinational businesses, and more recently green finance and climate change have become legitimate topics for international cooperation by central banks, governments and financial regulators. The Network of Central Banks and Supervisors for Greening the Financial System has encouraged its members to integrate sustainability factors into their portfolios, including their own funds, pension funds and reserves, without prejudice to their primary mandates.<sup>318</sup> Under Argentina's Presidency, the G20 for the first time considered the nexus of digital finance and sustainability.<sup>319</sup>

Deeper advances are urgently needed for broader consideration of the SDGs in international financial rule-making. Digitalization offers powerful opportunities through increasing returns to scale. Emerging digital finance platforms achieve global reach and carry cross-border implications for citizen's choices and countries' development. A principles-based approach is needed to govern such platforms in ways that align with citizen's needs and the SDGs.

**Action is needed by diverse actors, often working in unfamiliar configurations.** Gone are the days when finance could be governed independently of the consideration of longer-term sustainability. Yet information, capabilities, interests and authorities are widely dispersed, at best only suited for addressing yesterday's financing challenges. Augmenting and connecting the dots between such capabilities is critical to financing the SDGs.

The basis of financing decisions is evolving from top-down analysis to bottom-up data analytics and human-centred approaches reflecting citizen's concerns, as savers, policy-holders and tax-payers. Financial innovation is rising to the challenge of integrating science and citizen's feedback into new products, services and enterprises. Likewise, advancing the Task Force's call to action into practice requires the reframing of many governance norms that have too often sought to strictly delineate regulation from policy, market from policy innovation, and both from citizen action. Central banks cannot leave inequality and climate change, for example, to their social development and environmental policy counterparts.<sup>320</sup> Regulating digital currencies, similarly, should not be too narrowly focused on financial stability and money laundering only.

***The UN has a critical role to play.*** The Task Force's recommendations can be embedded into the UN's support to Member States. Support will be most helpful in building SDG-aligned digital finance ecosystems, linked to existing SDG-related planning frameworks and initiatives, public financial management and action on combatting illicit financial flows. It will also be key in ensuring that no country or group is left behind and that the digital dividend benefits all.

The UN makes a key contribution to international norm-setting, through its specialist entities that work at the nexus of digital and finance, and through its engagement with the G20, OECD and the Bretton Woods institutions. Finally, the UN can exemplify a citizen-centric approach to financing the SDGs in its management of international development finance, including its own financial management.



# CATALYTIC OPPORTUNITIES



***Catalytic opportunities are game-changing in both delivering financing and shaping finance.***

The Task Force has highlighted the importance of advancing catalytic opportunities for harnessing digitalization in aligning financing with the SDGs. Each can repurpose and redirect significant financial flows towards financing the SDGs. Beyond this, they can be catalytic in triggering broader, systemic changes by driving innovation, disrupting stagnant

markets, undermining rent-taking, increasing accountability, and encouraging governance innovations.











***The Task Force has identified five catalytic opportunities*** for harnessing digitalization in accelerating financing of the SDGs. Taken together, they cover much of global finance, from the vast pools flowing through global financial and capital markets, to public finance that makes up a major part of the global economy, to the aggregated potential of citizens' savings and consumer spending, and the lifeblood financing for the employment and income-generating world of SMEs. These opportunities are systemically-important, but are by no means exhaustive, and are intended to inspire further work in identifying additional opportunities.



***Pathfinder initiatives developed through and with the Task Force exemplify how to realize such catalytic opportunities.***



# Exhibit 12: Catalytic Opportunities

Opportunities	 <p><b>Channel domestic savings into development financing</b></p>	 <p><b>Enhance financing for small and medium-sized businesses (SMEs)</b></p>	 <p><b>Digitalize public financing and make public budgets and contracts transparent</b></p>	 <p><b>Embed SDGs into decisions financial and capital markets</b></p>	 <p><b>Shape consumption decisions through improved information and choice architecture</b></p>
Scale	<p>Global savings pool has grown over two decades from <b>US\$7.5 to US\$23.3 trillion</b>.<sup>321</sup></p>	<p>Potential to meet the <b>US\$5.2 trillion</b> a year needed for SME financing in developing countries.<sup>322</sup></p>	<p>Governments in developing countries could gain <b>US\$220-\$320 billion</b> annually from digitalizing payments.<sup>323</sup></p>	<p>The outstanding value of global equity and bond markets is <b>US\$185 trillion</b>.<sup>324</sup></p>	<p>Annual global consumption expenditure is <b>US\$47 trillion</b>.<sup>325</sup></p>
SDGs					
Citizens as...	<p>Small savers and co-beneficiaries of sustainable infrastructure</p>	<p>Borrowers, entrepreneurs, employees</p>	<p>Tax-payers, voters, public service users</p>	<p>Savers, investors</p>	<p>Consumers, asset owners</p>
Next Steps	<p>Policy makers should form national coalitions with infrastructure, finance and payment platform businesses to build 'low-cost-high integrity' digital financing solutions to enable micro-savers (including women and youth) to finance local, sustainable infrastructure.</p>	<p>Policy makers and regulators should encourage market innovation to develop SME lending and investment platforms, which integrate sustainability criteria and client protections, and avoid algorithmic discrimination against women-owned businesses.</p>	<p>Policy makers should make commitments and work with civil society and the private sector to increase transparency of public finances and use open government data to pursue SDG priorities.</p>	<p>Regulators should set requirements for pension and insurance companies to consult policyholders on the use of funds and publish stress tests of all material SDG-related risks and impacts.</p>	<p>Policy makers should work with industry and provide incentives to encourage and facilitate sustainable choices by consumers and enable digital markets for sustainable assets.</p>

## 8.1 CHANNEL DOMESTIC SAVINGS INTO DEVELOPMENT FINANCING



**The aggregate global pool of domestic savings has grown over the last 20 years from US\$7.5 trillion to US\$23.3 trillion.**<sup>326</sup> Domestic savings in least developed countries

alone has grown from US\$13 to US\$218 billion over the same period.<sup>327</sup> Digitalization allows micro-savings from the informal sector to become part of the formal financial system and gives those already using the financial system more options. This raises the possibility of increasing the proportion of long-term development financing needs being met from domestic resources through accessible savings products linked to local sustainable investment. This has potential to reduce the cost of capital, international debt burdens, and vulnerability to foreign exchange movements.<sup>328</sup>

**Bangladesh is exploring how to harness digitalization to channel domestic micro-savings into investments in sustainable infrastructure, and then use blockchain to improve the effectiveness and accountability in the use of funds.**



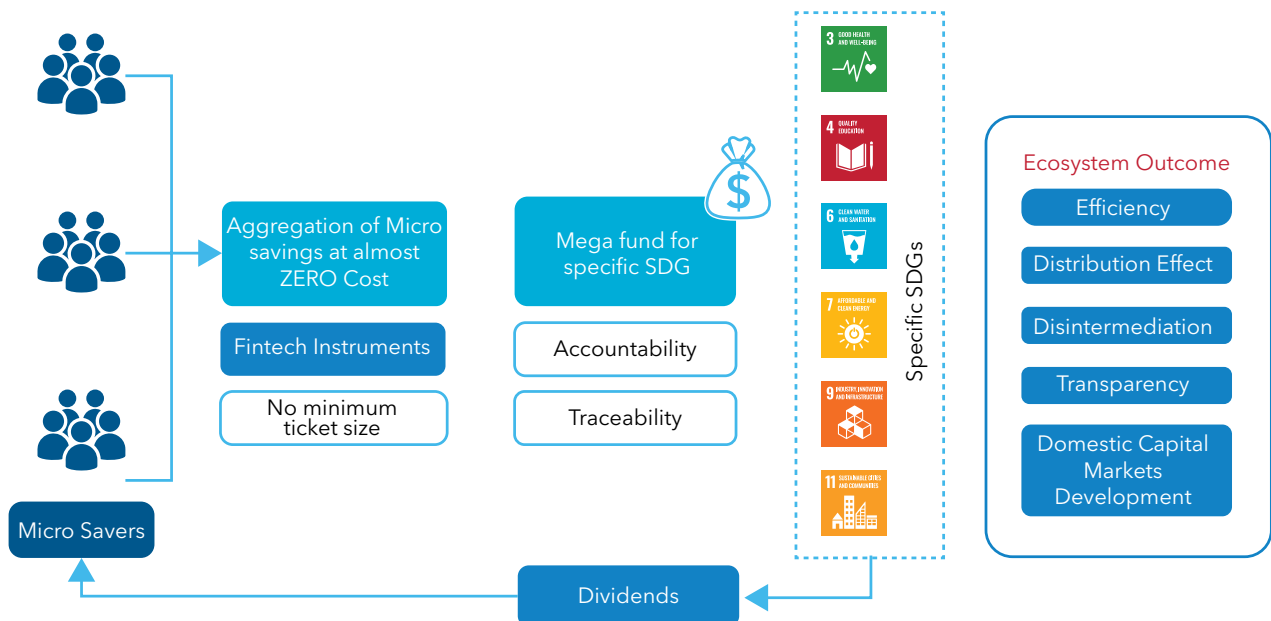
### PATHFINDER

Bangladesh: Catalysing local sustainable infrastructure investment

Domestic savers could choose SDG projects from which they would benefit; the approach could deliver significant reductions in the cost of capital, and economic multiplier effects as dividends flow to poorer Bangladeshi citizens.

### Exhibit 13: Bangladesh Pathfinder Concept

Fintech transforms micro saver to micro investor accelerates lower cost development finance and positive distribution effects



The Bangladesh pathfinder initiative plans to use mobile payment platforms to aggregate small savings, drawing inspiration from early experimentation by the Central Bank of Kenya's M-Akiba retail bond.<sup>329</sup>

## Exhibit 14: M-Akiba

M-Akiba is a Government of Kenya issued retail bond that seeks to enhance financial inclusion for economic development. Money raised from issuance of M-Akiba shall be dedicated to infrastructural development projects, both new and on-going.



### Save Money

M-Akiba is making savings more convenient and easier by providing you with a unique opportunity to save money through your mobile phone while at the same time earning very attractive interest rates from the Government.



### Make Money

More ideas for your money. With M-Akiba, you can now participate in trading of government's retail bond and make money. Buy and sell Government securities in primary market.



