DIGITAL FINANCIAL SERVICES

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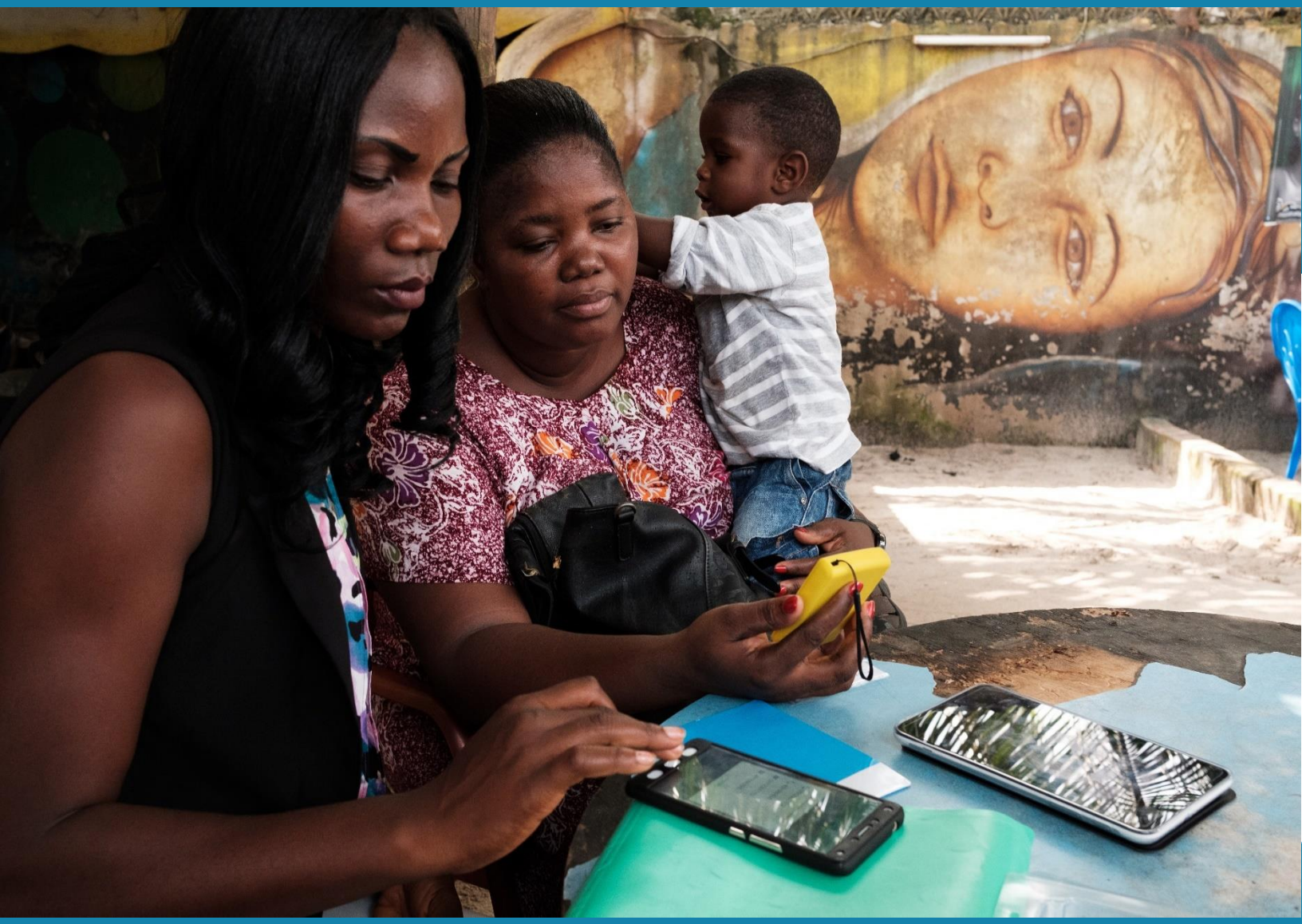

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Foreword

Access to affordable financial services is critical for poverty reduction and economic growth. Countries with deeper, more developed financial systems have higher economic growth and larger reductions in poverty and income inequality. For poor people, access to and use of basic financial services can improve incomes, increase resilience and improve their lives. Women especially benefit.

Far too many people—65 percent of adults in the developing world—lack access to even the most basic transaction account that would allow them to send and receive payments safely and easily, much less the savings, insurance, and credit services that would help them expand their businesses, mitigate risks and plan for their futures.

Digital financial services, powered by fintech, have the potential to lower costs by maximizing economies of scale, to increase the speed, security and transparency of transactions and to allow for more tailored financial services that serve the poor. This report describes the tools of digital finance, the successful business models and policies for encouraging their growth. It explores risks and challenges of new types of services and the legal and regulatory frameworks needed for confronting them. Finally, it includes country experiences with promoting the expansion of digital financial services and the obstacles along the way.

The current COVID-19 pandemic has amplified the urgency of utilizing fintech to keep financial systems functioning and keep people safe during this time of social distancing, falling demand, reduced input supply, tightening of credit conditions and rising uncertainty. At the same time, these new technologies must be designed and implemented carefully to manage their risks, particularly for the poor and vulnerable, so as not to exacerbate the challenges posed by this crisis. There is also an urgent need for investment in the prerequisites for developing digital financial services, such mobile broadband infrastructure—including in remote areas—expansion of digital identification, and open application programming interfaces. These investments should be complemented with the relevant legal and regulatory frameworks that can allow most people to benefit from digital financial services and ensure a competitive ecosystem.

Fintech is helping governments quickly and securely reach people with cash transfers and other forms of financial assistance and reach businesses with emergency liquidity. It is allowing people to transfer funds—including cross-border remittances—and to pay bills from their home, or in a market or store setting, with limited physical contact. But the potential is much larger than what has been achieved. This crisis has highlighted the benefits of digital financial services in many different dimensions and its critical role in achieving the Sustainable Development Goals.

In this way, increasing usage of digital financial services can hasten resolution of the health emergency, support economic recovery and underpin the return to economic growth. Over the longer-term, it will contribute to economic development and ending poverty. We hope this report will provide valuable insights for policymakers and for financial sector players seeking to expedite financial inclusion and development of digital financial services.

Respectfully,

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Acronyms

ABA	ASEAN Bankers Association
ABL	Asset-based lending
ACH	Automated Clearing house
AE	Advanced Economies
AEPS	Aadhaar Enabled Payment System
AFI	Alliance for Financial Inclusion
AFIN	ASEAN Financial Innovation Network
AI/ML	Artificial Intelligence/ Machine Learning
AMC	Asset Management Company
AML/CFT	Anti-Money Laundering / Combating the Financing of Terrorism
AMU	Airtel Money Uganda
APBS	Aadhar Payment Bridge System
API	Application Programming Interface
AS	Advisory Services
ASEAN	Association of Southeast Asian Nations
ATM	Automatic Teller Machine
BBA	Basic Bank Account
BCC	Banque Centrale du Congo
BCEAO	Central Bank of West African States
BCSBI	Banking Codes and Standards Board of India
BDT	Bangladeshi Taka
BIS	Bank for International Settlements
BMGF	Bill and Melinda Gates Foundation
BNM	Bank Negara Malaysia
BO	Banking Ombudsman (India)
CAK	Competition Authority of Kenya
CBA	Commercial Bank of Africa
CBK	Central Bank of Kenya
CCT	Conditional-Cash Transfers
CDD	Customer Due Diligence
CDG	Center for Global Development
CGAP	Consultative Group to Assist the Poor
CMTF	Mobile Banking Task Force Committee (DRC)
CPMI	Committee on Payments and Market Infrastructures
DB	Doing Business
DBT	Direct Benefit Transfers (India)
DEC	Development Economics Global Practice
DEG	German Investment Corporation
DFI	Development Finance Institution
DFID	Department for International Development (UK)

DFS	Digital Financial Services
DLT	Distributed Ledger Technology
DRC	Democratic Republic of the Congo
EAP	East Asia and the Pacific
ECA	Europe and Central Asia
EM	Emerging Market
EMDE	Emerging Market and Developing Economy
EMI	Electronic Money Issuer
EU	European Union
FATF	Financial Action Task Force
FCAS	Fragile and Conflict Affected States
FCI	Finance, Competitiveness and Innovation Global Practice
FCV	Fragile, Conflict and Violence
FI	Financial Institutions
FICP	Financial Inclusion and Consumer Protection
FIG	Financial Institutions Group
FMI	Financial Management Information
FPS	Fast Payment System
FSAP	Financial Sector Assessment Programs
FSD	Financial Sector Deepening
G2P	Government-to-person
GDP	Gross Domestic Product
GDPR	General Data Protection Regulation
GHC	Ghanaian Cedi
GP	Global Practice
GPFI	Global Partnership for Financial Inclusion
GPSS	Global Payments System Survey
IBRD	International Bank for Reconstruction and Development
ICCR	International Committee on Credit Reporting
ICT	Information and Communications Technology
IDA	International Development Association
IFC	International Finance Corporation
IMF	International Monetary Fund
INFO	International Network of Financial Services Ombudsman Schemes
IPRS	Integrated Population Registration System (Kenya)
IRR	Internal Rate of Return
IT	Information Technology
KCB	Kenya Commercial Bank
KYC	Know Your Customer
LAC	Latin America and the Caribbean
MAS	Monetary Authority of Singapore
MCF	Mastercard Foundation
MEA	Middle East and Africa

MFI	Microfinance Institution
MNO	Mobile Network Operator
MOU	Memorandum of Understanding
MSME	Micro, Small and Medium Enterprise
NBFC	Non-Banking Financial Companies
NFC	Near Field Communication
NFIS	National Financial Inclusion Strategy
NID	National Identity Card (Bangladesh)
NPCI	National Payments Corporation of India
NPL	Non-Performing Loans
NPS	National Payments System
NUUP	National Unified USSD Platform
OCR	Optical Character Recognition
OSDT	Ombudsman Scheme for Digital Transactions (India)
OTC	Over the counter
P2G	Person-to-government
P2P	Person-to-person
PAR	Portfolio at Risk
PBOC	People's Bank of China
PFI	Partnership for Financial Inclusion
POS	Point of Sale
PPI	Prepaid Payment Instruments
PSS	Payment and Settlement Systems (India)
QR	Quick Response
RBI	Reserve Bank of India
RPW	Remittance Prices Worldwide
RTGS	Real-Time Gross Settlement
SDG	Sustainable Development Goals
SME	Small and Medium Enterprises
STK	Sim-Toolkit
STR	Secured Transaction Registries
TA	Technical Assistance
THB	Thai Bhat
UFA	Universal Financial Access
UIDAI	Unique Identification Authority of India
UK	United Kingdom
UPI	Unified Payments Interface
USD	United States Dollar
USSD	Unstructured Supplementary Service Data
WB	World Bank
WBG	World Bank Group
WSME	Women-led Small and Medium Enterprises

Executive Summary

Access to affordable financial services is critical for poverty reduction and economic growth. Countries with deeper, more developed financial systems enjoy higher economic growth and larger reductions in poverty and income inequality. Access to financial services also increases opportunities and resilience for the poor, particularly women. Despite this, 65 percent of adults in the world's poorest economies lack access to even the most basic transaction account that would allow them to send and receive payments more safely and efficiently. These accounts are also the gateway to broader financial services such as savings, insurance and credit. Only 20 percent of adults in developing economies save through a formal financial institution. The remaining savers rely on informal and costlier methods.

Digital Financial Services (DFS), enabled by fintech, has the potential to lower costs, increase speed, security and transparency and allow for more tailored financial services that serve the poor at scale. DFS are characterized by low marginal costs and greater transparency. They can respond to both the supply-side barriers to access to financial services, such as high operating costs, limited competition, as well as the demand-side barriers, including volatile and small incomes for the poor, lack of ID, trust and formality and geographical barriers. Mobile money has leveraged high mobile phone penetration in many developing countries to deliver a 'first wave' of DFS. Today, there are over 850 million registered mobile money accounts across 90 countries, with USD $1.3 billion transacted via these accounts per day. Sub-Saharan Africa has shown itself to be a leader in mobile money, with 21 percent of the adult population having a mobile money account. Sub-Saharan Africa has also shown that these accounts can provide a basis for more sophisticated financial services, such as digital lending and insurance.

The current Covid-19 pandemic has amplified the benefits of expanding DFS, because it significantly reduces the need for physical contact in retail and financial transactions and helps government respond more quickly to extend liquidity to firms and people most at risk. DFS - particularly through the use of mobile money - permit remote payments and transactions, enabling the social distancing recommended to reduce contagion. Through electronic payments, consumers can transfer funds, pay bills and pay for goods and services from their home, or in a market or store setting, with limited physical contact. DFS enable a rapid, secure way for governments to reach vulnerable people with social transfers and other forms of financial assistance, especially during times when transportation and movement around the country is unsafe or limited.

Before the current crisis, it was clear that two use-cases for DFS beyond mobile money—remittances and Government-to-Person (G2P) payments—were particularly beneficial for the poor. Cross-border remittances had been projected to exceed USD $600 billion—more than all FDI and ODA combined—by 2021. The average global cost to send these funds in the form of cash is 6.8 percent. A fully digital transaction drops the cost to 3.3 percent. Since the onset of the crisis, remittances have been falling sharply as major remittance-sending countries experience lockdowns, hitting key service industries where migrants are employed. It is therefore, more important than ever to reduce fees and increase funds available for remittance recipients. For governments issuing emergency funds to citizens and businesses, Digital financial services can strengthen accountability, improve the ability to track where government funds are spent and eventually evaluate the impact of interventions. Leakage, due to corruption and theft, can be reduced through digital payments so that intended beneficiaries receive the full value of funds they are due.