### Build Kenya

M-Akiba bond means that infrastructural and developmental projects can be executed at lower costs because the cost of funding for these projects will decline. By investing in M-Akiba bond, you will be building Kenya

Source: <https://www.m-akiba.go.ke/>

Domestic savers would be able to choose which SDG project they want to invest in, such as particular roads or bridges, sanitation systems or hospitals, giving them the benefit of investing in improvements to their area, which will also pay back in savings of time and money, and improved standard of living. Pooled savings would then be used to finance much-needed SDG-related projects that generate dividends. Investments in local infrastructure will also need to overcome challenges of corruption and lack of trust. Technology solutions such as blockchain, together with public transparency offer the potential to improve effectiveness and accountability in the use of funds.

The potential gains for Bangladesh are significant, as they could be elsewhere.<sup>330</sup> Bangladesh needs to invest an estimated US\$67 billion a year in various projects to meet its sustainable development goals, with about half of current financing coming from international sources. International finance is already costly compared to domestic capital, with its relative costs projected to increase as Bangladesh moves to middle income status and loses access to concessionary finance. The envisaged approach could reduce the need for international borrowing, improving the country's investor rating. The dividends would be returned to Bangladeshi citizens with associated equity and economic multiplier effects.

**NEXT STEPS:** Policy makers should form national coalitions with infrastructure development businesses, financing institutions and digital payment platform operators to explore the potential for 'building low-cost-high integrity' digitalized financing value chains that extend from the micro-saver through to the target for development financing.

## 8.2 ENHANCE FINANCING FOR SMALL AND MEDIUM-SIZED BUSINESSES



**SMEs are critical to inclusive economic development.** They account for 70 percent of employment globally,<sup>331</sup> and between a quarter of GDP in lower-middle income countries and over 50 percent of GDP in most OECD countries.<sup>332</sup> Financing SMEs has to date remained an intractable challenge.<sup>333</sup> The World Bank estimates a shortfall in SME financing in developing countries of US\$5.2 trillion a year.<sup>334</sup>

**Ecommerce and digital payment platforms provide data on SME financial profiles that can revolutionize lending** both by existing banks and new entrants. With this data SMEs can be given automatic credit ratings, allowing for rapid lending without collateral. MYbank, for example, has used such data driven ratings to disburse over US\$290 billion to 17 million SMEs in China as of June 2019, 80 percent of which were first-time borrowers.<sup>335</sup> In Thailand SCB Abacus the advanced data analytics subsidiary of Siam Commercial Bank has started to use non-traditional data to provide loans to SMEs borrowers with limited credit history.<sup>336</sup>

Regulatory changes are needed to enable savings and liquidity to be mobilized more effectively for lending. Currently mobile money floats sit in escrow accounts with banks and are only used for liquidity. This money can be more efficiently mobilized to build credit markets and enable savers to earn a return. This requires fuller licensing of 'virtual banks'. The Hong Kong Monetary Authority granted eight virtual bank licenses in the first half of 2019. Singapore will be issuing up to five digital banking licenses to non-bank players. Malaysia released its virtual banking licensing framework in December 2019 and Thailand is studying the possibility of licenses for digital banks. For growing enterprises access to equity capital is also needed.



**PATHFINDER**  
Zimbabwe: Growth  
Enterprises Market SME  
listing platform

In one of the **pathfinder initiatives** catalysed by the Task Force, Zimbabwe's leading payments platform, EcoCash, has designed and piloted a world-first stock exchange that draws on payments data to provide robust due diligence and credit ratings for prospective listings.<sup>337</sup> It provides a much needed debt and equity financing window for Zimbabwean SMEs operating in difficult economic conditions.<sup>338</sup> To date around

300 companies, including federated groups in agriculture, have been preselected for due diligence towards listing and over two dozen have been successfully listed.

**NEXT STEPS:** Policy makers and regulators should encourage market innovation in data-driven lending, equity and debt platforms, integrating broader sustainability criteria into financing criteria, and ensuring that algorithms are unbiased in their treatment of women, minority groups and/or other ethnic, religious and social groups and their enterprises.



## 8.3 CREATE 'VIRTUOUS TRUST CYCLES' IN PUBLIC FINANCING



*The IMF has estimated the value from digitalizing government payments in developing countries at US\$220-\$320 billion annually or 1.5 percent of revenues.*<sup>339</sup> Digitalization also improves efficiency of government transfers to citizens; in Brazil,

switching from cash to electronic cards for distributing the Bolsa Familia social welfare payments led to a seven-fold reduction in administrative costs from 14.7 percent to nearly 2.6 percent.<sup>340</sup> The digitalization of social protection programmes can positively impact the way women participate in economies, and should be based on gender-responsive policy design and implementation.

***Greater transparency in the use of funds through open budgets and open contracts increases citizens' confidence.*** For example, tax revenues as a share of GDP increased by 13 percent in Georgia and by 6 percent in Rwanda, following significant reductions in corruption.<sup>341</sup> The Least Developed Countries could leapfrog siloed legacy systems and implement whole-of-government, integrated, use-case based approaches promoted by ITU's SDG Digital Investment Framework.<sup>342</sup>

Digitalization can enhance ***public resource mobilization***: digital tax collection can plug leaking holes,<sup>343</sup> advanced analytics can flag corruption risks,<sup>344</sup> digitalization can encourage businesses to formalize (and pay tax),<sup>345</sup> and extra revenues can be raised through taxes from digital goods and services.<sup>346</sup>

***Yet there has been only modest progress made in creating such 'virtuous trust cycles'***, despite existing use cases, estimated benefits, and on-going efforts of operational programs by the World Bank, international civil society organizations, funders such as the Open Society Foundation and Luminate, and multi-country platforms such as the Open Government Partnerships.<sup>347</sup> Change in this field is a 'work-in-progress', with significant investments needed in infrastructure, institutional change and the development of new capabilities.

Overcoming resistance to greater transparency is also part of the challenge.<sup>348</sup> Citizens need to not fear retaliation, to have their voice to be represented (e.g. civil society) and aggregated (i.e. coalitions) effectively, and authorities require capacity to address claims while mitigating the risk of simply reconfiguring corruption.<sup>349</sup> Those at the forefront of initiatives to 'open government' are increasingly shifting away from a 'data first' approach towards an approach which starts with particular problems or challenges and considers the prevailing power dynamics and how information can create coalitions for reform.<sup>350</sup>

**NEXT STEPS:** Policymakers should make commitments with roadmaps and milestones to accelerate practical transparency of public finances including publishing budgets, contracting and spending information as open data. They should work with civil society to focus open government initiatives on pursuing SDG priorities.

## 8.4 EMBED SDG DATA INTO FINANCIAL AND CAPITAL MARKETS



**Billions of decisions made annually determine the allocation of over US\$380 trillion of financial assets worldwide.**

The outstanding value of global equity and bond markets is US\$185 trillion.<sup>351</sup> Over the past decade informed citizens have driven demand for sustainable investments reaching over US\$30 trillion in 2018,<sup>352</sup> green bonds so far issued for over US\$770 billion,<sup>353</sup> and impact investing estimated at US\$715 billion in 2019.<sup>354</sup> 'Gender lens' investing is also a growing trend.<sup>355</sup> One recent study found that retail investors account for a disproportionate share of impact assets under management,<sup>356</sup> attesting to people's preferences for making a positive difference with their resources. Another recent retail investor survey in the US revealed that 84 percent of investors want to align their investments with their values, and virtually all believe that sound ESG practices can lead to higher long-term returns.<sup>357</sup>

Emergence and popularity of sustainability and socially themed robo-advisors reflect citizen interest and preferences for meaningful investment options from both risk and impact perspectives, although in many markets stricter standards are needed to avoid 'greenwashing' and 'pinkwashing'.<sup>358</sup> With the Bank of England estimating that up to US\$20 trillion of assets could be wiped out if the climate emergency is not addressed effectively.<sup>359</sup> Climate and other environment-related data is the most important hotspot in this landscape, prompting Refinitiv to launch the Future of Sustainable Data Alliance.<sup>360</sup> Enhanced disclosure is increasingly a core listing requirement, alongside the growing volume of 'use of proceeds' bonds.

The UN Global Compact has developed a framework for the issuance of SDG bonds, linking interest payments directly to achievement of SDG goals.<sup>361</sup> By quantifying SDG impacts and integrating metrics and reporting into bond contracts they seek to connect investors demand for SDG themed bonds directly to business KPIs.<sup>362</sup> Energy company ENEL issued the first such bond in 2019, which promises to pay an interest penalty if the company does not meet renewable energy and greenhouse gas conditions.<sup>363</sup> While such SDG bonds raise funds for large corporations, a new generation of SDG bonds could be envisaged that leverage digital technologies to aggregate millions of smaller projects for capital market access.

**Digitalized data, supported by increasingly complex machine-driven analytics should incorporate sustainability considerations.**<sup>364</sup>

So-called 'alternate data' is becoming more important, particularly environmental data emanating from large biophysical data sets managed by public institutions.<sup>365</sup> Standardization is critical for large-scale applications across global financial and capital markets, making initiatives such as the European Commission's Taxonomy for Sustainable Activities<sup>366</sup> and the Task Force on Climate Related Financial Disclosure<sup>367</sup> particularly important. Leveraging new data sources, progress on taxonomies, standards and analytical frameworks for assessing SDG-related risks and impacts will be key in offering transparent options and empowering citizens to direct how their resources, stored in pension, insurance and sovereign wealth funds, are invested. Citizens' authority overuse of their funds is key to transforming financial and capital markets to take SDG considerations into account.

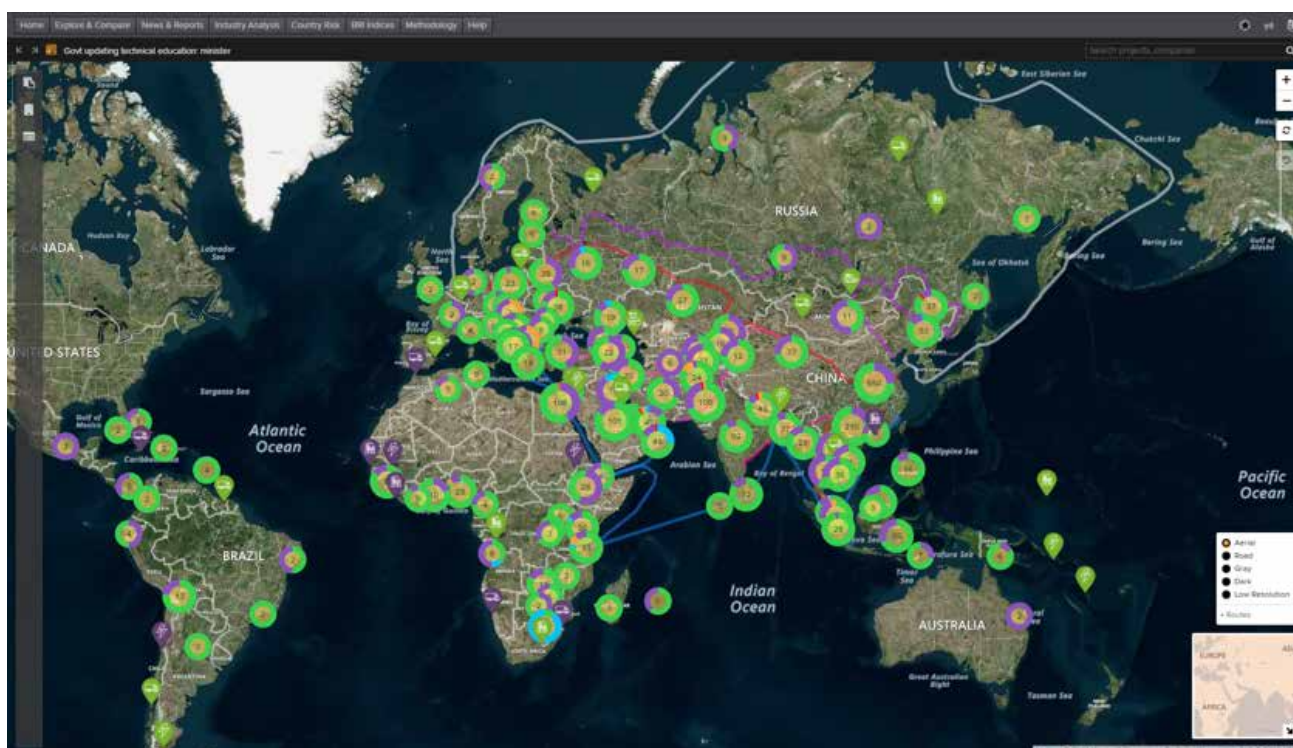


**PATHFINDER** Digital  
Governance of  
Infrastructure

Applying such analytics to project financing is particularly challenging, especially as it relates to infrastructure investments needed to support economic development and the SDGs.<sup>368</sup> Refinitiv, one of the Task Force's key knowledge partners, is taking forward **a Digital Governance of Infrastructure initiative 'Infrastructure 360'**. This initiative is a response

to the unprecedented growth and demand of new international infrastructure development programmes across the world. It provides trusted information and insight on over 60,000 projects globally, integrating 25 years of data on project finance, deals, loans, due diligence, risk profiles and macroeconomic, geopolitical and operational risk with ESG metrics. This initiative includes projects on solar, wind, ports, airports, roads, and railroads as well as logistics, tourism, retail and real estate to help investors, governments and citizens make sustainable investment decisions.

## Exhibit 15: Refinitiv Mapping of Infrastructure Projects



Source: Refinitiv presentation to the Task Force

**NEXT STEPS:** Regulators should accelerate mandatory disclosure requirements to, and of, lenders and investors, and ensure that pension and insurance policy holders as intended beneficiaries are legally entitled to be consulted in the use of funds, and that financial institutions are required to publish balance sheet stress tests of all material SDG-related risks and impacts.

## 8.5 ENCOURAGE SUSTAINABLE CONSUMPTION



***Citizens' spending is part of financing for sustainable development.*** People's spending on goods and services is conventionally excluded from analyses of finance. Yet such expenditure, amounting to US\$47 trillion globally in 2018,<sup>369</sup> is a keystone in determining what gets produced and consumed and where investments go.

Digitalization provides new payment pathways for consumer spending, some 1.9 billion mobile subscribers have used mobile to purchase goods and services in 2018.<sup>370</sup> Ecommerce reached US\$3.5 trillion in 2019 and expected to grow to US\$5 trillion by 2021, with fastest predicted growth in developing countries.<sup>371</sup> Digitalization is also a game-changer for many small businesses, which can use ecommerce platforms such as Alibaba, Jumia and Amazon to overcome challenges of small, local markets and limited outreach capabilities. Moreover, digitalization has opened the way for a rapid growth in so-called 'pay-as-you-go' approaches to providing energy and other infrastructure-intensive utilities and public services.

Digitalization can play the role of influencing citizens' consumption behaviour.<sup>372</sup> Ant Group has experimented with this through its 'Alipay Ant Forest' platform that has attracted over 550 million Chinese users taking greater account of the carbon content of their consumption behaviour, now extended to a comparable experiment in the Philippines.<sup>373</sup> Building on this experience, Mastercard has announced a similar initiative, giving any Mastercard issuer the ability to let their cardholders monitor the carbon footprint of their purchases.<sup>374</sup>

WeBank in China has created the "Measurable Ethics: Rating, Incentivization, Tracking & Supervision Framework" (MERITS) which aims to apply digital technologies to measure, record, and validate acts of positive social and environmental behaviour. It seeks to incentivise small but positive social and environmental behaviours. It sees MERITS being issued, earned, traded and redeemed for rewards in a system of social markets.<sup>375</sup>

**NEXT STEPS:** Policymakers should incentivize innovation and industry alliances that transparently facilitate and reward sustainable choices by consumers, create conditions for digital markets for fractionalized ownership and trading of sustainable assets.



# BUILDING SUSTAINABLE DIGITAL FINANCING ECOSYSTEMS



Sustainable Digital Ecosystems

***Harnessing digitalization to develop a citizen-centric financial system to accelerate financing for the SDGs requires the development of digital financing ecosystems.*** Governments and regulators are seeking to support digital financing ecosystems through infrastructure development, active industry engagement, supportive regulatory frameworks and demand side capacity building.<sup>376 377</sup> There is an opportunity and need to align these national approaches with countries' sustainable development priorities.

and need to align these national approaches with countries' sustainable development priorities.

## Exhibit 16: Digital Foundations



Digital infrastructure  
Digital ID  
Data frameworks

- Universal broadband connectivity
- Ubiquitous digital payment infrastructure
- Open, interoperable digital payment rails
- Universal, secure and private digital IDs
- Citizen-empowering data sharing mechanisms
- Standards and systems for collecting and analysing SDG relevant data



Institutional mechanisms

- Integration of national plans and digital finance
- Institutional mechanisms for incentivizing the development of SDG-aligned digital financing
- Measurement, assessment and learning framework for continuous steering



Citizens rights & capabilities

- Consumer protection arrangements fit for digital age
- Citizen awareness and capabilities development plans

## 9.1 PEOPLE-CENTRIC DIGITAL INFRASTRUCTURE, ID AND DATA



***Provide affordable, accessible and available digital infrastructure to ensure universal coverage and access to the digital world.*** Digital payment infrastructure is

critical for citizens to participate in digital financing and perform cheap, fast, reliable financial transactions.<sup>378</sup> In particular this should target those currently excluded through lack of any technical access options, amounting to some 750 million people.<sup>379</sup> However, many more, around 3.3 billion people in 2018,<sup>380</sup> have technical access but do not use the internet. This is a matter of cost versus value to the user, their capabilities, social norms and cultural barriers, which disproportionately affect women's access to and use of mobile technology.<sup>381</sup> The promotion of digital and financial inclusion for women and other excluded groups should be a specific policy objective.<sup>382</sup>

***Undertake legal reforms to enable digitalization of financial system.*** These include principles defining the legal nature of digital assets, the rules governing making of digital payments, digital assets taxation regimes and private law governing relations between commercial parties. While pursuing digital inclusion and innovation, regulations also have to provide consumer protection and ensure cyber security.<sup>383</sup> The Alliance for Financial Inclusion facilitates peer-learning to strengthen regulatory oversight and has published a practical framework for inclusive digital financial transformation.<sup>384</sup> Rules that enable open, interoperable digital finance rails, through open APIs, can minimize friction on financial flows, prevent market fragmentation, reduce rent-taking, and ease the development and scaling up of digital financing innovations. In developing markets, payment infrastructure such as cash-in-cash-out networks may also extend the reach of digital financing.<sup>385</sup>

***Universally-available, reliable, secure, private, unique digital IDs are critical to enabling people to access digital finance.***<sup>386</sup> Core to enabling people to realize value from the internet is their ability to validate and share their identity and their data when they need to, and to keep it private when they don't. Robust ID systems are critical to preventing identity theft and fraud, reducing transaction costs and improving ease of use and quality of service.<sup>387</sup> Currently more than a billion people lack this basic enabler.<sup>388</sup> Much is being done and has been achieved on digital ID. For example, multilateral and philanthropic institutions continue to refine characteristics of 'good digital ID' to avoid risks such as exclusion, fragmentation, discrimination, repressive surveillance, and fraud.<sup>389</sup> Financial institutions that are already trusted data custodians and veteran risk managers are investigating how to expand access to digital identities through technology.<sup>390</sup> The HLP highlighted human-centric digital IDs as a means for people to regain control over their personal data and share the data dividend.<sup>391 392</sup>

***Finally, data to inform individual, private and public financing decisions and enable innovative digital financing business models must be available.*** For finance to address SDG challenges requires access to personal, financial, socio-economic, and environmental data. Sex disaggregated data is particularly important. Data sharing mechanisms that enable safe, equitable, transparent, individual-controlled access to personal data are key to building trust, developing healthy data markets and ensuring that digital financing solutions can be developed and used by all. Advancing such mechanisms might require more coordination among a broader set of national and international regulators. Digital financing requires access to data that goes beyond personal data. Access to relevant, high-quality, accessible, usable financial, socio-economic, and environmental data is critical.<sup>393</sup> Open or common data pools, such as the World Bank Sovereign ESG Data Portal<sup>394</sup> and open data standards can facilitate access to data.





**PATHFINDER** The Gambia: Accelerate digital financial inclusion

The **Gambia pathfinder initiative** is focused on advancing financial inclusion by ensuring a supportive policy environment and promoting private sector investment in digital infrastructure and citizen-centric, innovative digital financing products and services. The initiative is driven by Task Force members EcoCash, UN Women and GSMA with support from UNCDF.