DFS can also help firms address liquidity issues, which are critical due to demand, supply and financial shocks due to the current crisis. DFS enable firms to interact with financial services providers, even during times when physical visits are not possible and draw down on existing lines of credit without delays or disruptions. Digital payments, once approved, can be applied quickly to firm accounts. DFS have

also introduced forms of alternative finance that can compensate for a lack of liquidity in traditional financial channels.

Other ancillary and related technological developments have been critical to the development of DFS to date and will likely continue to be so as DFS develops further. Digital ID has enabled financial institutions to onboard customers efficiently and in a way that is compliant with anti-money laundering and other 'know your customer' requirements. Open Application Programming Interface (API) developments have allowed DFS providers to access data from different public and private systems to improve the speed, and reduce the cost, of providing DFS without compromising safety and reliability.

DFS are also enabling entirely new business models that bring additional services to the poor. Large e-commerce platforms and telecom operators have leveraged the ability of DFS to facilitate payments to offer services such as 'pay-as-you-go' solar energy, insurance and lending. For example, Ant Financial's "310" loans require three minutes to apply, one second to approve and zero human interaction. Platform-based models for trading supply-chain invoices have enabled MSMEs to leverage their receivables to access working capital. Basic digital insurance products have emerged in Africa and South-Asia.

While many countries have begun to address the basic enablers for DFS to sustainably reach scale, DFS requires a more robust set of enabling factors to be in place to ensure financial integrity, stability and competition. These policy enablers can be divided into three categories: conducive legal and regulatory frameworks; enabling financial and digital infrastructure; and ancillary government support systems. Addressing these three areas requires policymakers to look at a wide range of critical issues. These include:

- how to enable basic digital connectivity and mobile-phone penetration;
- whether and how to permit non-banks to have access to national payment infrastructure and to issue electronic money;
- how to enable and regulate widespread 'agent networks' that meet the need for the cashing-in and cashing-out of digital accounts because most economies remain cash based;
- rolling out digital and biometric ID systems;
- how to enable access to government data platforms;
- how to ensure competition for DFS, considering dominant platforms which engage in DFS;
- and how to regulate non-traditional players that offer financial services.

In addition to the enablers that facilitate DFS, policymakers need to consider the risks posed by DFS and address them accordingly. While the benefits of financial services for the poor are well documented, they introduce risks to users and to the broader financial system. For users, data privacy concerns arise from the data trails created by DFS which can expose them to unauthorized disclosure, misuse of personal data, and discrimination. Unequal access to technology and the 'digital divide' can exclude the poor, particularly women, from DFS. Finally, reaching large numbers of formerly unserved individuals with DFS potentially exposes them to predatory lending and over-indebtedness. For the broader financial system, DFS presents cyber-security and operational risks from activities, such as hacking. Financial integrity could be threatened by use of crypto-assets, pre-paid cards and other tools that may enable individuals to circumvent AML/CFT controls. DFS also pose challenges to competition authorities as large platforms leverage economies of scale and scope to increase concentration and dominate the provision of DFS. Finally, risks at the level of individual institution or infrastructure could spill over to the broader economy and pose macro-financial risks.

Many Emerging Markets and Developing Economies (EMDEs) have robust experience in fostering the development of DFS and addressing its risks. Chapter three of this paper outlines several country case studies and shows the success that countries have achieved in enabling DFS to serve the poor through

specific policy reforms. The case studies identify key policy decisions made, what those decisions enabled, and what other countries might learn from those experiences. Chapter three also looks at the role that the private sector has played in adapting to new regulatory environments to offer DFS to the poor.

The WBG is assisting EMDEs in accessing the opportunities and managing the risks of DFS. The WB is actively working on DFS in over 50 countries, through both lending and advisory instruments, on the full range of DFS activities from digital ID to payments and banking regulation, to digitizing G2P payments. These country activities are often informed by diagnostics (including FSAPs). As countries continue to develop DFS, comparable cross-country data will become critical. The WB has invested in several data sources in this regard, but gaps persist, particularly cross-country data with respect to the usage of accounts and the cost of services beyond payments. IFC continues to invest in fintech – both through innovative startups and through the modernization of incumbents – to expand DFS for the poor. IFC investment and advisory services work to accelerate market and sector level adoption of DFS to create inclusive financial markets through early-stage equity, debt and digital transformation.

1. What are Digital Financial Services and why do they matter for the poor?

1.1 Digital Financial Services and the delivery of efficient financial services in EMDEs

Access to affordable financial services is critical for poverty reduction and economic growth. At the macro level,[1] countries with deeper, more developed financial systems can allocate capital and risks more efficiently and consequently enjoy higher economic growth and larger reductions in poverty and income inequality. At the micro level,[2] financial inclusion—access to and use of basic financial services—can reduce poverty, increase resilience and improve the lives of the poor, women in particular.[3] The channels include *facilitating daily financial transactions*, such as government transfers and other public services, sending money home, paying a utility bill, or receiving wages - instead of using cash which is less efficient, riskier, and requires face-to-face interaction. Financial services help *boost earning capacity* by enabling investments in their education, health, housing, and businesses and *smooth consumption and bolster resilience* to shocks such as disease, job loss or a weak harvest through remittances and basic savings, lending, and insurance products.[4]

Box 1: Definitions

Digital financial services *(DFS) are financial services which rely on digital technologies for their delivery and use by consumers.*

Fintech *refers to digital technologies that have the potential to transform the provision of financial services spurring the development of new – or modify existing – business models, applications, processes, and products.[5] In practice, the term "fintech" is also broadly used to denote the ongoing wave of new DFS. Examples of these technologies include web, mobile, cloud services, machine learning, digital ID, and Application Programming Interfaces (APIs).*

A **Fintech firm** *is a new entrant in the financial sector that specializes in offering DFS. Examples of Fintechs include digital payment providers, digital insurers, digital-only banks, and peer-to-peer lending platforms.*

A **bigtech firm** *is a large company with an established technology platform and user base. Examples of bigtechs are online search engines, social media platforms, e-commerce platforms, hail-riding platforms, and mobile network operators. Leveraging technology and user network effects, several bigtechs have started to offer DFS.*

Yet, many of the world's poor remain financially unserved or underserved. Even for the poor who have access to financial services, these services are often relatively expensive. About one-third of the world's adults still lack access to a basic transaction account. Access to a basic transaction account is critical as it allows people to receive and send payments. It is the first step towards accessing a broader suite of financial services such as savings, insurance, and credit. Moreover, only about a fifth of adults in developing economies are saving through a formal financial institution, compared to more than half in high-income OECD economies. Remaining savers – including many with a transaction account – rely on informal methods which can be costlier, riskier, may lead to abuse, and perpetuate informality. The unmet need for credit of millions of formal and informal Micro-, Small, and Medium-sized Enterprises (MSMEs) in developing economies amounts to almost USD $8.1 trillion or about 40 percent of GDP.[6] Financial services can also be expensive to the poor, especially relative to the transaction size. The average cost of sending home USD $200 in cash remains around USD $14.[7]

Innovations in technology and business models have resulted in the rise of DFS which can lower costs and increase speed, transparency, security, and availability of more tailored financial services that can serve the poor at scale. Digitization can reduce frictions in each step along the financial service life cycle, from opening an account to conducting customer due diligence, authenticating transactions, and automating other, product-specific processes, for example assessing creditworthiness. DFS are therefore characterized by low marginal costs per account or transaction and can bring efficiencies of scale and reduce costs.[8] DFS also enhance transparency, since every transaction generates a data trail. This data trail furthers the ability of financial services to formally develop a credit-scoring mechanism for informal market participants.

On the supply side, DFS are provided by new entrants in the financial sector comprising: fintech firms, such as neo-banks, peer-to-peer lending platforms, and online lenders and platforms that focus on a specific network of customers, such as farmers and bigtech firms, including mobile network operators, e-commerce platforms, social media providers, online search engines. DFS may also be provided by digitally-savvy incumbents, such as banks, insurers, and asset managers. On the demand side, mobile-enabled consumers – younger generations in particular – increasingly demand more convenient financial services through digital channels.

Examples of DFS models that have proven to advance financial inclusion at scale, include:

- *Mobile money.* Mobile technology, along with high phone penetration, underpinned the first wave of DFS services. Equally critical was the development of new business models for mobile money, including e-money issuance and agent networks, and eventual regulatory support for such models. For example, M-Pesa in Kenya allowed the poor without a bank account to digitally store, send, and receive money cheaply through their mobile phones and use agents, like a local shop. to "Cash In, Cash Out" (CICO), so they can participate in the local, still largely cash-based economy of many developing countries.[9] There are over 850 million registered mobile money accounts across 90 countries with USD $1.3 billion transacted per day.[10] Sub-Saharan Africa has come out as a clear leader with 21 percent of the population having a mobile money account.[11] Once mobile money systems reach scale, they can provide a basis for more sophisticated financial services such as digital lending and insurance. For example, as M-Pesa matured it enabled M-Shwari, a digital micro-savings and -credit product which can be opened and used remotely.

- *Platform eco-systems.* bigtech platforms, such as social media, ecommerce, and ride hailing, have enabled new business models and sparked another wave of DFS by leveraging very large user bases and scale economies. For example, Alibaba's ecommerce portal in China provided demand for its own payment service Alipay, which serves around 1.2 billion users. Similarly, ride-hailing service Gojek in Indonesia paved the way for GoPay, initially to support customers to pay their drivers. By leveraging cloud services and machine learning, the consumer data generated on these platforms has enabled a further round of DFS innovation for credit, insurance, and savings which can be accessed through a "super app." For example, e-commerce marketplaces including Amazon, Alibaba, and Mercado Libre provide *credit* to businesses selling on their platforms, based on analysis of merchant cash flows, inventories, *fulfillment* performance, and other metrics.

- *Open Application Programming Interfaces* (APIs) APIs allow different systems to exchange consumer data and instructions. APIs can be particularly powerful for the poor when they are underpinned by a digital ID system and facilitate interactions between governments, businesses, and citizens.[12] For example, in India, the Aadhaar biometric identification system which covers over 1 billion people, provides the foundation for an integrated set of APIs ("India Stack") which, among others, manages secure user consent to share data and enables remote identification and authentication (e.g., eKYC for onboarding[13]) for account opening and financial transactions.[14] More

broadly, APIs can empower consumers and improve competition since market players no longer have a monopoly over consumer data they hold.

Box 2: Global remittances and Digital Financial Services

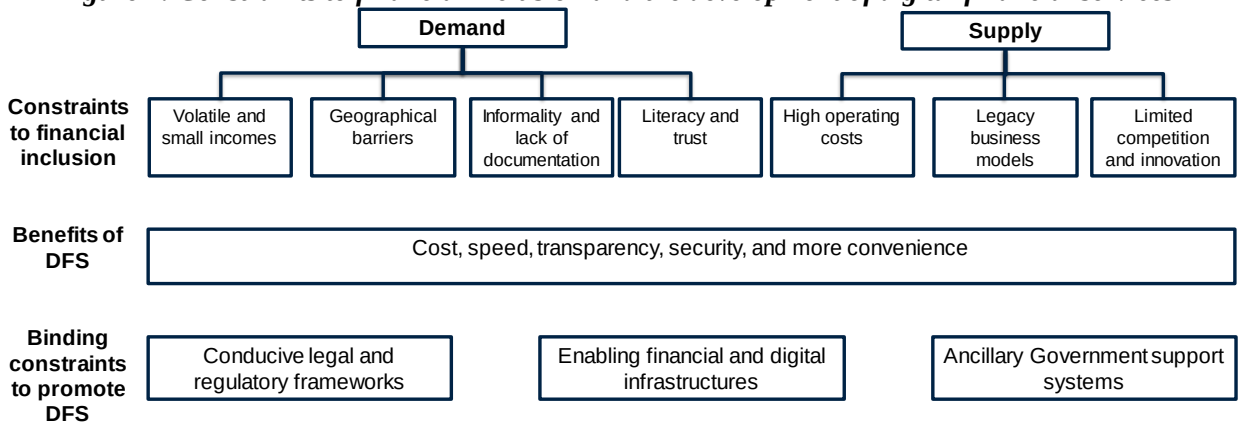
DFS support international remittances, an important source of income for the poor. Before the COVID-19 pandemic, the volume of cross-border remittances to developing countries had surpassed foreign direct investment and was estimated to reach USD $600 billion by 2021. When sending USD $200 home using payment cards or mobile money at the sender side, the average cost falls to about USD $9.20 compared to the global averages of USD $14 when using cash or USD $13.60 when processed through a bank. Remittances fully processed by mobile money operators from sender to receiver cost USD $6.28 – however, this is available in few countries and volumes are still low. New DFS models are emerging which can reduce the cost and time even further. With employment in service industries of major remittance-sending countries hard hit by lock-downs, remittances have fallen sharply and weakened an important safety net for the poor in developing countries. Reducing fees would offset at least a small portion of this decline.