## 9.2 INSTITUTIONS FOR INTEGRATING SDGs INTO DIGITAL FINANCING



**Countries need robust, dynamic planning for financing needs associated with SDG priorities, related to specific economic sectors, public services and infrastructure.** Planning approaches may be national or regional, such as the EU's Green Deal Investment Plan and Just Transition Mechanism.<sup>395</sup> Or they may draw on international frameworks, such as those linked to the climate-related Nationally Determined Contributions (NDCs), and the UN's Integrated National Financing Frameworks for Sustainable Development.<sup>396</sup>

Planning approaches may be national or regional, such as the EU's Green Deal Investment Plan and Just Transition Mechanism.<sup>395</sup> Or they may draw on international frameworks, such as those linked to the climate-related Nationally Determined Contributions (NDCs), and the UN's Integrated National Financing Frameworks for Sustainable Development.<sup>396</sup>

**Establish institutional mechanisms for incentivizing the development of SDG-aligned digital financing.**<sup>397</sup> Existing mechanisms range from SDG-focused digital finance incubation hubs,<sup>398</sup> regulatory sandboxes<sup>399</sup> to SDG-linked digital finance enterprise funds, incentives and partnerships. In particular, these arrangements can ease discovery, experimentation and adoption of SDG-related digital financing innovations by private sector actors. Advancing such approaches might require multi-stakeholder coordination across multiple regulatory domains,<sup>400</sup> including telecom and data regulators, and fiscal and competition authorities. Examples include the UK FCA's Green Fintech Challenge,<sup>401</sup> IMF's Anti-Corruption Challenge,<sup>402</sup> GSMA's Mobile for Development Innovation Funds.<sup>403</sup>



**PATHFINDER** East Africa: Regional digital financing ecosystem

Digitalization drives increasing returns to scale, which in turn requires access to larger markets. Building local demand and encouraging widespread adoption of digital financing by users and incumbent financial sector players may require either deepening of domestic markets or a regional approach. For example, **the Central Bank of Kenya is working to foster a regional digital financing ecosystem.** MTN,

a pan-African mobile money provider is transitioning to an open platform-based model, which will allow innovators to develop and distribute services to their user base to boost customer activity, improve loyalty and diversify service offering.<sup>404</sup>

**Adopt a framework for diagnosing, monitoring and learning how the nexus between digital financing and SDGs evolves.** Assessments are already available, for example, on progress on the SDGs,<sup>405</sup> some on SDG-aligned financing,<sup>406</sup> and on financial market development,<sup>407</sup> public financing,<sup>408</sup> and digitalization.<sup>409</sup> A measurement framework is needed to help financial and non-financial policymakers, regulators and market actors make sense of progress being made, and needed, in harnessing digital financing for the SDGs. Progressing along these lines, the UNCDF has developed the Inclusive Digital Economy Scorecard.<sup>410</sup>



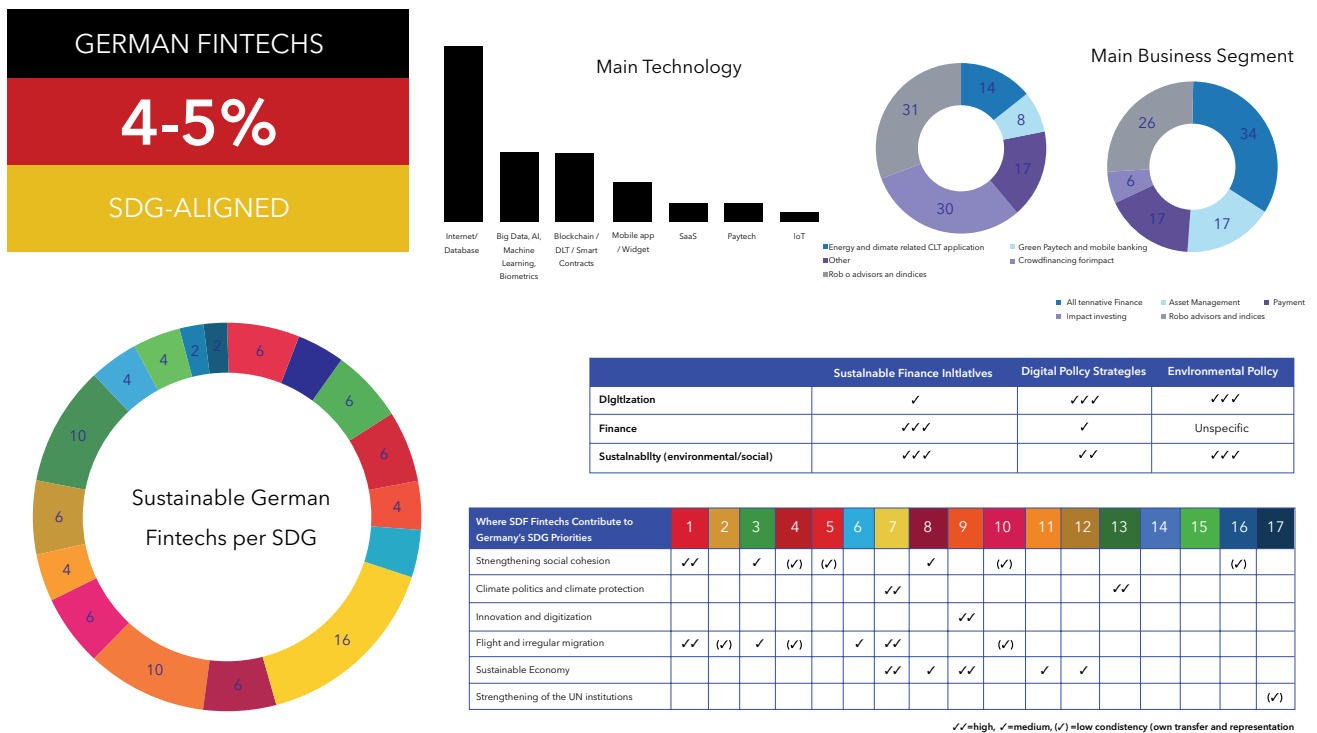


**PATHFINDER**  
Sustainable Digital  
Finance Measurement  
Framework

A Task Force-linked pathfinder initiative has been developed by the Green Digital Finance Alliance (GDFA).<sup>411</sup> The **Sustainable Digital Finance Measurement Framework** assesses three key elements of sustainable digital financing ecosystems: (i) digital and data infrastructure, (ii) policy and regulatory guidance, and (iii) applications that unlock financing for SDGs at national level. The Framework is modular and can be integrated

into existing planning tools and frameworks. Information gathered helps shape policy and regulatory design aimed at aligning digital finance with national SDG priorities and generate knowledge around sustainable digital finance practices.<sup>412</sup>

## Exhibit 17: Sustainable Digital Finance Measurement Framework Example



Source: GDFA presentation to the Task Force



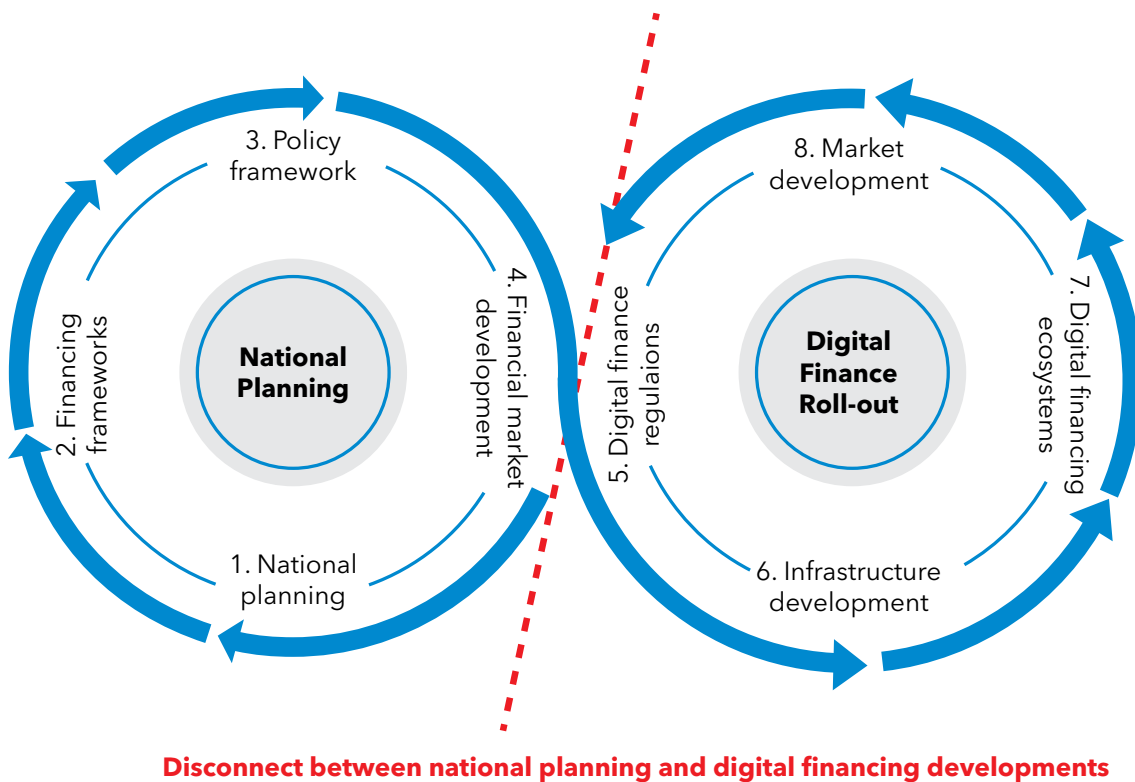
## 9.3 DEVELOPING CAPABILITY



**Empowering people to participate in and shape digital financing ecosystems** as

consumers, savers, taxpayers, borrowers, investors and service users is critical. This builds on the basics of digital infrastructure, digital ID, and ownership and control over personal data, and on the availability of relevant, affordable, user-friendly SDG-aligned products and services.