To properly assess and benchmark the state of DFS provision in a country, and to monitor progress over time, there is a need for high quality comparable data across countries. As DFS is broad, spanning multiple providers and regulators, the breadth and depth of data required is large. Several existing databases – described in Annex 1 – provide a piecemeal snapshot of DFS adoption and impact, including transaction costs. Nevertheless, there are gaps in the existing data that would need to be filled to provide a comprehensive measurement of the DFS landscape and the impact of DFS. These gaps, and potential ways to overcome them, are described in more detail in Annex 1.

1.2 Alleviating constraints to financial access: The role of Digital Financial Services

DFS can help alleviate long-standing demand and supply side constraints to delivering affordable and suitable financial services to the poor (Figure 1).

Figure 1: Constraints to financial inclusion and the development of digital financial services



Source: Authors.

Long-standing constraints on the ***demand side*** include:

- *Volatile and small incomes.* The poor require affordable, low-value financial services that allow them to deal with small, unpredictable, incomes earned in the informal and agricultural sectors. Many poor families also rely on small-value remittances and government transfers. DFS can help

through special accounts and pre-paid e-money products that do not carry onerous maintenance and transaction fees or minimum balances, which are common at traditional financial institutions. In developing economies, about two-thirds of adults without financial services cite having too little money as a barrier to account ownership, and roughly one-quarter say accounts are too expensive.[15] In Latin America and the Caribbean, roughly half of adults without financial services say accounts are too expensive. With lower marginal and fixed costs, DFS can be more cheaply delivered. This also allows for transaction-based pricing, which can be more suitable for the poor.

- *Geographical barriers.* In developing economies, roughly one-fifth of adults without financial services cite distance to financial institutions as a barrier to account ownership. The share exceeds 30 percent in Brazil, Indonesia, and Kenya.[16] Through mobile technology and agent networks, DFS reduces the need to travel to financial service centers. DFS allows the poor to conduct financial transactions through mobile devices and use retail agents to send money or convert digital balances to cash.

- *Informality and lack of documentation.* The poor often operate in the informal sector where they lack proper identity verification and leave little trace of their economic activity and assets. This poses challenges to financial inclusion. Almost one-fifth of adults without financial services cite the lack of documentation as a key obstacle to account ownership.[17] DFS can support the undocumented poor by leveraging digital means of authentication and transaction initiation. which reduces costs.[18] Basic, small-value DFS accounts with simplified Customer Due Diligence (CDD) can help overcome the more stringent documentation requirements associated with traditional accounts. DFS can leverage digital transaction data and alternative data sources, such as from social media or e-commerce platforms to overcome information asymmetries. This can compensate for the poor's lack of adequate formal credit histories and financial statements, as well as their limited ability to register collateral, which could have allowed them to access financial services at more suitable terms. As such, DFS offers an opportunity to help reduce informality.[19]

- *Literacy and trust.* Poor, potential first-time users of formal financial services often lack awareness of financial services, as well as the skills to understand and responsibly use them. Indeed, those without financial services are more likely to be less educated, and almost a fifth cite distrust as a reason to refrain from using financial services.[20] Moreover, MSMEs typically exhibit weaker financial management skills. This also poses higher financial risks. Therefore, strong financial consumer protection frameworks and financial literacy are important enablers of financial inclusion.

Long-standing constraints on the ***supply side*** include:

- *High operating costs*. Historically, many incumbents have operated expensive brick-and-mortar networks, maintained outdated core technologies, and relied on costly and time-consuming human and paper processes. These infrastructure and processing costs make small transactions and maintaining low-balance accounts unprofitable.[21] DFS can be automated, tailored to customer needs, and delivered remotely at lower cost, making small-value transactions commercially viable.[22]

- *Legacy business models*. Historically, many incumbents offered standardized financial services, which are more appropriate to serve more affluent individuals and larger companies, since they rely on off-line delivery channels in urban areas and traditional sources of information. However, the poor who have volatile incomes may need more flexibility to extend payments, or to repay when cash is on hand, which may be the same day the loan was taken. DFS are rooted in new business

models, can be delivered at lower incremental cost, and can be designed with the flexibility to better meet the financial needs of the poor.

- *Limited competition and innovation*. Historically, in many developing economies, incumbents have enjoyed considerable market power, protected by barriers to entry through restrictive regulations and a weak startup eco-system. As a result, these financial institutions were free to charge high fees and margins and felt less pressure to invest and innovate to tap into new and under-served market segments. DFS business models enable new entrants to offer bank-like services that compete effectively on both price and quality. Nimble incumbents that focus on digital transformation or partner with new entrants can also increase competition and promote innovation.

To sustainably reach scale, DFS require a strong set of enabling factors to ensure the consumer protection, financial integrity, financial stability, and competition needed to create robust and trustworthy markets that will attract investment and consumer adoption *(See Figure 1 and Section 2 for details)*. The initial DFS business models that have alleviated these constraints responded to demand, as well as market innovation, and were built with basic technologies. Regulatory forbearance and willingness to accommodate innovation has often been more important in the short term than having a DFS-specific regulatory framework. However, over the longer-term, DFS development benefits from: enabling legal and regulatory frameworks which foster responsible DFS innovation; modern, robust, accessible, and interoperable digital and financial infrastructures; and ancillary government support systems.[23]

Basic DFS are already delivering significant financial inclusion benefits and contributing to several Sustainable Development Goals (SDGs). Digital payments have proved to be central to recent advances in access to transaction accounts in many African and South Asian countries and lower reliance on cash. At the macro level, studies estimate that moving away from cash can generate annual gains of up to one to two percent of GDP. DFS-enabled government payments provide cost benefits to both the government and users.[24] They reduce leakage,[25]and can also enable a rapid response to people affected by humanitarian crises.[26] Further, digital payments have expanded access for the poor to essential services like water, solar power (SDG #7 – energy), and remote learning (SDG # 4 – access to education) through pay-as-you-go services. For example, Eneza Foundation's mobile education platform has over 3 million users across Africa, 70 percent from rural areas. Research shows that mobile money services in countries such as Kenya have improved the poor's earning potential (SDGs #2 and #3 – ending poverty and hunger) through better labor outcomes (SDG # 8 – decent employment), particularly for women (SDG #6 – women's empowerment), and boosted their savings.[27]Mobile payments have also made households more resilient to shocks by allowing them to receive financial support from distant friends and relatives, as evidenced in Kenya,[28] Uganda,[29] and Bangladesh.[30] And lastly, research shows that the digital delivery of government payments can reduce corruption[31] and crime,[32] lower administration costs, and reduce travel and waiting costs of recipients.

The potential to add more sophisticated services to the DFS eco-system is significant as economies transition from cash-based to digital. First, two-thirds of the 1.7 billion adults without financial services in the world have a mobile phone, and almost half of the adults in the developing world have access to internet and use social media. In sub-Saharan Africa, smartphone penetration was 39 percent by end of 2018 and is estimated to rise to 66 percent by 2025.[33] Second, the acceptance of digital payments for daily use by merchants will continue to grow as the digital economy develops.[34] This will further reduce the need for physical cash[35] and, together with alternative consumer data and data analytics, enable more sophisticated DFS eco-systems that are built on top of digital payments such as digital credit and insurance.

1.3 Opportunities through new business models

In addition to responding to supply and demand side constraints, DFS are also transforming business models in many areas of finance[36] to better meet user needs, including for the poor. However, the degree of adoption differs across developing countries[37] (Figure 2).

Figure 2: Evolution of financial services as a result of digital technologies and new business models

Source: International Monetary Fund and World Bank Group (2019). "Fintech: The Experience so Far".

Note: This figure maps users' needs for financial services to traditional solutions and emerging fintech solutions. In doing so, it flags the key gaps that technology seeks to fill, and which new technologies are applied in different services. AI/ML refers to Artificial Intelligence and Machine Learning algorithms applied to extract insights from large amounts of data. Data/Cloud Platforms are cloud-based technologies which facilitate exchange of data via Application Programming Interfaces (APIs), across fintech firms, financial institutions, customers, and governments. Access to digital platforms can be secured with digital identification technologies, such as biometrics. DLT/Crypto captures distributed ledgers, such as smart contracts and related decentralized technologies. Mobile refers to feature phones and smartphones running financial apps. The colors scheme reflects a judgement on whether the specific technology has a low (L), medium (M), or high (H) level of benefit for the corresponding fintech solutions. Scaling is purely illustrative.

- *Payments.* Non-bank e-money issuers such as e-commerce platforms or telecom operators with large user bases, for example, Go-Jek, Alibaba, and Safaricom, are enabling digital payments and simple savings instruments using mobile phones, QR codes, and agent networks. The ability to securely send small payments cheaply has made new products and services, such as pay-as-you-go solar, viable for customers in remote areas. Third parties, such as budgeting apps, can now initiate payments of users' bank and payment card accounts or obtain financial transaction data through open APIs to establish consumer consent and promote competition (UK, India, and Mexico).[38] These payment developments are supported by upgrades to payment infrastructures, allowing banks and eligible non-banks to offer 24/7, near real-time payments.

- *Cross-border remittances.* New fintechs such as Transferwise and MFS Africa have extended the money-transfer-operator model for cross-border transfers by connecting to local payment infrastructures and banks or e-money providers on both sides of a transaction.

- *Lending.* Digital credit has already been delivered to millions of poorer households in Kenya, Tanzania, Zambia, and Ghana.[39] Digital lending can be tailored to user needs and facilitated using machine-learning models that leverage alternative data, such as payments, e-commerce, social media, or mobile phone activity, without the need for human intervention. For example, Ant Financial's 310 loans require three minutes to apply, one second to approve, and zero bank staff. Platform-based models for invoice finance have created marketplaces for MSME's receivables, and e-commerce platforms leverage data on sellers to offer working capital. Marketplace lending offers viable alternatives for MSMEs that are left unserved by traditional models. Platform-based models for reverse factoring have create a market place for MSME's receivables.

- *Insurance.*[40] Although less mature than digital payments and lending, basic digital insurance products, including vehicle, travel, and health insurance, that can be tailored to meet specific user needs and be delivered on demand through apps or marketplaces have emerged. Initial innovations were around delivering small-value policies using digital channels to match costs to revenue of such small policies. Basic "insurtech" solutions are available in South Africa and Brazil, but also less developed countries such as Tanzania, Rwanda, and Pakistan. Similar to the case of digital credit, machine-learning models can leverage alternative data, including from telematics and wearables, to make risk classification and product pricing more accurate. Some fintech startups are using satellite data and machine learning to offer digital insurance and loans to farmers.[41]

- *Investment and financial planning*. DFS enable novel ways to invest in instruments such as bonds, mutual funds, or money market funds. For example, Kenya's M-Akiba government bond was issued to small savers who invested via their mobile wallet. Automated services, powered by machine learning, can also offer investment advice and financial planning services to retail investors and MSMEs by gleaning consumer's financial and other data.

1.4 Risks of new models and products

DFS also pose various risks and challenges, including:[42]

- *Data governance and privacy.* DFS revolve around collecting, storing, processing, and exchanging consumer data by a variety of eco-system players. This exposes consumers to the risk of unauthorized disclosure and use personal data and calls for comprehensive consumer data protection frameworks, as GDPR in Europe.

- *Cyber security and operational risks.* DFS may rely on data infrastructures which are vulnerable to cyber-attacks, system failures, and an over-reliance on third party service providers, for example cloud storage and analytics, data provision. This may compromise business continuity and financial stability and is closely related to data governance concerns.

- *Financial integrity.* Some DFS, such as crowdfunding platforms, e-money, pre-paid cards, and crypto assets enable fast and remote financial transactions which enable users to circumvent or evade current controls and can be used for illicit financial activities. The Financial Action Task Force is enabling DFS through specific guidance on digital ID, KYC utilities, and virtual assets,

supported by simplified Customer Due Diligence (CDD) requirements. However, implementation gaps and lags in developing economies are risks.

- *Regulatory arbitrage.* Some DFS have been offered by new unregulated entities, such as peer-to-peer platforms or bigtechs, which have introduced products that fall between cross-sectoral regulatory gaps and reside outside existing legal frameworks. They share similar risks and activities but do not always receive a similar regulatory treatment. This can lead to the buildup of risks outside the regulated system related to stability, integrity, and consumer protection. Furthermore, regulatory arbitrage can create an uneven playing field that can undermine competition and innovation.

- *Macro-financial risks.* Compounded by cyber and operational risks, rapidly growing DFS activity, like digital lending, could pose risks to individual institutions, particularly if they are left unregulated. At the macro-level, these activities could become procyclical and systemic with the potential for disruptive spillovers to the real economy.

- *Fair competition*. Due to economies of scale, reputation, and capital, there is the potential for large DFS platforms and bigtechs to reduce overall competition and increase concentration of risks in the financial sector. In developing economies, bigtechs are already enjoying a dominant position across a range of financial services such as payments, lending, insurance, and investment management.

Moreover, DFS come with risks that can inhibit financial inclusion.

Such risks include:

- *Exclusion.* Unequal access to infrastructure and technology increases the digital divide. Examples include lack of access to basic telecommunication and financial infrastructures, as well ass affordable mobile devices and data-plans. Women and the poor are often disproportionately disadvantaged.

- *Over-indebtedness.* Evidence has emerged that digital credit has led to late repayments and defaults in Kenya and Tanzania, particularly in poorer and most segments of the population, calling for a closer look at digital lending practices.[43]

- *Discrimination*. DFS-linked decision-making tools such as credit scoring may not fully remove biases present in the underlying data, or in the mindset of the people that design these tools, for example prejudices or discrimination against minority borrowers. This may result in unfair segmentation and inappropriate pricing.[44]

- *Unfair practices.* DFS may be delivered with limited electronic disclosure of terms and conditions, agent liability, effective recourse mechanisms, and safety of funds, and may be adopted by newcomers to financial services with little understanding and no face-to-face interaction with providers that might help ensure appropriateness of a product or service. This exposes consumers to abuse, fraud, and operational failures which reduce trust in DFS and undermines their adoption.

- *Data-protection related risks.* Traditionally excluded customers may be more vulnerable to the compromise of data privacy, identity theft, and fraud, because they lack alternatives. The potential for these risks to cause harm is greater where consumers have low levels of financial capability, as is more often the case for the poor.

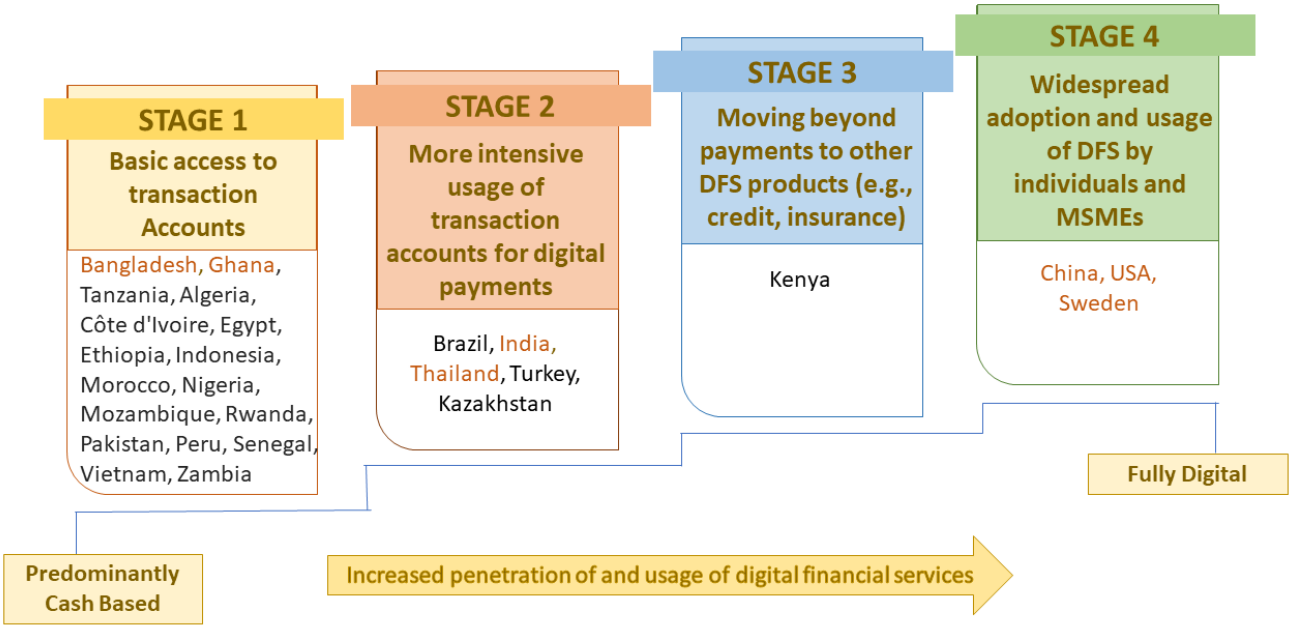
2. What are the binding constraints that policy-makers can address to promote the development and growth of Digital Financial Services?

Figure 1 on page 3 identifies several areas where policymakers can alleviate binding demand- and supply-side constraints that inhibit the safe and efficient development and growth of DFS. These policy foundations can be divided into three clusters:

1) Conducive legal and regulatory frameworks;
2) Enabling financial and digital infrastructure (Payment Systems, Credit Infrastructure, and Digital Connectivity Infrastructure); and
3) Ancillary government support systems (Data Platforms, Digital ID and Financial Management Platforms).

Figure 3 identifies four broad stages of digital transformation in the financial sector—ranging from being predominantly cash-based to fully digital – and offers country examples for each stage. Some of these countries will be discussed extensively in Section 3. The figure 4 shows that along this development trajectory, different policy actions and enablers become increasingly relevant across the three policy clusters for further growth and adoption of DFS.

Figure 3: Development stages of Digital Financial Services



Source: Authors.

Figure 4: Policy Measures at Country Level

Policy Actions and Enablers by Development Stages				
Policy Actions and Enablers	**Stage 1**	**Stage 2**	**Stage 3**	**Stage 4**
Enabling financial and digital infrastructures	• Foster good penetration of mobile phones and connectivity	• Well functioning payment systems and enabling interoperability	• Establish credit infrastructure and enhance coverage of credit relevance data	• Support universal broadband connectivity • High penetration of smartphones
Ancillary government support systems		• Enhance financial management system to support intensive shift of G2P payments to digital	• Establish and expand coverage of digital ID	• Enable automated access to digitized Government data platforms
Conducive legal and regulatory frameworks	• Allow non-bank insurance of e-money • Implement simplified CDD • Enable development of widespread agent network	• Adopt payment systems law • Enable non-banks access to payment systems • Robust consumer protection framework in place • Develop and implement competition policy	• Establish comprehensive regulatory framework for DFS providers • Adopt comprehensive legal measure for data protection and privacy • Enable DFS providers to expose and use APIs	• Adopt legal measures to enable Open banking

Source: Authors.

2.1 Conducive legal and regulatory frameworks

DFS development and adoption requires concerted legal and regulatory reforms, which can be grouped into four main areas: i) enabling new players and new approaches by incumbents to offer DFS; ii) promoting competition and a level playing field; iii) safeguarding consumer protection; and iv) fostering demand for DFS and customer confidence in DFS.

2.1.1 Enabling new players and new approaches

Most EMDEs allow non-banks to offer e-money products. In response to market developments, regulatory changes have allowed many countries to open the provision of e-money by non-bank players, such also mobile network operators. E-money accounts also come with a cap on the total balance and limits on number and value of transactions. Either as a complement or as an alternative to e-money, some regulators have established special types of bank accounts offering minimum services[45] – known as basic bank accounts (BBA). E-money and BBA balances and number of daily transactions are capped, thereby enabling regulators to simplify the CDD requirements. This enables accounts to be opened with just one ID and digital verification of the customer's identity to be done – referred to as e-KYC. Since acceptance of digital payments remains low in many countries, low-income customers require ready and easy access to

cash. To address this, regulators have allowed e-money issuers and banks to use small shops and trusted third parties – "agents" – that are located closer to the customers to facilitate opening of accounts, offer cash-in (deposit), cash-out (withdrawal) services and other ancillary services.

The relatively easy scalability of e-money has attracted many potential new, non-bank entrants to the market. The non-bank entrants are primarily mobile telecom operators, although there are instances of start-ups and joint ventures between banks and technology companies. Regulators have, therefore, had to take on the challenge of determining how to permit the entry to the market and how best to regulate the activities of these new entrants. More broadly, they have had to regulate new DFS products and other innovations, for example, how a process like KYC for an existing product is carried out. The emerging experience with respect to these two related sets of issues are discussed below.

Opening the DFS market to non-banks

The route through which new, non-bank entrants are allowed into the market, particularly for mobile and e-money, has generally followed three approaches: (a) require the non-bank to partner with a bank or other licensed entities; (b) grant a specialized license as a financial service provider; and (c) grant a license to offer financial services under existing non-financial business.

(a) **Partnering with a bank or another licensed entity**: This approach generally does not require any major regulatory changes and simply allows a non-bank entity to partner with a bank or another regulated entity. This approach has worked when the non-bank partner is financially strong and able to take the lead. bKash, which functions as a subsidiary of Brac Bank in Bangladesh, has been very successful as an e-money issuer. In Pakistan, Telenor (a telecom operator) took a stake and partnered with Tameer Microfinance Bank[46] and succeeded with an agent-based banking model. In most other countries; however, this approach has been unsuccessful. Countries such as Ghana, Morocco, and Nigeria had to shift away from this approach, as have Egypt and Ethiopia.

(b) **Specialized license as a financial service provider**: In this approach, regulators create a special licensing category for the provision of DFS services, often by type of financial service, and allow existing non-bank companies (such as a telecom company) to set up a subsidiary or a stand-alone entity to take this specialized license. This approach is also used to allow start-ups to enter the market and in some cases for existing banks to establish subsidiaries to offer specialized services. This approach has been widely used for mobile money and other types of DFS services (see box 3).

Box 3: Examples of countries that offer a Specialized License for DFS

Bangladesh: A separate category for mobile money and a special type of e-money providers that are not allowed to handle cash-based transactions but can offer payments from a e-money account;
EU: new licensing categories for e-money and third-party payment transaction initiation were created;
India: new categories of license for Prepaid issuers, Payment Banks and Data aggregators;
Indonesia: new categories for e-money and peer-to-peer lending platforms;
Jordan: new categories for e-money providers; and
Mexico: Fintech law created specialized license categories for e-money and lending platforms.

(c) **License to a non-financial sector entity:** This approach is uncommon. A well-known example is Kenya where telecom companies offer mobile money services without the need to set up a separate legal entity to offer financial services. From a regulatory perspective, this poses two main risks: the financial sector regulator might not have full powers to regulate and supervise an institution that is not licensed by it, and the regulator might not be able to provide a safety-net to the customers

in case of any business failure or other form of disorderly market exit. Recently in Kenya, steps have been initiated to require non-financial sector entity offering mobile money services to set up a separate dedicated licensed entity for offering e-money services.

Process to arrive at regulatory approach

Regulators have followed three different approaches to developing a dedicated regulatory framework for new entrants, new products and other innovations: a) "wait & see," b) "test & learn," and c) innovation facilitators, including sandboxes. However, some countries, because of local contexts and/or after observing the global developments, have gone straight to adopting regulatory frameworks.[47]

(a) Regulators adopting the "wait & see" approach allow innovative new entrants and business models to function while monitoring the trends from afar, before intervening where and when necessary. Since its inception in 2013, the mobile payments landscape in China was largely unregulated and did not include restrictions such as transaction caps and the need to report transaction details to the bank which held the consolidated prepaid funds. Small step changes in regulatory policies were introduced frequently, such as tightening access to payment licenses, establishing CDD requirements and requirements on renewals. In 2018, recognizing the need for a more fundamental change in regulation, the People's Bank of China (PBOC) implemented a new comprehensive mobile payment regulation. This wait-and-see approach allowed AliPay and WeChat pay to innovate and rapidly grow covering over 900 million users, collectively. This, however, came with risks. Notably, several fraudulent mobile money players entered the market, leading to loss of customer funds. Additionally, the market grew so rapidly that the regulator had to intervene and put in much stronger regulations than seen in other markets, for example, requiring all e-money balances to be maintained with the PBOC.

(b) Another approach - "test & learn" - involves the creation of a custom framework for each individual business case, allowing it to function in a live environment, with close supervisory attention. This was used with resounding success in Kenya for the roll-out of the first mobile money solution. In 2007, when Safaricom approached the Central Bank of Kenya (CBK) with their proposal to set up a mobile phone-based money transfer service, the CBK invoked the *Trust Law* imposing certain conditions on the Mobile Network operators but also initiating the use of a letter of no-objection if the conditions were adhered to. See section 3 for a detailed discussion on M-Pesa service of Safaricom.

(c) In response to the emergence of new DFS models beyond mobile money,[48] some countries are adopting more formalized approaches to facilitating faster market entry of new products and innovations, both by incumbents and new entrants. **However, the results are still developing, and it is too early to draw a definitive conclusion on the outcomes**. These approaches include – innovation hubs (or offices) and regulatory sandboxes. Innovation hubs (or Offices) provides support, advice, guidance and even, in some cases, physical office space, to help them identify opportunities for growth and navigate the regulatory, supervisory, policy or legal environment. In contrast, regulatory sandboxes are a virtual environment created by regulators that enables the live testing of new products or services in a controlled and time-bound manner. In most cases, it is intended for those innovations that do not fit neatly into the current regulatory framework and functions by allowing firms to test, on a small scale, innovative products, services, business models and delivery mechanisms subject to regulatory discretion and proportionality. They have currently been used in over 60 jurisdictions, globally, with mixed results, including smaller economies like Sierra Leone, Rwanda, and Jordan.

2.1.2 Enabling Competition and establishing a level playing field[49]

Enabling entry of new players and new approaches goes a long way towards enhancing competition, but by itself, it is not adequate for ensuring competition. Regulators need to do more to create the conditions for the new approaches and new entrants to credibly compete with incumbents, while ensuring a level playing field and avoiding regulatory arbitrage. On the flip side, DFS by design produces network effects and economies of scale and scope. In the medium term, this could lead to one or a few new entrants cornering the market, resulting in a shift in the market share without any positive impact on the level of competition, perhaps even leading to more concentration.

To reap the benefits of DFS, a lasting commitment to level the playing field in terms of access to data, technologies, and infrastructures is important. At present, incumbents largely control access to critical financial infrastructure (see section 2.2), while technology and communication companies control access to services like communications, data services, e-commerce portals, social media platforms, and search engines. The incumbents could use their control of financial infrastructure to restrict access to new entrants, while telecom and communication companies could leverage critical technology services and data to offer financial services and restrict incumbent financial institutions access to them.