### Exhibit 18: Building Sustainable Digital Finance Eco-Systems: Connecting the Dots



**Disconnect between national planning and digital financing developments**

Source: UNCDF/UNDP



# Exhibit 19: Building Sustainable Digital Financing Ecosystems

Element	 <b>Core Digital Foundations</b>	 <b>Digital Financing Ecosystems</b>	 <b>Citizen Rights and Capabilities</b>
Recommendation	<p>Accelerated investment in citizen-centric digital finance that must include universal, affordable, accessible connectivity;<sup>52</sup> universal secure, private, portable digital IDs,<sup>53</sup> open interoperable payments and data networks<sup>54</sup> and citizen controlled personal data and decision-relevant SDG data.<sup>55</sup></p>	<p>Develop national sustainable digital financing ecosystems that integrate SDG priorities and planning with the governance and market development of digital financing solutions.</p>	<p>Invest in the capabilities and rights needed to empower citizens in making individual and collective decisions regarding the use of their money, in particular those most left behind (women, youth, displaced, aged).<sup>56</sup></p>
Next Steps	<p><b>Priority actions should include:</b></p> <ol style="list-style-type: none"> <li>1. Accelerate existing investment programs in digital infrastructure, particularly leveraging COVID-19 stimulus-related learning and investments.</li> <li>2. Converge on standards for a 'good' digital ID and relevant certification and safeguards.</li> <li>3. Extend data governance discussions to a broader set of regulators, including financial, telecom and data regulators, competition and tax authorities, and key market players.</li> <li>4. Develop comprehensive data privacy and protection legal frameworks.</li> <li>5. Develop a country-based index that provides visibility on, and supports systematic planning for, citizen-centric and open market qualities of digital foundations.</li> </ol>	<p><b>Priority actions should include:</b></p> <ol style="list-style-type: none"> <li>1. Integrating SDG goals into financial inclusion, digital economy, and digital finance strategies and planning.</li> <li>2. Build SDG-related guidance and incentives into fintech innovation hubs and communities.</li> <li>3. Strengthen awareness by central banks and financial regulators of the linkage between SDGs and digital financing, drawing SDGs into regulatory sandboxes.</li> <li>4. Establish a platform for financial players and private sector to discover, test, invest in and consume SDG-aligned digital financing innovations.</li> <li>5. Build and converge on a common framework for assessing the alignment of digital financing developments with SDG priorities.</li> </ol>	<p><b>Priority actions should include:</b></p> <ol style="list-style-type: none"> <li>1. Develop a coalition of citizen representatives committed to ensuring citizen voice in decisions of financial intermediaries.</li> <li>2. Financial regulators to extend citizens' rights to information and involvement in financing decisions regarding the use of their money.</li> <li>3. Governments to reinforce their commitments to a goal of transparency of public finance, including budgets, procurement, and spending, and provide roadmaps for achieving that goal.</li> <li>4. Financial regulators and supervisory authorities to develop strong consumer protection frameworks for digital financial services.</li> <li>5. Central banks and financial supervisory authorities to work with financial service providers and consumer protection groups to develop digital financial literacy strategies.</li> </ol>

***Citizen rights to transparent, fair, and appropriate digital financial services and protections against fraud, misuse, discrimination and exploitation must be guaranteed to deliver sustainable individual and collective outcomes.***

People should have the right to access transparent, fair, respectful, appropriate, affordable digital financial services, including payment, savings, credit, insurance, and investment.<sup>418</sup> Associated customer protection measures at a minimum guarantee equitable treatment, transparent disclosure, financial education, responsible business conduct, protection against fraud or misuse, protection of customer data and privacy, complaint handling and redress, and competitive service offer.<sup>419</sup> An evolution of that approach might involve adopting a broader, user-empowering lens and connecting consumer protection and financial stability to individual outcomes and positive collective, sustainable development outcomes.<sup>420</sup> This requires mobilizing policymakers and regulators from various domains to ensure that consumer protection measures address all major risks and have sufficient coverage, and to strengthen citizens' capacity to direct how their money is being used, with strong involvement and commitment from all citizen representatives.

***Developing people's awareness, trust and capabilities is crucial.***




Many have access but lack digital skills or trust in the digital world, especially women, elderly and other disadvantaged groups. National efforts to enhance digital financial literacy for all population groups, including by leveraging technological solutions, are critical to scaling of sustainable digital financing ecosystems. Citizens' awareness of their ability to make SDG-aligned financing decisions comes mainly through markets, communities and families rather than formal training. Marketing of local sustainable development investment vehicles therefore involves familiarising people with new investment products and ideas. Operational capabilities are likely to come through use rather than any classroom training, with strong evidence of generational 'leaps' in such capabilities. Collective capabilities and execution are likely to play an important role, for example at the community and city level, potentially involving trade unions, religious groups and other institutions supporting group action.

**NEXT STEPS:** Building sustainability-aligned digital financing ecosystems requires that many existing, evolving parts are joined up. All countries have financing plans connected to national priorities that reflect the SDGs, as well as often SDG and climate-explicit planning processes. Digitalizing finance is also present in some form in all countries, but rarely connected to the SDGs save for important but limited aspects such as financial inclusion, tax collection and anti-money laundering. Key is to join up these two critical systems, and from that to strengthen them both, iteratively, all while overcoming barriers and addressing emerging risks.



## Exhibit 20: Pathfinder Initiatives

Pathfinder	SDGs	Link to Analysis and Recommendations
<p><b>Bangladesh:</b>  <b>Catalysing local sustainable infrastructure investment</b></p>	<p>Digitalized financing value chain that channels domestic micro-savings into local sustainable infrastructure projects.</p> 	<ul style="list-style-type: none"> <li>Empowers citizens to invest in sustainable infrastructure</li> <li>Aggregates micro-savings into investable capital at low cost</li> <li>Enables long-term finance and ensures retail investor liquidity through product innovations</li> </ul>
<p><b>Zimbabwe:</b>  <b>Growth Enterprises Market SME listing platform</b></p>	<p>Digital stock exchange that enables Zimbabweans to provide long-term financing for local SMEs.</p> 	<ul style="list-style-type: none"> <li>Empowers citizens to invest in local businesses</li> <li>Unlocks financing to SMEs through innovative, data-driven products</li> <li>Deepens digital financing ecosystem in Zimbabwe</li> </ul>
<p><b>Global: Digital Governance of Infrastructure</b></p>	<p>Digital platform with that aggregates 25 years of data to provide trusted information on over 60,000 infrastructure projects globally.</p> 	<ul style="list-style-type: none"> <li>Empowers citizens and intermediaries to track infrastructure project risks and performance</li> <li>Intends to augment standard market data from digitally-enabled alternative sources</li> </ul>
<p><b>The Gambia:</b>  <b>Accelerate digital financial inclusion</b></p>	<p>Collaborative effort to accelerate digital financial inclusion through enabling regulation and digital financial product innovation.</p> 	<ul style="list-style-type: none"> <li>Improves citizens' access and capability to use digital financial services</li> <li>Accelerates digital financing ecosystem development</li> <li>Supports market innovators to develop products aligned to national SDG goals</li> </ul>

Pathfinder	SDGs	Link to Analysis and Recommendations
<p><b>East Africa: Regional digital financing ecosystem</b></p>	<p>Regional digital financing ecosystem that expands the market for financial solutions aligned to SDGs.</p> 	<ul style="list-style-type: none"> <li>• Expands digital financing ecosystem regionally</li> <li>• Promotes regional cooperation and governance</li> <li>• Strengthens citizen and innovator capabilities</li> </ul>
<p><b>Sustainable Digital Finance Measurement Framework</b></p>	<p>Measurement framework that helps policy makers, regulators and financial sector players diagnose, monitor and promote sustainable digital ecosystems.</p> 	<ul style="list-style-type: none"> <li>• Tracks the development of digital infrastructure, policy / regulatory frameworks, digital ecosystem</li> <li>• Integrates SDG considerations into digital finance ecosystem assessment</li> </ul>
<p><b>International Dialogue on Global Digital Finance</b></p>	<p>Global forum that brings voices from developing countries and SDG lens into debates on the future of global digital financing platforms.</p> 	<ul style="list-style-type: none"> <li>• Establishes inclusive space of international cooperation</li> <li>• Integrates SDG considerations into policy and regulatory debates about global digital finance with significant cross-border spill-over effects</li> </ul>



# INCLUSIVE INTERNATIONAL GOVERNANCE



The UN Secretary General's High-Level Panel on Digital Cooperation has pointed to the need for coordinated cross border approaches to knowledge exchange, international approaches to dealing with specific risks, such as algorithmic discrimination,<sup>421</sup> and a more joined up approach in the development of governance principles and institutional arrangements.<sup>422</sup> Based on these recommendations and subsequent multi-stakeholder consultations, the UN Secretary General has recently issued a Roadmap for Digital Cooperation (see Exhibit 21).

## ***Some progress has been made in bringing the SDGs into international financial governance.***

The G20 under China's Presidency in 2016, for example, established the Green Finance Study Group that has helped to shape the development of policies and markets.<sup>423</sup> The Financial Stability Board's sponsorship of the Task Force on Climate-related Financial Disclosure (TCFD) is another case in point,<sup>424</sup> as is the Network of Central Banks and Supervisors for Greening the Financial System (NGFS).<sup>425</sup> Key international financial standards bodies such as the International Organization of Securities Commission (IOSCO) are embracing roles in advancing sustainable finance.<sup>426</sup> The Sustainable Banking Network also includes both central bankers and private financiers.<sup>427</sup>

The coronavirus crisis and subsequent economic shock will be the focus on international cooperation for the immediate future. This is both an opportunity, as it is forcing a search for innovative new solutions and international cooperation to meet people's financial needs digitally, and a risk if the climate crisis, biodiversity, gender equality and other critical areas of the SDGs get moved to the 'back burner'.