Regulators and policymakers are encouraging establishment of new open infrastructure or are reviewing and changing the access criteria for critical financial infrastructure. The Central Bank of Mexico, for example, is allowing non-banks to access the payments infrastructure. Peoples Bank of China is allowing non-bank credit providers to access its credit registry. In other cases, regulators are requiring operators of financial infrastructure to open access to non-banks. Reserve Bank of India required access to payment infrastructure for non-bank e-money issuers. In some cases, new open infrastructures are being created which would be open for all DFS players – for example, in Pakistan and Sierra Leone.

Regulators are also requiring the access criteria for critical telecom and other data platforms to be fair and transparent. Mobile money in many EMDEs is based on SMS text messages and USSD services[50] that are controlled by telecom operators. In countries where telecom operators are also mobile money issuers, access to USSD can be used to constrain competition. In Kenya, the Competition Commission compelled Safaricom, which was offering DFS via M-Pesa, and other telecom operators to increase transparency of, and lower prices for, USSD services. Financial sector regulators in many countries are supporting access for DFS providers to government data platforms like ID systems. Bangladesh Bank supported banks and other DFS providers to get access to the ID system managed by Election Commission. Regulators increasingly are taking the stand that data of customers held by social media, ecommerce platforms and other digital platforms belong to the customers and that customers should be enabled to access it. This opens the opportunity for the DFS providers with customer consent to leverage this data for providing financial services.

Going further, to break the hold of incumbents, regulators in Advanced Economies (AEs) and larger Emerging Markets (EMs) are embarking on regulatory reforms called "Open Banking" to allow third parties, acting on behalf of customers, to directly access account information held by incumbent institutions and initiate transactions. The United Kingdom (UK) and European Union (EU) are at the forefront on this and many AEs and larger EMs like Mexico, India, and Turkey have followed suit. The EU created a new licensing category under which non-banks could access customer accounts and all banks were obliged to provide access to customer accounts to licensed third-parties, upon due consent of the customer. Customers can directly initiate payments on their existing bank accounts from the apps of the third parties. As these third-parties do not hold customer funds, they have a much lower risk profile than e-money providers and have much simpler licensing requirements. In India, such third-parties do not need a license and can partner with a bank and offer the Unified Payments Interface (UPI)-based payment services, such as Google Pay.

2.1.3 Consumer protection

A range of emerging policy approaches aim to address consumer protection risks. Policymakers have begun adapting rules to ensure clear and timely disclosure by standardizing total-cost metrics for mobile money products and remittances, requiring pricing information to be provided before transactions are undertaken, and adapting disclosure for mobile phone screens. For example, in 2016, the Competition Authority of Kenya issued rules requiring providers to disclose all applicable charges for mobile money services before consumers complete a transaction. At the time, most providers were only providing this information after transactions were completed. Further, some regulators have required explicit warnings about product risks and responsibilities and have slowed the "one-click" process by adding intermediate steps to mitigate the risks of aggressive marketing. Product suitability rules are also being adapted to apply to DFS, particularly for digital credit. For example, some countries have required mandatory credit bureau checks, validation of credit models and validation of debt-servicing capacity. Good practices have also been established regarding provider liability for agent behavior and security of funds for e-money accounts.

Regulators world-wide are introducing new laws and regulations on data protection and privacy.[51] In the EU, the 2018 General Data Protection Regulation (GDPR) sets up a framework specifying the rights of individuals who are the subject of data – including rights on erasure, informed consent and portability, among others – and the obligations of the companies that collect, store, process and analyze it. In the United States, California has introduced similar legislation while the Congress is discussing the adoption of a privacy law at federal level. India issued a Personal Data Protection Bill in 2018 that clarified some rights and obligations of data subjects and fiduciaries. In Brazil, new legislation was approved granting data subjects a series of rights, including to data access and portability. The Asia-Pacific Economic Cooperation (APEC) is working towards the adoption of a cross-border privacy rules mechanism that provides for harmonization within the APEC economies, while also remaining compatible with EU-binding corporate rules. Finally, the European Union and the United States are working towards the refining of the Privacy Shield for its adequacy to GDPR.

2.1.4 Fostering demand for DFS and confidence amongst consumers in DFS

Policies to create demand for DFS and incentivize switching away from cash are needed alongside efforts to expand the availability of DFS. As per Findex data,[52] in developing countries, 29 percent of adults without access to transaction accounts cited "no need for having an account," although, its notable that only three percent of the same cohort cited that as the sole reason for not having an account. Studies by USAID in India[53] and other World Bank studies in Ethiopia and Pakistan indicate that this perception of "no need" is due to a combination of the fact that that their sources of income and funds are all in cash and they do not feel confident in using DFS. The former is largely linked to the level of informality in the economy. The latter could be addressed through better product design and marketing by the DFS provider. The informal economy – which operates outside legal registration and supervision – claims roughly a third of GDP and 70 percent of employment in developing countries. Informal-sector companies largely operate in cash and pay their employees in cash, as well. Globally, about 230 million adults without access to transaction accounts work in the private sector and get paid in cash, and about 78 percent of these workers have a mobile phone. In both Indonesia and the Philippines, digitizing private sector wage payments could reduce the share of adults without transaction accounts by up to 29 percentage points. In Bangladesh, research shows that garment factories cut wage-distribution costs in half by switching from cash to direct deposit to employees' transaction accounts.

Better appreciation of the benefits of using DFS and the adoption of digital financial tools can motivate and make it easier for informal firms to register and operate in the formal economy. Digital sales are easier to track than cash sales. Digital payments make it easier for businesses to pay taxes. Further,

electronic payroll technology can support formalization of labor arrangements between employers and employees. At the same time, the use of digital payment systems can help informal firms begin to establish a credit history, potentially opening the door to formal financing. Data generated from digital transactions and payments increasingly are being used to calculate credit scores, sometimes in combination with other sources of non-traditional data such as information gleaned from social media. Such data enable potential borrowers (whether individuals or firms) to begin to develop "reputation collateral," and even credit or risk scores, based on financial behaviors, such as timely payment of utility bills or consistent receipt of remittances or income, before they have received any loans from formal financial institutions. Mobile money has made it easier for entrepreneurs to access digital credit. In Kenya, 37 percent of digital credit users report borrowing for short-term business needs (working capital), making this one of the two most frequently-cited borrowing purposes. In Tanzania, roughly a third of borrowers use their loans for business needs. However, the downside of the accessibility of digital credit is the danger of drawing financially less educated customers into dangerous debt.

Governments have used subsidies and other tax inducements to encourage both businesses and consumers to adopt digital financial services and simplify requirements for firm registration. Governments have used tax incentives to encourage businesses and individuals to adopt digital payments – for example Uruguay[54] and South Korea.[55] Early research suggests the reforms have helped increase the number of digital payment transactions. Informally operating firms are encouraged to register, in order to receive these financial incentives and meet customer demands for electronic payment receipts. In the case of India, nearly 50 million micro-, small, and medium- enterprises have registered online using Aadhaar digital ID. However, the relationship between digital financial inclusion and formalization is mostly anecdotal at this stage and further research is needed to better understand how DFS can contribute to or accelerate steps toward formalization in other areas beyond registration, including tax payments and compliance with labor, health, safety, and environmental laws and regulations.

Shifting G2P payments, such as social benefit transfers, from disbursements in cash to direct deposit into transactions accounts, results in efficiency gains for the Government by plugging leak and reducing operational expenses. It can also support the growth of DFS. In 2018, the Government of India estimated fiscal gains of more than USD $12.7 billion from this process. Further, DFS enables governments to better design benefit-transfer programs – for example increasing the frequency of payments and consolidating multiple benefits. Increasingly, cash transfers are being credited directly into transaction accounts. A review of cash transfer programs in 35 WBG client countries – which included all the 25 priority countries for financial inclusion under the Universal Financial Access 2020 initiative – showed that 47 percent of the transfers are credited to accounts, 24 percent are disbursed in cash and 29 percent include a combination of both. Well-designed programs to shift social benefit transfers from cash payments to direct credit to a transaction account in the recipient's name can be a powerful enabler for financial inclusion and provide an impetus to develop the digital payments ecosystem in the country. As per Findex data, if governments digitized their payments to individuals, the number of account owners could rise by 100 million globally. Further, the share of unbanked women would be reduced—by up to 20 percentage points in the Philippines and 28 percentage points in Chile. Government authorities, together with other relevant stakeholders, can also promote establishment of the infrastructure needed for G2P payments, including logistical arrangements and the agent or correspondent network, which could also be used to deliver broader financial services.

Whereas G2P payments are seen as the primary means to promote financial inclusion, government collections or Person to Government (P2G) payments can also be leveraged for increasing usage of DFS. This could include, for example, payments for public transport, payment of bills to public utilities and payments for some Government services.

G2P digitization needs to be accompanied by efforts to enhance the financial capabilities of the recipients who are new to DFS. Policymakers designing effective financial education programs to improve financial capability for digital uptake should include four core competencies in the programs: (i) knowledge of digital financial products and services; (ii) awareness of digital financial risks (online fraud, digital footprint, overborrowing); (iii) digital financial risk control (securing PIN, account and other personal information; avoid spam, phishing, etc.); and (iv) knowledge of consumer rights and redress procedures. These programs should be made available to a broad range of audiences, through a variety of delivery channels including digital and non-digital.

2.2 Enabling financial and digital infrastructure

2.2.1 Payment Systems

Payment systems[56] promote competition in the provision of payment services and efficiency by enabling interoperability. A DFS marketplace will include several players with different institutional models (banks vs. non-bank vs. micro finance institutions). A payment system establishes common standards, rules and procedures that mitigate risks for providers and users, and promotes orderly development of the market. Critically, it should enable interoperability – the ability of a customer of one of DFS provider to make and receive payments and transfers to and from a customer of another DFS provider. Interoperability improves convenience for users, enhances efficiencies by enabling sharing of different transaction channels like ATMs, merchant POS terminals, and agents and promotes competition amongst DFS providers. In the absence of interoperability, the market either gets concentrated with a few DFS providers or leads to inefficiencies and constrains usage of digital payments.[57] In the absence of interoperability, individuals and businesses must maintain multiple accounts and decide which account to use based on the type of transaction and counterpart. For example, a business making salary payments might be forced to require all its employees to have an account with the same bank or pay them in cash or cheques. Interoperability enables the poor to effectively meet all their payment needs with one DFS provider. In the first three years of introducing mobile money interoperability in Tanzania, transactions grew 16 percent (refer to Tanzania's case in section 3).

2.2.2 Credit Infrastructure

Credit infrastructure[58] lowers the cost of lending, improves the speed of service delivery and enables responsible lending. Credit information sharing seeks to mitigate the fundamental challenge of asymmetric information between credit service providers and their customers, which applies to traditional lenders such as financial institutions, as well as the new digital players. By incorporating new alternative data from digital sources and the use of analytical tools (AI/ML) and APIs, credit reporting systems lower the cost of lending, increase speed of service delivery and quality of the information, thereby promoting the emergence and sustainable operations of new digital lending models. Secured Transaction Registries (STR) enable development of digital solutions to automate the lending cycle and collateral monitoring for asset-based lending (ABL) products[59] for MSMEs and underpin many SME lending platforms. Further, digital platforms allow for trading and taking security interests in digitized financial instruments, such as invoices, warehouse receipts, credit card receivables, and electronic payments.

2.2.3 Digital Connectivity Infrastructure

Digital infrastructure is critical for the functioning of financial infrastructure and the DFS providers. The financial infrastructure discussed in this section is dependent on more basic elements, such as a smoothly functioning ICT network with broad coverage throughout the country and a reliable power supply.

Further access to basic mobile telephony services – voice, SMS text and special system messaging service called USSD – are essential for basic DFS services (e.g., M-Pesa in Kenya and bKash in Bangladesh). Access to data services (3G and above) improves the user experience through app-based delivery of DFS services (Alipay in China and PayTM in India). App-based DFS services make detailed information on the users' digital interactions and behavioral characteristics – enabling better tailored products and credit assessments.

2.3 Ancillary Government support systems

2.3.1 Government Data Platforms

The coverage, quality and ease of accessing of government data has an impact on cost of DFS provision. DFS providers are required to conduct verification of their customers, conduct ongoing customer due diligence and validate information on their customer and their assets. These processes benefit greatly from access to information held with public authorities, Government agencies and potentially other private sector players, for example on – ID, land records, demographic information, income, tax records, education records and employment history. How DFS providers can access the data on customers held with the government has an impact on their ability to serve their customers. Availability of these data in an efficient manner using automated interfaces enable DFS providers to reduce their costs and improve customer convenience. Automated access to government data platforms has enabled banks in India to approve MSME and personal loans online in under an hour from over 20-25 days in the past.[60]

2.3.2 Digital ID

Digital ID enables regulators to simplify the Customer Due Diligence (CDD) requirements and lower the cost for DFS providers, without compromising on safety and integrity. In response to the lack of adequate documentation available to the poor, many countries have adopted a tiered approach to CDD – wherein some basic accounts, including mobile money, can be opened with a reliable official identity document or, in some cases, with a letter from a community leader. The availability of an official ID that is universal, enables meeting the CDD requirements very straightforward. The availability of a Digital ID simplifies the process further by enabling the verification to be done remotely or at an agent location and by removing the need for maintaining paper records and copies. In Bangladesh, a recent study by Bangladesh Bank[61] showed that eKYC would reduce the time to onboard a customer from four to five days to five minutes. Further, digital ID is increasingly becoming central to the effectiveness of fintech models like open banking. Open banking relies on strong customer authentication to secure customers' consent for accessing their data and accounts. Digital ID can be leveraged for developing an industry-wide common, strong customer authentication infrastructure instead of having each institution develop their own.

2.3.3 Government Financial Management Systems

Digitizing government payments requires enhancements to government financial management systems.[62] The way a government's financial planning and transaction management systems are organized, and the extent of their automation greatly impact the type of digital payment solutions that can be adopted by the government. Gaps in these systems result in perpetuation of various paper and cash-based processes, making the shift to digital payments difficult, and in some cases, constraining the range of providers that individuals can use to receive and make payments from and to the government.

3. Different approaches at the country level in EMDEs

3.1 What can we learn from different country experiences?

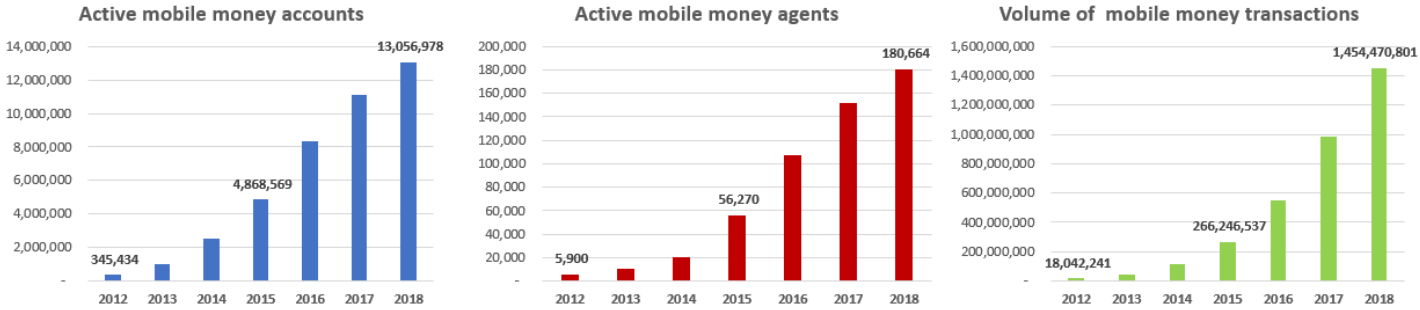
In this section, we identify several countries whose recent experiences highlight lessons that could be applied in other countries.

3.1.1 Ghana[63]

What was the major success?

Between 2014-2017, mobile money account ownership increased by nearly 200 percent with 35 percent of adults in rural areas reporting that they had used a mobile money service.[64]

Figure 5: Key Mobile Money Statistics



Source: Digital Economy for Ghana Diagnostic Report, World Bank Group 2019.

What were the key enablers of this success?

The key enabling development was that Ghana allowed non-banks – specifically mobile network operators – to issue e-money. Prior to 2015, mobile money was the exclusive domain of traditional financial institutions. Mobile network operators were just agents, whose role was limited to providing a platform for these traditional financial institutions. In 2015, new guidelines were introduced that allowed mobile network operators to set up subsidiaries that would issue e-money. These subsidiaries would, in turn, be supervised directly by the Bank of Ghana. Mobile money could now be issued not only by traditional financial institutions, but also by regulated mobile network operators. Following the adoption of the 2015 EMI guidelines, there was an explosion in provider investments in agent networks (see Figure 3 and 4). The number of active accounts and transaction volumes increased, alongside the number of active agents in the country.

The World Bank's CGAP played a role in this important development, which allowed mobile networks in Ghana to innovate, notably: MTN and Fidelity Bank's 'MTN Y'ello Save,' an interest-bearing savings product; merchant payments, and PAYGo solar payments. By 2016, PEG Africa, a PAYGo company, had onboarded 14,000 customers, made possible by ease of payments transactions facilitated by mobile money.

Since the adoption of the 2015 Guidelines, the Government of Ghana has taken further steps to foster an inclusive digital financial system through the passage of the Payment Systems and Services Act in 2019. This new act, while still awaiting signature by the President, sets the stage for further competition and innovation by formalizing the licensing process for fintechs. It would open the nation's financial

infrastructure to fintechs, which have proliferated in recent years and are driving the development of new use cases and enhanced user experiences. This represents an unprecedented opportunity to expand the adoption and use of DFS.

In addition to an enabling regulatory environment, Ghana invested in the necessary payment systems infrastructure. Ghana Interbank Payment and Settlement Systems Limited (GhIPSS), a wholly-owned subsidiary of the Bank of Ghana (BoG), provides the backbone of the country's digital payments infrastructure. GhIPSS facilitates interbank transfers, ATM networks, domestic card payments, ACH, and mobile money interoperability.

In May 2018, the Bank of Ghana took DFS growth to the next level by requiring mobile money services to be interoperable amongst themselves and with bank accounts. Following the BoG mandate, from December 2018 onward, all mobile money providers are connected to GhIPSS infrastructure, enabling full interoperability between mobile money providers and banks. This arrangement allows for the seamless movement of funds between and among mobile money, bank, and e-zwich (the domestic prepaid, payment card brand[65]) accounts. In September 2019, over one million transactions between customers of different mobile money providers were recorded, representing a growth of 250 percent over the same month in 2018.

Almost 100 percent of all government-to-person ("G2P") and government-to-government ("G2G") payments are digital. However, approximately 90 percent of government-to-business (G2B) and other government payments by volume are still made via check or cash.[66] In terms of value, 86 percent of government payments are made electronically, but person-to-government (P2G) and business-to-government (B2G) payments remain largely cash-based. In the case of B2G, 47 percent of total payments by value are made electronically, whereas just 27 percent of P2G payments are conducted electronically.

The Government is extensively using e-zwich cards for G2P payments. While multiple channels are currently available for government payments (e-zwich, mobile money, cards and direct debit/credit), most of the recent increase in digital government payments are e-zwich transactions. In order to promote the e-zwich scheme, the government encourages use of the system for payment of salaries for civil servants, payments to beneficiaries of Livelihood Empowerment Against Poverty ("LEAP"), and personnel of the National Service Scheme ("NSS"). In 2017, just six percent of adults received government payments through a mobile phone.[67] However, the adoption of e-zwich beyond government payments has been a constant challenge. At this stage most, e-zwich transfers are being immediately cashed out by recipients, meaning that government payments are not being retained in the electronic payment's ecosystem.[68]

With support from the World Bank's e-Ghana Project, Ghana has also rolled out a new Ghana E-Payment Portal (GEPP), which is designed to facilitate electronic payment for government services by citizens, businesses and other entities conducting business with the Government of Ghana. The e-Payment Portal accepts a range of payment options, including card payments, mobile money and bank transfer. Available services include payment of fixed fees, tangible goods, and services payments. Payments for taxes are also supported. However, a transaction fee is charged to customers for usage of the portal, so it is not surprising that there is low uptake of these services to date.[69]

What lessons can we extrapolate from this?

Regulation should balance the need to foster industry competition and incentivize private sector investment. The old bank-partnership model in Ghana may have disincentivized MNOs from investing in infrastructure and product innovation, without a corresponding control over operations. By creating an equal playing field for all players, non-bank entities were incentivized to invest in expanding access to DFS and given free rein over innovation and investment ownership.[70]

Sometimes government needs to invest in enabling platforms as 'public goods' to catalyze envisioned industry growth. Given the private sector's unwillingness to invest in interoperability platforms, the government of Ghana had to take the lead to invest in GhIPPS and E-Zwich to accelerate interoperability of national payment systems.

3.1.2 India

What was the major success?

India's major accomplishments in DFS are significant scale up in access to accounts and volume of transactions via digital channels, and significant scale up in digital G2P payments. In the last three years, over 300 million adults have gained access to bank accounts. In India, the share of adults with an account surged from 53 percent in 2014 to 80 percent in 2017, and the gender gap shrunk from 20 percent to six percent in the same period. On the back of the increased access, India's UPI, the country's real-time payment system which instantly transfers funds between two bank accounts using mobile apps of banks and other third-parties (e.g., Google Pay), has gone from processing 17.9 million digital transactions per month in 2016 to 1.3 billion per month in 2020.

With a comprehensive digital payments system in place, the government of India was able to leverage it to digitize G2P payments at scale. As of 2017, more than 925 banks had helped facilitate 106.75 million G2P payments, with a total value of over Rs. 44.14 billion being electronically deposited in the recipient's bank accounts, instead of being paid out in cash. The recipient can use debit cards and mobile apps linked to these accounts to receive and make payments. Each account is linked with a unique ID (Aadhaar), which enables detection of duplicates. Based on 2017 estimates from the Ministry of Communications and Information Technology, this direct transfer to accounts resulted in USD $7 billion dollars in savings over two-and-a-half years. This is largely due to savings from eliminating/reducing leakages caused by double-dipping and payouts to ineligible recipients.[71] In addition, digitizing G2P payments to women beneficiaries not only brought lower costs, higher security, and greater transparency to G2P payments, but also helped empower women.[72]

Key enablers of India's DFS expansion

In 2014, India embarked on one of the most ambitious digital financial inclusion initiatives seen in any country, which was made possible by investments in key enablers. Two critical enablers were the technological infrastructure and systems supporting innovation and well-calibrated regulations reflecting the government's prioritization of financial inclusion. India's DFS development has been a technology-led and bank-based model, which prioritized creating the enabling infrastructure and ancillary systems – including digital identification and payments.

(1) The Biometric ID Program gave the ability to cheaply, reliably and digitally verify and authenticate ID

India's government-led biometric identity program, Aadhaar, established in 2009, helped broaden the reach of DFS. As noted above, access to traditional financial services typically requires extensive documentation for authentication, inhibiting the poor from participating in the financial system, as many people lack proper identification. In India, Aadhaar provides a simple identification method which is permitted to be used to comply with KYC requirements prior to opening a bank account. Further, Aadhaar enabled opening accounts instantly, as the verification and authentication were digital and could be conducted at agent locations. This reduced the cost of KYC from Rs. 1500 to around Rs. 20 (see section 1).

(2) The India Stack connected different components of digital infrastructure.

The "India Stack" – a government-led digital infrastructure, based on a set of APIs (Application Programming Interface) – has served as a foundation for the growth of the digital ecosystem, enabling presence-less, paperless and cashless digital payments. Five basic layers make the stack work: the biometric identity database, a virtual payment simplified address (which allows transactions to others via phone numbers and other aliases), digital payments interoperability, a "digital locker" to securely save copies of documents to share with service providers, and an e-consent system. Taken individually, none of these layers are unique to India and can be found in several countries. What is special about India Stack is that all these pieces of digital infrastructure are connected to each other and can work in tandem to simplify the user experience.

(3) The electronic payment system is robust.

a) Interoperability across multiple transaction channels and open standards

India's electronic payment system allows individuals the choice of the channel and mobile app provider, irrespective of with which bank they maintain their account.[73] In India, individuals and businesses are able to transact using multiple channels, such as internet, mobile and cards, and can make and receive payments from any bank account in the country. UPI goes a step further and simplifies the payment process through the use of aliases, QR codes and choice of apps. To ensure interoperability using simple feature phones (not smartphones), the National Unified USSD Platform (NUUP) was set up by NPCI to offer USSD-based mobile payments services. More recently, NPCI launched the UPI service for non-internet based mobile devices. The Unified Payments Interface (UPI), launched in 2016 by the National Payments Corporation of India (NPCI), allows instant, around-the-clock payments between accounts. NPCI is owned by a consortium of India's commercial banks, though the Reserve Bank of India helped designs and encouraged the formation of this institution.

This payment system has a number of unique features: (i) it allows individuals and businesses to setup aliases which becomes their "payment address," doing away with the need to communicate multiple pieces of information to their payers;[74] (ii) merchants need only one QR code to receive payments for different payment schemes in India (including Visa and MasterCard); and (iii) customer can choose any mobile app that offers UPI services and is not limited to the mobile app provided by his/her bank. Many new payment systems have one or two of the above, but not all three – for example Mexico's CODI system and Thailand's Promptpay do not have the third feature and China has feature (ii) but not the others. A notable comparison is with the payment system in China – where QR codes are used extensively, but a merchant must use a separate QR code for each payment service provider (one for AliPay, one for WeChat Pay and so on). This lack of interoperability, combined with the market power of the AliPay and WeChat Pay, has made China a very concentrated payments market.

b) Sound legal and regulatory framework that enabled orderly and rapid development

The enactment of the Payment and Settlement Systems (PSS) Act, 2007 and other prior regulatory measures provided a sound legal basis for the development of payment and settlement systems. The 2007 act established the RBI as the regulator and overseer of the entire national payment system and all financial institutions offering payment services. Further, the law enabled the RBI to allow non-bank entities to offer e-money accounts and allowed the setup of institutions like NPCI, which could establish their own rules and procedures. This facilitated the introduction of UPI. Very early, the RBI established measures for consumer protection by establishing a Banking

Ombudsman (BO) scheme as an alternate dispute redressal mechanism for resolution of disputes between banks and their customers; and by setting up a body to develop industry code of standards – Banking Codes and Standards Board of India (BCSBI), for promoting adherence to self-imposed codes by banks for providing effective and efficient customer service. Given the rise in digital payment transactions and the entry of non-bank payment service providers and operators, the RBI has recently established the Ombudsman scheme for digital transactions (OSDT) which provides a free and expeditious complaint redressal mechanism for customers relating to their digital transactions conducted through licensed non-bank payment service providers.[75] Further, the RBI took measures for limiting customer liability in respect of unauthorized electronic transactions.[76]

What lessons can we extrapolate from this?