Digital is emerging as an important enabler of the international sustainable finance agenda. As the then-IMF Managing Director, Christine Lagarde said in relation to digital finance's potential to open up access to financial services. "All countries are trying to reap these benefits, while also mitigating the risks. We need greater international cooperation to achieve that, and to make sure the fintech revolution benefits the many and not just the few."<sup>428</sup> It has become a key part of the work of the UN Secretary General's Special Advocate for Inclusive Finance for Development, Her Majesty Queen Máxima of the Netherlands,<sup>429</sup> the G20's Global Partnership on Financial Inclusion (GPII)<sup>430</sup> and the Alliance for Financial Inclusion.<sup>431</sup> The G20 under Argentina's Presidency for the first time considered the nexus between sustainable development and digital financing as part of its Sustainable Finance Study Group,<sup>432</sup> building on the exploration under the German G20 Presidency of the use of publicly available environmental data in encouraging the greening of finance.<sup>433</sup> The European Commission plans to integrate digital finance into the second generation of its sustainable finance strategy.<sup>434</sup>



## Exhibit 21: UN Secretary-General's Roadmap for Digital Cooperation

The UN Secretary General's Roadmap for Digital Cooperation<sup>435</sup> lays out eight key action areas:

1. **Achieving universal connectivity by 2030** through establishing targets and metrics; convening investors for financing hard-to-reach areas; promoting transformative initiatives;<sup>436</sup> creating an enabling regulatory environment and integrating connectivity into emergency preparedness and response.
2. **Promoting digital public goods** including open-source software, open data, open artificial intelligence models, open standards and open content aligned with national and international privacy laws, including through the Digital Public Goods Alliance.<sup>437</sup>
3. **Ensuring digital inclusion for all**, including the most vulnerable, through a multi-stakeholder digital inclusion coalition mapping action; collecting data on digital financial inclusion and literacy; and supporting national plans.
4. **Strengthening digital capacity-building** approaches including holistic technical and financial support for digital readiness, strategy and digital skills training through a multi-stakeholder network and a joint facility for digital capacity development.
5. **Ensuring the protection of human rights** through comprehensive guidance from the UN High Commissioner for Human Rights on human rights assessments of using new technologies, and commitments from Member States and industry to place human rights at the centre of legislation, regulation and innovations.
6. **Supporting global cooperation on artificial intelligence** that is trustworthy, human rights based, safe and sustainable and promotes peace through a dedicated multi-stakeholder advisory body promoting best practice.
7. **Promoting trust and security** in the digital environment through a broad and overarching statement that establishes a common understanding and elements of digital trust and security, endorsed by Member States.
8. **Building a more effective architecture for digital cooperation** through reconceptualization of digital governance architecture and enhancing the Internet Governance Forum.<sup>438</sup>

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Source: Adapted from Report of UN Secretary General, 'Roadmap for Digital Cooperation' (New York, 2020).<sup>439</sup>



**A principle-based approach for governance of public and private digital financing would strengthen its alignment to the SDGs.**

The IMF and World Bank-sponsored Bali Fintech Agenda is an attempt to align the evolution of digital finance with the SDGs.<sup>440</sup> Building on this and the experience of the G20's GFPI, a set of principles could be developed to insert the SDGs into international policy and regulatory dialogue regarding digitalization across global finance, public and private. Such an approach could also advance the role of digital finance in existing international efforts around sustainable finance, such as the TCFD, Principles for Responsible Investment,<sup>441</sup> and the NGFS as well as national and regional initiatives with international implications, such as the European Commission's International Platform on Sustainable Finance.<sup>442</sup>



**An inclusive, SDG-aligned approach is needed to the international governance of global digital financing platforms.**

Digitalization creates the potential for increases in returns to scale, and so supports the emergence of monopolies. Some digital finance platforms may become globally significant, as is the case with prominent payment platforms. This could also be the case with global digital currencies.<sup>443</sup> Such platforms would have significant cross-border spill-over impacts. Some impacts are beneficial and planned for, such as reduced cross-border transaction costs. Others might be problematic and not adequately factored into current policy and regulation, such as monetary policy and macro-economic effects.<sup>444</sup>

Developing country participation and voice in the rule setting and standards development processes regarding the governance of digital finance is critical. A number of platforms with mandates to engage global standard setters on behalf of developing countries exist and should be leveraged on. The Intergovernmental Group of Twenty-Four is mandated by its developing country Finance Ministry and Central Bank membership to contribute developing country perspectives into G20 and other international processes. The Alliance for Financial Inclusion is mandated by its membership of developing country central banks, financial regulators, and government ministries from more than 90 countries to represent experiences and challenges of its membership in international fora such as the G20 as well as through formal representation at standard setting bodies such as the Financial Action Task Force (FATF) and Bank for International Settlements (BIS). The World Bank also plays a supporting role in advocating for the perspectives of developing countries and their citizens in international standard setting bodies, for example through Enhanced Cooperation Arrangements with the BIS.



**PATHFINDER**  
International Dialogue  
on Global Digital  
Finance

A pathfinder initiative has been launched under the leadership of Kenya and Switzerland. **The International Dialogue on Global Digital Finance** seeks to facilitate a balanced and more inclusive dialogue, particularly involving developing nations, on SDG-aligned governance of global digital financing platforms. It will convene representatives from central banks,

finance, trade and other relevant ministries, cross-sector regulatory bodies, LDCs and non-state actors from developing countries, and representatives from key institutions such as FSB, BIS, IMF, World Bank and Global Partnership for Financial Inclusion affiliated entities. A complementary initiative, the platform will provide a means for advancing consensus on policy and regulatory responses to the development of global digital financing platforms appropriate for developing contexts and economies. It will also seek to catalyse governance innovations that improve consideration of the SDGs, and will explore ideas and potential for collective action by developing countries to harness digital finance in leapfrogging towards sustainable development.<sup>445</sup> The initiative is co-chaired by the UNDP Administrator and the Governor of Central Bank of Kenya and is hosted by UNDP and UNCDF.



**Corporate governance innovations can ensure that SDG considerations are taken into account.** ‘Public utility’ corporate governance arrangements could complement policy and regulatory measures in strengthening the SDG-alignment of global digital financing platforms.<sup>446</sup>

Historically, the ‘public utility’ element of businesses, especially water, electricity and railway companies, was safeguarded through a mixture of policy, regulation, and corporate governance and ownership. How best to govern large digital platforms has become a major topic of public debate, demonstrating a need for governance innovations.<sup>447</sup> Digital companies are increasingly making investments in soft or non-fiduciary governance innovations, such as Facebook’s newly-convened Oversight Board, to strengthen oversight and sustain their license to operate.<sup>448</sup> Reuters, one of the earliest global media and communications groups, adopted the Trust Principles in 1941 when it became a publicly traded company on the London Stock Exchange and Nasdaq, along with a unique corporate governance arrangement, given the name ‘Reuters Founders Share Company Limited’, that continues to exist and operate today.<sup>449</sup>

**NEXT STEPS:** Leverage the Task Force pathfinder initiative to integrate SDG considerations into digital finance governance and regulations at national, regional and international levels. UN Secretary General to call on corporate and financial sector leaders to introduce governance innovations that ensure effective integration of SDG concerns into company strategies and operations.

Element	 <p><b>Principles</b></p>	 <p><b>Inclusive Rule-Setting</b></p>	 <p><b>Governance Innovations</b></p>
Recommendation	<p>Develop a set of principles that guide national and international rulemaking and also directly market behaviour in aligning digital financing with the SDGs.</p>	<p>Ensure a more effective, permanent voice of developing countries in the development of governance of digital financing, particularly pertaining to global digital financing platforms that will have cross-border spill-over impacts.</p>	<p>Develop and deploy corporate governance frameworks to secure ‘public utility’ aspects of digital financing platforms that are large, market dominant, and have cross-border spill-over effects.</p>
Next Steps	<p>UN with Bretton Woods institutions to advance such a set of principles in consultation between policy makers, regulators, international organizations, fintech companies and financial institutions, draw on existing principles (e.g. Bali Fintech Agenda) and to be adopted by key international platforms, such as the G20.</p>	<p>Establish a platform led by developing country policymakers and regulators to engage with international rule and standard-setting bodies shaping the next generation of governance of global digital financing actors. It should leverage existing platforms for developing country engagement with standard setters and include finance, telecommunications, competition, tax and data regulators.</p>	<p>Establish a working group including financial policy makers and regulators, corporate governance groups, public interest bodies and global digital financing platforms to develop and encourage take up of possible frameworks.</p>

## Exhibit 22: How the Recommendations Address the Barriers

### BARRIERS

**Access to digital financial services:** 750 million people lack broadband connectivity, 1 billion lack formal IDs

**Access to data** is critical for financial decision-making and digital financing innovation

**Siloed and non-interoperable IT systems** hinder use of data to price risk, describe impacts and underpin accountability

**Access to appropriate digital financial services:** lack of affordable, secure, relevant digital financial services

**Demand-side inadequate digital and/or financial capabilities,** including illiteracy and poverty and social norms, undermine demand and usage

**Supply-side talent shortage** hinders digital financing innovation, particularly in less developed countries

**Weak regulatory capabilities** undermine the establishment of enabling policy and regulatory environment for digital financing innovation

**Incumbent resistance** to disruption, disintermediation, and digitally-enabled transparency of their activities and rewards

### ADDRESSED BY

Accelerating citizen-centric inclusive digital foundations that advance connectivity, access to digital IDs, interoperable systems and adequately governed data markets, particularly leveraging COVID-19 stimulus packages, addresses the main barriers to digital financing of the SDGs.

Furthermore, progressing incentives and institutional arrangements in support of digital financing ecosystem development will likely drive market and product innovations that serve citizens' needs and interests, potentially enhancing citizen participation in digital financing of the SDGs.

Empowering citizens, individually and collectively, in securing rights and capabilities by advancing digital financial literacy programs, access to information, increased transparency, including addressing barriers for specific groups such as women and older people, can drive greater usage of digital finance and citizen involvement in financing decisions.

Regional approaches to the development of digital financing ecosystems combined with robust governance approaches to oversight of global digital financing platform will stimulate regional cooperation and private sector partnerships which facilitate local talent development and knowledge exchange.

International cooperation in governance and policy dialogue, as well as development of domestic regulatory sandboxes and other tools will build regulatory capabilities.

Deliberate pursuit of catalytic opportunities will result in increased disruption, disintermediation and transparency as digital innovations emerge. Strengthened by adequate regulatory approaches, the potential is there to establish new norms and practices that may lead to overcoming incumbent resistance.

## Exhibit 23: How the Recommendations Address the Risks

### RISKS

**Data security and privacy** risks are amplified as digital financing relies on growing volumes of (personal) data and a handful of IT providers

New **fraud and money laundering**, for example on digital marketplaces, cryptocurrency exchanges, crowdfunding platforms

**Irresponsible digital financial products** with opaque or misleading terms and conditions and insufficient recourse measures

**Data monopolization** or exploitative use of data can stifle future digital financing innovation and undermine consumer trust

**Cybersecurity** creates user and systemic risk in digital financial services as providers resort to cloud infrastructure providers

### ADDRESSED BY

Securing rights and capabilities of citizens by advancing citizen awareness and knowledge building programs, but also ensuring adequate consumer protection mechanisms and enhanced supervisory practices will contribute to reducing fraud and building trust.

Specific attention to data management and data governance, core to the development of robust digital foundations, will help mitigate data privacy and monopolization risks.