India's experience of a technology-led approach to DFS development highlights the value of having the public-sector lead by example. In the case of India, the Government's commitment to financial inclusion, along with their vision to provide the necessary infrastructure and systems for innovation and digitization of G2P payments have been critical to the fast development of digital payments. Accompanying these systems with proper regulations that level the playing field, ensure interoperability and allow for effective regulation and supervision as India has done is also key.

India's experience shows that in some contexts, a bank-led approach could work and shows the possibility of allowing non-banks to enter the market through differentiated banking licenses. The growth in financial inclusion in India has been entirely led by banks. Though non-banks can offer e-money, it was never targeted at the unbanked. Money deposited into e-money accounts cannot be withdrawn in cash at agents or at ATMs. They can only be used for making payments. This was clearly not suited for the needs of the unbanked; however, it was useful for some banked customers for bill payments, ecommerce and other such specific payment needs. Subsequently, to allow non-bank entities to offer DFS, regulators created a specialized-license for a limited-purpose bank specialized in small savings and payments services (called payment banks) which is subject to lower prudential requirements. The capital requirements to become a payment bank are considerably higher than those in other countries where non-bank licenses to offer e-money exist (e.g., Ghana, Kenya, and Tanzania). Many mobile network operators and fFintechs who were offering e-money services took a payment bank license. It is too early to say if payment banks in India will be able to scale up and grow the market. The early signs are not very positive. However, as noted before, third-party service providers can offer payment services by leveraging the UPI interface.

While account ownership has markedly increased, low usage remains a challenge with only 54 percent of accountholders transacting in the past three months. The country is trying to tackle this challenge with a renewed focus on DFS.[77]

The fast pace of technological development in DFS in India has caused some in India to raise personal privacy concerns. Aadhaar's design and security has been criticized in India on privacy and security grounds, particularly given the size of the biometric database.

3.1.3 Kenya

What was the major success?

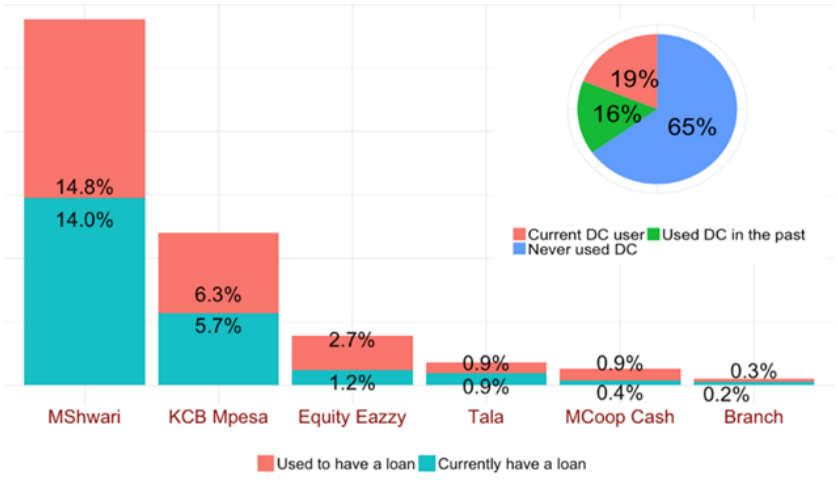
Kenya has the largest and most successful mobile money sector in Africa and has consistently led the continent both in scale and innovation. M-Pesa was first introduced in 2007 by MNO, Safaricom – which had a dominant telecom market share of 79 percent.[78] It has become a ubiquitous way to transfer money

among individuals, driving formal financial inclusion to over 80 percent of the population in 2019 – the highest in in Africa. By December 2019, there were 58.3 million mobile wallets, representing 1.7 mobile wallets for every adult. A recent study has shown that mobile money has actively lifted two percent of Kenyan households out of poverty, driven by changes in financial resilience and savings, a shift from farming towards business, and a significantly positive effect on women.[79]

M-Pesa's basic P2P payment solution was a foundational building block for the development of a wider and more diversified DFS ecosystem. M-Pesa's initial advertising slogan *"send money home"* pointed to the core function it offered to the lower income population: facilitating internal remittances, mostly from urban to rural areas. This was backed by an extensive agent network that enabled M-Pesa customers to convert their cash to e-money and back, as and when needed. Over time M-Pesa developed a variety of P2P and P2B payments, covering many use-cases from small informal sector payments and contributions to the informal savings groups, to utility bills as well as payments at gas stations, supermarkets and hospitals.

M-Pesa has partnered with the banking sector and now channels services such as credit, savings and overdraft-like facilities. Over the years, Safaricom built partnerships with a variety of commercial banks to provide additional services beyond its flagship P2P and merchant payments. One of the most important developments occurred in 2012, when Safaricom partnered with the Commercial Bank of Africa (CBA) and started offering M-Shwari – a mobile operated bank account which gives access to interest-earning savings account and a fully automated digital credit product. In 2016, Safaricom partnered with the Kenya Commercial Bank (KCB) to provide a similar digital credit product on its platform (KCB M-Pesa). In 2019, it launched "Fuliza," an overdraft facility which allows M-Pesa customers to complete merchant transactions, even if the available balance in the mobile wallet is insufficient. A variety of similar products were introduced in the market after 2016, such as Equity Bank "Eazzy Loan" and Fintech digital credit products such as Branch and Tala. A CGAP/FSD Kenya study conducted in 2018 estimated that one in three mobile owners in Kenya borrows from their phone.[80]

Figure 6: Percentage of mobile owners in Kenya using digital credit in 2019*



Key enablers of Kenya's DFS expansion

1) **Private-sector led model (both in terms of mobile operator, Safarisom, that launched in M-Pesa, and reliance on agent networks).**

M-Pesa rose because of significant private investments, strong execution and a dominating share of the telecom market. Safaricom is Kenya's dominant MNO, with over 80 percent market share at the time it launched M-Pesa. It invested heavily on building a vast agent network, which covered rural and urban areas. M-Pesa uses a large number of small retail agents (approximately 225,000 in December 2019), many of whom are existing grocery or retail stores, to allow cash to be deposited or withdrawn through a simple SIM based application. Although Safaricom launched an M-Pesa smartphone app in 2018, most transactions are still conducted through the basic Sim-Toolkit (STK) which does not require a smartphone or even an internet connection. Since M-Pesa was introduced, the number of mobile money users and agents increased dramatically. In 2019, it generated USD $750 million in revenues for Safaricom and it is used by 79 percent of Kenya's adult population.[81] In a context where bank branches and the ATM infrastructure were scarce, M-Pesa created a much cheaper, safer and more efficient way of sending and receiving money over distance.

2) **Regulatory flexibility**

The "test-and-learn" approach taken by the regulator was also instrumental to the success of M-Pesa. The existing regulatory framework in 2007 did not provide the legal basis to regulate products offered by non-banks. CBK management conducted a legal and operational assessment of M-Pesa's business model and reached the decision to issue a "letter of no objection." The assessment concluded that M-Pesa did not provide banking services, primarily because it did not accept customer deposits,[82] it did not perform financial intermediation, and it did not provide interest on savings.[83] The assessment also concluded that M-Pesa did not pose a threat to financial stability. The CBK required that M-Pesa's e-float balance had to be stored in a trust account in a local bank and had to be reconciled daily. Any withdrawals from the trust account had to be authorized.[84] This may have made sense at the time, because this was so innovative and may not necessarily be applicable to other countries. Subsequent experience in Kenya shows that while this approach enabled rapid expansion of mobile money, a comprehensive regulatory framework had to be established to respond to concerns over competition and consumer protection.

3) **Simplified Customer Due Diligence**

The adoption of simplified CDD was critical for the development of mobile-based bank accounts. Credit and savings products provided on the M-Pesa platform such as M-Shwari and KCB M-Pesa use a simplified CDD procedure, which allows virtual and remote account opening without any additional documentation requirements. The banks simply access the information that customers provided to Safaricom at registration stage (for example, national ID or passport). This information is then verified against the Integrated Population Registration System (IPRS), an official database maintained by the Kenyan Government. Customers can deposit up to a maximum of approximately USD $2,500 in their M-Shwari bank account, but they are subject to additional verifications when they exceed that amount. The simplified CDD has been an enabler in many different contexts and can be considered a general enabler.

What lessons can we extrapolate from this?

Kenya's success story in DFS shows that risk-based regulatory approaches can foster innovation and promote financial inclusion. Instead of taking a conservative approach and denying Safaricom the ability to operate due an absence of regulation, the CBK adopted a "test and learn" approach, which enabled Safaricom to operate in the market and helped the CBK to monitor its developments more efficiently. This

created the basis for proactive dialogue between the regulators and the DFS providers, allowing for closer monitoring of new and hybrid business models which are not covered by existing regulatory frameworks.

Although the flexible regulatory approach has allowed mobile money and digital credit to thrive, consumer protection concerns have been raised. The success of digital credit products such as M-Shwari and KCB M-Pesa has attracted many new and often unregulated Fintech players in the market. As a result, consumers can borrow from multiple providers and default rates have surged in recent years, especially among first-time borrowers. Research by MicroSave shows that 2.2 million digital credit borrowers in 2018 had non-performing loans listed in the credit bureaus – almost 10 percent of the adult population – half of which have outstanding balances of less than USD $10.[85] Research by FSD Kenya showed that in 2019, there were over a hundred digital credit providers listed in the app store, many of which did not follow key data privacy and consumer protection principles. Regulatory frameworks for market conduct and consumer protection among non-bank Fintech providers remains an important area to be further addressed.

The Competition Authority of Kenya (CAK) has taken action to promote greater competition in the market and lower fees for customers. The CAK took three key actions to promote competition in the mobile money market. First, it required transparency in the pricing of USSD services – which are essential for provision of mobile money services to place banks and telecom companies on the same footing. Second, the CAK banned exclusivity contracts for mobile money agents enabling an agent to provide services to multiple mobile money providers. Lastly, CAK in collaboration with other authorities required interoperability for mobile money services. Despite, competition emerging in recent years, M-Pesa is still by far the largest mobile money provider in Kenya. The emerging competition has however led to drop in price of mobile money services.

3.1.4 Tanzania

What was the major success?

Tanzania has experienced explosive growth in the use of mobile money, since the service was first introduced in 2008, and has managed to do so under a highly competitive and collaborative market. From only 112,000 in 2008, the number of registered mobile money users has grown to over 95.1 million in 2019. A total of 23.9 million active users had conducted at least one transaction in the past month. Competition between MNOs has reduced the cost of money transfers and has led to annual, double-digit growth in the market size. The mobile financial services market in Tanzania is unique in that the four major players actively compete for customers, while also sharing the agent network (with over 560 thousand agents as of 2019). This has clear benefits for consumers, in terms of both the number of access points—in 2017, 78 percent of Tanzanians in rural areas live within 5 km of an access point—and service costs. In 2015, service costs were USD $0.17 for transferring an amount of USD $20, compared to USD $0.37 in Kenya).

As mobile money use increased in Tanzania, innovations that serve the poor have also flourished. Banks realized that there were opportunities to partner with mobile money providers to reach greater numbers of customers at a lower cost. This has led to several innovations that have had an important impact on financial inclusion, including: Vodacom and CBA's digital savings and credit product M-Pawa; Jumo and Airtel's Timiza digital credit product; and FINCA Microfinance Bank and Halotel's digital savings HaloYako. In 2017, 35 percent of Tanzanians who saved in the preceding year, did so on a mobile wallet, a share above the 16 percent who saved in banks, but still lower than the 43 percent who kept savings at home. There was also a rise of pay-as-you-go solar companies using mobile money to pay for inexpensive off-grid energy.

Key enablers of Tanzania's DFS expansion

The fast growing and competitive development of the digital financial services (DFS) market in Tanzania had two main enablers: Bank of Tanzania's facilitating role in carefully balancing the need to ensure adequate supervision while avoiding stifling the market; and the industry-led interoperability arrangements. The presence of a thriving and highly competitive mobile telecommunications sector and significant early investments in customer awareness and agent networks also contributed to successful development of DFS in the country.

Regulatory flexibility: Bank of Tanzania adapted to market evolution

To foster innovation, Bank of Tanzania (BoT) pursued a test-and-learn approach similar to that of Kenya. At first, when innovators were trying to enter the electronic payments space, BoT responded by issuing the 2007 Electronic Payment Scheme Guidelines. However, these only applied to banks and similar financial institutions. To enable the entrance of non-banks, the BoT allowed MNOs to launch their own payment services through the issuance of letters of no objection. With this instrument, BoT allowed non-bank providers to legally offer their service under their oversight. Just three years later, the mobile money market had four strong market competitors M-Pesa (Vodacom), Airtel Money (Bharti Airtel), Tigo Pesa (Tigo) and Z-Pesa (Zantel). Only after witnessing this boom in market entrance and DFS take-up did the BoT strengthen the regulatory framework through the enactment of the National Payments Systems Act in 2015 and the Electronic Money Issuer Guidelines. While the letters of no objection had given providers the confidence and space to invest and innovate, the NPS Act improved transparency and the homogeneity of the system by issuing mobile financial service provider licenses, establishing clear requirements and procedures applicable to all of them and imposing penalties for non-compliance.