Some of these risks will be best addressed by the pursuit of catalytic opportunities, which will drive innovation and the development of the required rules and governance arrangements.

In addition to the above, data monopolization risk may also be addressed by advancing corporate governance innovations and fostering international cooperation on data governance issues. In particular, empowering developing nations to have a say in the governance of global digital financing platforms originating from outside of their jurisdiction will help mitigate adverse effects of such platforms, such as data monopolization.

Advancing international cooperation on the governance of digital finance and in particular BigTech players will help advance solutions to addressing systemic risks caused by these platforms. This would be strengthened by embracing relevant global standards and practices that facilitate information exchange on threats.

## RISKS

**Unfair treatment** can arise from discriminatory algorithms based on biased data or hyper-personalization of financial services

**Short-termism, volatility trading and herd behaviour** has grown with digitalization and algorithmic trading

**Market concentration and rent-taking** derives from ever increasing returns to scale and growing complexity and opacity

## ADDRESSED BY

Development of local regulatory and supervisory capabilities in shaping digital financing ecosystems and addressing the new challenges brought by digitalization is an essential part of advancing digital financing ecosystems. Promoting sandboxes and other regulatory and supervisory technology (RegTech / SupTech) solutions will be essential in mitigating such risks as algorithmic biases.

Catalytic opportunities indirectly alleviate this specific risk by repurposing and redirecting significant financial flows towards long-term, sustainable investments. The emergence of new norms and practices stemming from systematically aligning digital financing ecosystems with sustainable development priorities will further decrease short-termism. The advancement of stress-testing standards and mandatory disclosures might further contain such risks.

The pursuit of catalytic opportunities will drive innovation and undermine rent-taking. Market concentration issues can be addressed through adequate governance arrangements, resulting from greater international cooperation on such governance issues or concerted governance and regulatory approaches among local regulators from different domains.





## NEXT STEPS

### 11.1 IMPLEMENTING THE ACTION AGENDA

***Implementing the Task Force's Action Agenda can close the gap in financing the SDGs.*** The task at hand is to direct financing towards countries, businesses, projects and products that help to achieve the SDGs. The Task Force has developed an Action Agenda to enable the call to action to be ambitiously and effectively implemented, summarized in Exhibit 11. The Action Agenda is multi-faceted and highlights the need to invest more in on-going efforts as well as taking forward an expanded, challenging agenda for change.

The Action Agenda sets out how digitalization can be harnessed to deliver the financing needed by investing in digital infrastructure, encouraging market developments, empowering citizens and securing the necessary governance innovations.

***Realizing the opportunity of implementing the Action Agenda will be a challenge.*** The call is for systemic changes in finance, empowering citizens and enabled by investments and institutional innovations. Digitalization opens the way to this systemic change. Yet it has to be guided to overcome barriers and avoid risks, in order to take advantage of the window of opportunity created by its current, disruptive effects. The ongoing health and economic crisis due to COVID-19 increases the challenges in addressing such long-term needs. At the same time, its impact in accelerating all aspects of digitalization may ultimately make it easier to implement the Action Agenda.

***Every country can and should advance digitally-enabled, citizen-centric financing of the SDGs.*** The call to action and Action Agenda are ambitious and achievable and are relevant to all countries. Specific aspects and focus areas, however, depend on national priorities, the maturity of digital infrastructure, public financing and financial markets, capabilities and financial governance arrangements. There is a sequencing dependent on a country's stage of development:





Every country can and should advance digitally-enabled, citizen-centric financing of the SDGs, with less developed countries being able to harness catalytic opportunities in leapfrogging to more sophisticated, impactful financing arrangements.

- **Less developed countries** might focus on building affordable digital infrastructure, developing digital skills, providing secure digital IDs, and ensuring access to core financial services.
- **Countries that have these foundations in place** might place more emphasis on secure savings, SME borrowing and more transparent and efficient public finance and tax collection.
- **Countries with significant pools of domestic savings** might emphasize new channels for aggregating savings to be used for longer term sustainable development financing.
- **Countries with more sophisticated financial and capital markets** might prioritize improved risk pricing, impact investing, and operationalizing the rights of shareholders and pension policyholders in shaping investment policies.

**International cooperation is essential to harnessing digitalization to finance the SDGs.**

While every country needs robust digital foundations and ecosystems, international cooperation will be of particular importance to different countries.

01

*Some countries will have the local critical mass of scale, entrepreneurial talent, investable funds and technology to advance this agenda with a considerable degree of autonomy.*

02

*Most countries, however, especially smaller, more isolated and developing countries, will need to build international partnerships in securing missing resources and capabilities to advance this agenda.*

03

*All countries, without exception, will need to enter into cooperative arrangements that enable them to learn from experiences elsewhere given the urgency of the SDGs and the dynamic, rapidly changing world of digital financing.*

The UN and other international bodies should develop more integrated, leading edge international cooperation to support countries in developing and implementing strategies and policies that accelerate sustainable digital financing ecosystems.

**Ambitious action requires connecting the dots between several communities across public and private actors.** These actors are too often separated by tradition, inertia and a lack of shared knowledge. Policymakers and regulators, and market and civil society actors will have to work together to realize the catalytic opportunities, evolve sustainable digital financing ecosystems, and build inclusive international cooperation and governance innovations. Advocates of sustainable finance need to get more digital.<sup>451</sup> Digital finance communities and data providers need to get more savvy about sustainable development.<sup>452</sup> Financial regulators need to place more emphasis on the SDGs.<sup>453</sup> Exhibit 24 offers tailored recommendations to different actors.



***We recommend ... a 'Global Commitment for Digital Cooperation' to enshrine shared values, principles, understandings and objectives for an improved global digital cooperation architecture."***

UN Secretary-General's High-Level Panel on Digital Cooperation<sup>450</sup>

More could be done to mainstream the SDGs into digital financing innovation. Regulatory sandboxes and innovation hubs need to place more emphasis on the SDGs that shine a light on tomorrow's market opportunities; one example of this is the Pacific Islands Sandbox.<sup>454</sup> Data providers to the investment community need to make better use of publicly available data to offer their clients better information on SDG-related risks and impacts. Financial regulators are starting to recognize the relevance of climate risks for financial stability, but they have a long way to go to take account of the wider SDG landscape in incentivizing and regulating digital finance.

***Empowering citizens in financial decision-making will not happen automatically.*** The detachment of public and private finance from citizens has become an embedded feature of global finance. There is much to do in overcoming the resistance of those who are sceptical or cynical about citizens being agents of change, or who have vested interests in the status quo. Citizens need to be better educated to make informed decisions. Policy-makers and regulators will need to secure the data flows needed for SDG-aligned digital financing innovation, and the rights and opportunities of citizens in shaping financing decisions. Market actors have a key role to play in empowering citizens by offering specialized products and services.

***Exemplary initiatives, including those the Task Force has catalysed, illustrate potential.*** The Task Force has identified many relevant and inspiring use cases as part of its landscape mapping<sup>455</sup> and has highlighted some of these in its report. It has also catalysed a small portfolio of pathfinder initiatives that particularly exemplify ambitious and innovative action across key opportunity areas and digital foundation recommendations.

Collectively, these initiatives demonstrate how key features of digitalization - more and better data, cheaper transactions and financial intermediation, and innovative financial products - could be harnessed toward financing sustainable development by giving citizens more options to make informed and purposeful decisions.

***The United Nations has a key role to play in implementing the Action Agenda.*** The United Nations, as the champion of financing for the SDGs, has a role in supporting Member States to implement the Task Force recommendations. The UN provides the platform for developing and overseeing on behalf of Member States the implementation of Sustainable Development Goals. As part of this, the Member States have agreed on the Addis Ababa Action Agenda<sup>456</sup> and tasked UN DESA's Financing for Sustainable Development Office<sup>457</sup> to issue annual progress reports. This Task Force, an initiative of the Secretary General,

was established as part of that mandate but without an explicit mandate to identify roles for the UN. That said, UN can play an important part in supporting Member States in their roles in implementing many of the recommendations:

- ***By advancing sustainability-aligned digital financing solutions at the country and regional levels.*** In large part, this will involve a continuation and extension of on-going activities across many UN agencies involved in advancing digital financing solutions at the country and regional levels.
- ***By building international cooperation and governance,*** focused in particular on advancing appropriate governance principles and more inclusive policy and regulatory development.
- ***By exemplifying good practice in transparency and accountability of its own finances*** including those it channels to activities in Member States. The UN channels significant volumes of public finance, largely Official Development Assistance, to developing countries. The Task Force's recommendation to enhanced transparency and accountability public finance therefore pertains to UN's own operations.

Beyond that, the Task Force recommendations may be relevant to the UN in its engagements with many parts of the private financial community, including impact investors, banks, institutional investors and insurers. There would be considerable value in bringing digitalization opportunities into its related programs and initiatives, including its financial sector-specific platforms such as the UNEP Finance Initiative<sup>458</sup> and the Sustainable Stock Exchange initiative,<sup>459</sup> and related platforms such as the Principles for Responsible Investment.<sup>460</sup>



## Exhibit 24: The Action Agenda for Different Actors

ACTORS	KEY ROLES
Policy makers and regulators	Provide standards and regulatory certainty, advance cooperation with innovators, steer market development in support of national sustainable development priorities, empower citizens and mitigate risks brought by digitalization of finance.
Member States, with the UN system	Cooperate to share experience, coordinate and advance ambition and develop common principles and approaches, while building capacity, infrastructure, regulations and industry support at home.
Fintech companies and global digital platforms	Innovate products and services which meet consumer demand to channel finance to sustainable development goals. Commit to principles of SDG-aligned digital financing and develop corporate governance mechanisms to ensure they operationalize them.
Financial institutions	Identify and advance opportunities in own products and systems, advance interoperable digital ID and data systems. Engage with international standard setting and explore corporate governance options for stewarding the SDGs.
International development community	Technical assistance and disseminating learning, supporting governance innovation. Provide support for development of inclusive infrastructure and the capacity of citizens
Development finance institutions	Offer solutions to share risk to enable the development of catalytic solutions. Share knowledge to help governments design risk capital projects aligned to sustainable development and provide incentives via conditionality for corporate governance innovations.
Civil society organisations	Across civic, religious, youth, women's, worker, trader consumer and other interest groups: mobilize collective voice, documenting problems and solutions to hold the powerful accountable. Build the capacity of citizens.
The United Nations	Support Member States in realizing catalytic opportunities and establishing digital financing ecosystems aligned with SDG priorities. Advance inclusive international norm-setting and governance innovations to mitigate risks. Exemplify good practice on digital financing internally. Develop a mechanism for stewarding the implementation of Task Force recommendations.



# 12 EPILOGUE



***Multiple crises and uncertainties characterize the unprecedented state of the world as the Task Force completes its work.*** Human tragedy; the fears of a volatile, indefinite health crisis; the implosion of local and national economies with resulting unemployment, poverty and inequality; an extraordinary scale of fiscal and monetary stimuli by those countries that can afford them, and a public finance and sovereign debt crisis for those which cannot. Amidst such turmoil, the persistent and growing threats of climate change and biodiversity loss; and the challenges in securing the national, regional and international cooperation needed to come through this period and build better, with dignity, humanity and hope.

***Digitalization, already part of our world, has through this crisis come into its own.***

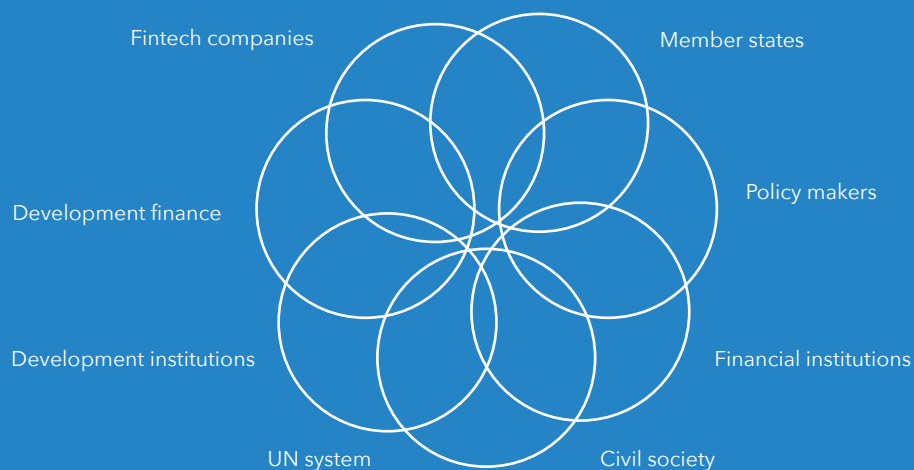
Over 1.5 billion children in 188 countries have been affected by school closures due to the pandemic, with many resorting to some form of online learning.<sup>85</sup> Digital finance in particular has become a lifeline for many, and the positive hotspot of a global economy on pause.<sup>86</sup> Digital rails have become the superhighways for large cash transfers by governments to citizens in the face of income losses associated with mandatory lockdowns.<sup>87</sup>

Online shopping has surged through the crisis, with many surveys pointing to a permanent shift in consumer behaviour towards digital purchases.<sup>88</sup> Customer spending through Amazon has increased during the crisis to US\$11,000 per second, driving the value of the Seattle-based company up to almost US\$1.2 trillion.<sup>89</sup> Alibaba, which emerged as China's leading ecommerce platform after the 2003 SARS outbreak, is now offering billions of dollars in loans to SMEs at a time when many others are retrenching.<sup>90</sup>



***The coronavirus crisis and its economic aftermath have not created but have without doubt super-charged the trends towards digitalization. In this context, the Task Force's mandate and recommendations are more important than ever and represent a more urgent agenda to action.***





*Realizing the opportunity of implementing the Action Agenda will be a challenge. It requires ambitious action, connecting the dots between several communities across public and private actors. Short, specific briefings on the action agenda for seven key sets of actors are available from [www.digitalfinancingtaskforce.org](http://www.digitalfinancingtaskforce.org)*

***Catalytic opportunities for harnessing digitalization to accelerate financing for the SDGs have never been greater.***

Many governments have committed to greener and more equitable, short term public stimuli and bailouts, and longer-term recovery plans, driving impact-focused public spending and investments that will require enhanced transparency and accountability underpinned by real-time, digital tagging and assessment.<sup>91</sup> Sustainability-aligned investments in public traded equities have performed remarkably well throughout the crisis, and are expected to grow rapidly, requiring better data and improved financial products.<sup>92</sup> SME access to finance will be a critical factor in the short and longer-term recovery, with algorithmic lending providing an ever-more important basis for targeting and moving funds quickly and safely.<sup>93</sup>

***Digital risks will also be more present than ever before.***

Access to a phone, a bank account and a digital ID is increasingly core to economic health and for some a matter life or death. Yet one or more parts of this digital survival kit are still unavailable to almost half the adult population, disproportionately women, across most developing countries.<sup>94</sup> The rapid digitalization of public finance makes the need more urgent for robust systems, strong institutions and effective accountability.<sup>95</sup> Cybersecurity and privacy threats represent a growing concern, often affecting the most vulnerable with less advanced capabilities.<sup>96</sup> The accelerated growth of digital financing and global platforms, makes it more pressing to secure the international cooperation and governance innovations needed to ensure that their global, cross-border effects benefit communities in delivering SDG-aligned outcomes.<sup>97</sup>





**SUPPLEMENTARY**

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**INFORMATION**





# ACRONYMS

AI	Artificial Intelligence
AFI	Alliance for Financial Inclusion
APIs	Application Programming Interfaces
ATM	Automated Teller Machine
BIS	Bank of International Settlements
BNDES	Brazil's National Bank for Economic and Social Development
CEO	Chief Executive Officer
CGAP	Consultative Group to Assist the Poor
CMPI	Committee on Payments and Market Infrastructures
CO2	Carbon Dioxide
CORSIA	Carbon Offsetting and Reduction Scheme for International Aviation
ESG	Environmental, Social and Governance
EU	European Union
FATF	Financial Action Task Force
FCA	United Kingdom Financial Conduct Authority
FSB	Financial Stability Board
G20	Group of Twenty
GDFA	Green Digital Finance Alliance
GDP	Gross Domestic Product
GDPR	General Data Protection Regulation
GEM	Growth Enterprises Market
GIIF	Global Index Insurance Facility
GPFI	Global Partnership on Financial Inclusion
HLP	UN Secretary General's High-Level Panel on Digital Cooperation
IATF	UN Inter-Agency Task Force on Financing for Development
ICT	Information and Communications Technology
IMF	International Monetary Fund
IOSCO	International Organization of Securities Commissions
IoT	Internet of Things

IT	Information Technology
ITU	International Telecommunication Union
MAS	Monetary Authority of Singapore
MSME	Micro, Small, and Medium Enterprises
NDCs	Nationally Determined Contributions
NGFS	Network of Central Banks and Supervisors for Greening the Financial System
OECD	Organisation for Economic Co-operation and Development
P2P	Person-to-person
PSD2	Payment Services Directive
SDGs	Sustainable Development Goals
SME	Small and Medium Enterprise
SMS	Short Message Service
TCFD	Task Force on Climate-related Financial Disclosure
TWh	Terawatt-hours
UK	United Kingdom
UN	United Nations
UN DESA	United Nations Department of Economic and Social Affairs
UNCDF	United Nations Capital Development Fund
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNHCR	United Nations High Commissioner for Refugees
UNICEF	United Nations Children's Fund
UNSGSA	UN Secretary-General's Special Advocate for Inclusive Finance for Development
US	United States
USMCA	United States, Mexico and Canada Agreement
VAT	Value Added Tax
WFP	World Food Programme





# GLOSSARY

**Application Programming Interfaces** (APIs) allow different companies' software to interact so that customers can be offered a seamless service using data and technology from different providers.<sup>474</sup>

**Artificial Intelligence** applies advanced computer science techniques to carry out tasks traditionally requiring human sophistication to obtain insights from large, disparate data sets.<sup>475</sup>

**Big data** refers to large volumes of different types of data, produced with high velocity from many and varied sources (such as the internet of things, sensors, social media, financial markets data, transactions data), which can be conveniently stored on the cloud and processed, often in real time, by technological tools (superfast computers, software and algorithms).<sup>476</sup>

**Big Fintech** refers to large digital financing platforms that benefit from increasing returns to scale, amass large volumes of personal data, and exhibit cross-sectoral and cross-border spillover effects, including but not limited to the tech giant entering finance.

**Cloud computing** refers to shared pools of hardware comprised of computer networks, servers, data storage and applications software that can be rapidly mobilized through the Internet. Cloud computing minimizes fixed costs on hardware and other complementary investments.<sup>477</sup>

**Crypto-assets** are digital assets recorded on a distributed ledger.<sup>478</sup>

**Digital financing** is broadly defined as financial services delivered through digital processes and infrastructure.

**Digitization** is the shift from paper to digital format.

**Digitalization** is the shift from manual to automated processes. Furthermore, it is the integration of digital technologies into everyday life by the digitalization of everything that can transition from analogue to digital.

**Digitalization of finance** comprises the systemic changes to the financial ecosystem, aided by fintech, that lead not only to the digitalization of finance-related activities, as well as the broader associated changes in business models, products and services, but also to changes in the real economy, monetary systems, governance models, and citizens' relationships with finance and the real economy.

**Distributed Ledger Technology** uses independent computers to record, share and synchronize transactions in their respective electronic ledgers instead of keeping data centralized. Blockchain is a type of distributed ledger, which organizes data into blocks that are chained together in an 'append-only' mode.<sup>479</sup>

**Financing** includes processes of buying and selling, procurement, contracting, saving, credit, investment, and insurance. People undertake financing individually and collectively, and through recognized intermediaries, notably public institutions and private intermediaries operating across financial and capital markets.

**Fintech** is technology-enabled innovation in financial services that could result in new business models, applications, processes or products with an associated material effect on the provision of financial services.<sup>480</sup>

**Internet of Things** (IoT) refers to objects that "talk" to each other, such as sensors, appliances, smartphones and wearables, which collect and transmit data.

**RegTech** are solutions to support businesses meet their regulatory compliance obligations. Such as customer due diligence, risk management and regulatory reporting.<sup>481</sup>

**Robo-advisors** are applications that combine digital interfaces and algorithms, and can also include machine learning, in order to provide services ranging from automated financial recommendations to contract brokering to portfolio management to their clients. Robo-advisors may be standalone firms and platforms or can be in-house applications of incumbent financial institutions.<sup>482</sup>

**SupTech** are solutions used by supervisory agencies to automate their processes and improve efficiency. The main areas are data collection and analytics.<sup>483</sup>





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