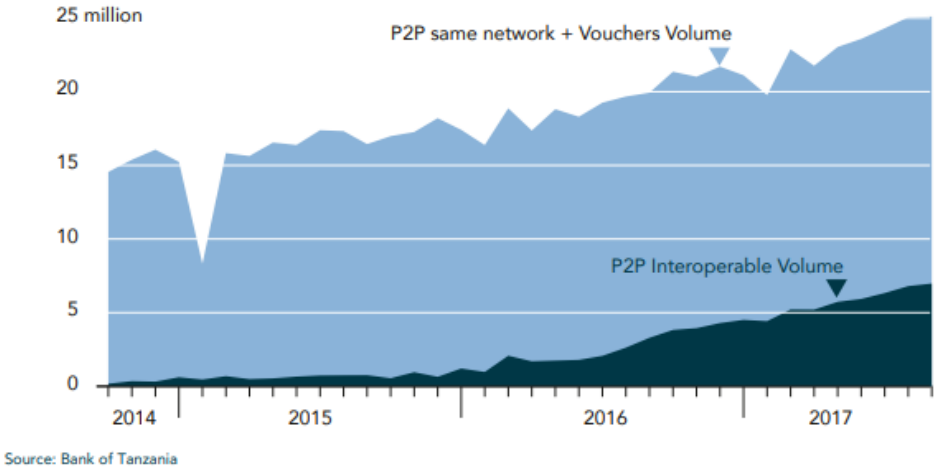
Tanzania's regulatory framework that resulted from the test-and-learn approach also introduced critical measures to foster competition. This has three key elements.[86] First, a specialized licensing window for nonbank providers to issue prepaid accounts, without being subject to the full range of prudential rules applicable to banks and without being permitted to intermediate funds. Second, mobile money providers are permitted to use third-party agents to deliver financial services. Third, simplified CDD provided the possibility to require less documentation to open certain types of accounts.

1) **Industry-led interoperability framework**

   Interoperability of mobile money services was an industry-led effort in an enabling regulatory environment. The EMI Guidelines stipulated that payment services had to be able to provide interoperable services with other mobile payments services providers. This provided the framework to first create the set of governance and operating rules that would govern mobile money interoperability which was achieved through frequent negotiations across the industry players and were facilitated by IFC and funded by the BMGF.

   By 2014, the providers had agreed on participation criteria, clearing and settlement principles, and approaches to dispute resolution. Once the standards were in place, providers agreed to connect and negotiate pricing bilaterally, unlike in Kenya, for example, where interoperability was mandated in 2018 and early evidence shows very few interoperable transactions have been made. Interoperable transactions went from only 174,000 in 2014 to over 6.9 million by 2017, representing about 28 percent of all P2P transactions. By 2017, 60 percent of Tanzanian mobile money users reported having made an interoperable P2P transaction in the past 6 months. As noted below, however, having an industry-led interoperability framework using bilateral agreements may have its own risks.

Figure 7: Volume of P2P and Interoperable P2P Transactions



Source: Bank of Tanzania

What lessons can we extrapolate from this?

Tanzania's approach to DFS market development demonstrates that competing DFS providers can work together to develop the market without the need for a mandate from the Central Bank. Allowing the industry to lead the process of negotiating interoperability standards and rules ensured their critical buy-in from the outset. This industry-led interoperability scheme was a key catalyst forr the successful mobile money uptake in Tanzania in the short-term.

However, this interoperability approach of bilateral agreements still has some limitations and the BoT is currently working on establishing a centralized payment system with a multilateral scheme. New entrants face the challenge of setting up their own bilateral agreements with all the other providers. The BoT also has limited visibility into the interoperability arrangements and are unable to adequately monitor risks, in contrast with the oversight potential of a centralized infrastructure and multilateral agreements. Further, the current interoperability framework only works for mobile money-to-mobile money transactions and does not allow interoperability between bank accounts and mobile money accounts. Finally, all mobile money operators are required to maintain accounts with all other operators and keep adequate balances. This places higher demands on liquidity in the system and may not be sustainable as volumes grow. The BOT is currently establishing a centralized system with a multilateral scheme covering transactions amongst mobile money accounts and bank accounts. In the proposed system, mobile money providers and banks would need to maintain only one settlement account. New mobile money providers and other licensed institutions will not need to bilaterally negotiate pricing and settlement arrangements with other providers, instead they will directly join the multilateral scheme.

Consumer protection remains an important area for further regulatory consideration. Over-indebtedness has become a concern with the expansion of digital credit in Tanzania, where 21 percent of mobile phone owners have taken out a digital loan. Defaults and late payments are persistently high in Tanzania, with 31 percent of borrowers having defaulted (three times higher than Kenya) and 56 percent having repaid a digital loan late.[87] Lack of transparency could be playing a big role, as almost a third of digital borrowers have experienced unexpected fees, unexpected withdrawals by the lender or have stated not understanding the costs and terms of the loan.

3.2 What can the private sector do to leverage Digital Financial Services and what is happening in the market?

3.2.1 India

There were an estimated 1,500 fintechs in India by 2017.[88] Application of technology to the challenge of inclusion in India is not new. For example, one of the earliest Indian fintechs, Financial Innovation and Network Operations ("FINO") was formed in 2017 as a service provider offering end-to-end IT and service solutions to financial institutions to enable them to reach out to unbanked geographies. IFC was an early equity investor. FINO provided a core banking and payments system, using smart cards and POS terminals to enable low-cost, reliable financial transactions for banks' remote customers. FINO went on to offer business correspondent (agent) solutions to banks, microfinance institutions, insurance companies and government agencies serving rural areas of India. By 2015, FINO served as a 'banker to the last mile' for 40 financial institutions, operating an agent network of 30,000 (a third women), reaching 85 million customers. In 2017, FINO launched a payments bank under the new RBI regulation. IFC's FIG Advisory Services worked with FINO on the business plan and strategy submitted to RBI. FINO payments bank has 265 branches and over 170,000 service points providing deposits, savings, loans, and insurance services (through partners), as well as over one million monthly remittances, cost-effectively delivered to rural recipients.

More recently, fintech startups have proliferated in India, building on the India Stack, as well as locally strong technology and finance skills, easily available venture funding, and an environment ripe for disruption, due to lack of access to finance and slow and cumbersome traditional financial service providers. Some of these companies have scaled at a very fast pace, and now dominate their respective categories. Prominent applications include mobile wallets, alternative lending, and insurance.

Mobile wallets have proliferated, and a few have acquired meaningful scale and usage. PayTM has >200M users of its mobile wallet, allowing customers to make payments from/to any account at no fee, and enabling over eight million merchants to accept electronic payments. PayTM attracted investments from Softbank and Ant Financial, and in 2017, was granted permission by RBI to launch a payments bank. Google launched its a payments app in 2017, building on UPI to enable account-to-account transfers with a simple interface; by 2019, it had 67 million monthly active users and annual transactions of USD $110 billion. WhatsApp, used by 250M Indians, has a payments app in beta test and is hoping to obtain regulatory approval for full launch this year. Walmart PhonePe and Amazon Pay also use UPI for their payment apps. Through these and other apps, UPI surpassed 100 million users in less than 4 years.[89]

Alternate lending has taken-off in India with fintech startups facilitating P2P, consumer & SME loans. Prominent names include Mintifi (an IFC investee), Capitalfloat, Faircent, Lendingkart, Moneytap, and Power2SME. These companies leverage Aadhar, UPI and other elements of the India Stack to streamline processes from onboarding to credit decision, disbursement, and collection. They deploy big data and analytics to cover clients that may not have traditional credit history, and to make rapid credit decisions. Disbursal can be done within hours of application, compared to weeks for a bank.

Various business models leverage different regulatory structures. Some of the online lenders employ a marketplace model, in which they originate loans that are ultimately extended by bank partners. Others have been licensed as NBFIs and deploy their own capital, sometimes alongside banks. The P2P market was only officially sanctioned with RBI's launch in 2017 of a specific NBFI-P2P regulation. Platforms licensed for P2P can connect individual borrowers with lenders, but cannot disburse from their own books and are expected to restrict the exposure of individual lenders and borrowers to this asset class. Again, the

onboarding is facilitated by the India Stack and disbursement from the lender's bank account to the borrower's by UPI.

Online insurance marketplaces such as Policy Bazaar, Coverfox, and Turtlement, have simplified and digitized the process of purchasing an insurance policy and help customer make informed decisions. These are regulated under IRDA as agents or brokers depending on the business model.

3.2.2 Bangladesh – bKash

Bangladesh's regulatory changes in 2011 allowed banks to establish regulated subsidiaries offering mobile banking services. The country's mobile network operators (MNOs) were also encouraged by the Central Bank and telecommunications regulator to provide mobile banking providers with access to their networks. Combined, these measures laid the groundwork for financial institutions to reach customers in partnership with MNOs, who had by 2012 reached 65 percent penetration. BRAC Bank established mobile banking operations bKash in 2011.

In 2013, IFC took a 12.5 percent stake in bKash with a $10 million equity investment and supported its growth to become the largest mobile financial services provider in Bangladesh. bKash is the second largest globally, with 30 million registered users and a network of about 220,000 agents throughout the country in 2019. bKash agents can be airtime providers, kiosks, or grocery store owners, and they perform a critical role for bKash. They provide "cash-in and cash-out" services that allow customers to effectively withdraw cash and deposit cash into their accounts. They also provide step-by-step guidance on how to make transactions. Cash in and cash out can also be done at BRAC Bank ATMs. bKash made early strategic decisions to target low-income customers with a user interface that can be used on basic "feature" phones.

bKash processes around 5.5 million transactions per day and has made a significant contribution to financial access in Bangladesh, which progressed from account penetration of 31.7 percent in 2011 to 50 percent in 2017. bKash has a fee structure designed to encourage use, with no fee for cash in and transfers from bank accounts and low fees for sending money. bKash significantly increased convenience and security and reduced the cost of sending money from urban to rural areas and other person-to-person transfers. By 2017, 30 percent of adults in Bangladesh had made a digital payment, up from six percent in 2014.

Over the years, IFC has catalyzed additional financing and provided advisory support, particularly in helping increase merchant usage of the bKash platform. bKash added mobile merchant payments to its service offerings in 2014. IFC's FIG Advisory Services provided support for developing a strategy for the product and for acquiring new merchants. To date, bKash's platform comprises more than 50,000 merchant establishments throughout Bangladesh. Merchant payments are free to the consumer and enable small enterprises to participate in a payment network, with microenterprises paying no fee up to BDT 15,000, and one percent for larger volumes.

3.2.3 Kenya – Leveraging the broad use of mobile money

The broad adoption of mobile money in Kenya has created the funds transfer infrastructure necessary to offer a range of financial and non-financial services. These range from pay-as-you-go solar panels that are purchased on an installment plan and repaid via M-Pesa transfers, to micro-insurance, and general-purpose loans. Kenya has one of the most developed Fintech markets in Africa, with scores of startups, several accelerators, and a growing local investor base. Nine of the 2019 Inclusive Fintech 50 winners are from or conduct business in Kenya.

One of the most significant impacts in the Kenyan market has been wide-scale acceptance of M-PESA for retail (merchant) payments. In most markets, including Kenya, most financial transactions occur in shops, but shopkeepers can be hesitant to accept digital payments due to merchant fees, tax, and administration considerations. In Kenya, over 70,000 merchants accept M-Pesa payments and nearly a million customers use the service every day; acceptance of 'Lipa na M-PESA' is now near-ubiquitous. Merchant acceptance has largely been driven by consumer demand, but many shop owners were also attracted by the offer of low-cost loans based on their trackable mobile money revenues.[90]

In 2017, Kenya became the first country to launch a mobile-only retail bond, M-Akiba, allowing micro-investments in government securities with investments as low as $30. The product was offered by the government of Kenya though the Central Bank of Kenya (CBK) under the National Treasury in collaboration with Nairobi Securities Exchange (NSE), Central Depository Settlement Corporation (CDSC), Mobile Network Operators, and Kenya Association of Stock Brokers & Investment Banks (KASIB). Mobile money users can sign up using their registered SIM and national ID, and fund their investments using M-Pesa. The Government raised a total of 150 million in the "Special Limited Offer" which was issued on March 23, 2017 with a closure date of April 7 but was sold out and closed two days earlier (April 5, 2017).

Branch International is a mobile app digital lender. Since 2015, it has provided more than 15 million loans to over three million customers, disbursing a total of USD $350 million via M-Pesa. In March 2018, IFC made and equity investment in Branch and has supported its further growth with additional equity and debt. Branch is now also operating in Nigeria, Tanzania, Mexico, and India. A potential borrower downloads the Branch app, verifies his or her identity, and provides consent for Branch to access the customer's smartphone data. The system creates personalized loan options in a matter of seconds, allowing Branch to approve a loan within minutes. Loan durations range from a few weeks to more than a year, with a typical loan amount of around USD$50. Eighty-five percent of borrowers use these loans to start or grow a business, or fund education. Loans are disbursed and repaid using M-Pesa. Underwriting and servicing loans of this size and pace would not be viable at scale, using traditional manual credit assessment methods and cash handing processes.

FarmDrive is a Kenyan agricultural data-analytics company delivering financial services to unbanked and underserved smallholder farmers, while helping financial institutions cost-effectively increase their agricultural loan portfolios. Using simple mobile phone technology, alternative credit scoring, and machine learning, FarmDrive closes the data gap that prevents smallholder farmers from getting the financial services that would allow them to grow their agribusinesses and increase their incomes. A combination of risk management tools and efficient processes enables financial institutions to sustainably reach a market that would otherwise not be cost-effective to service. FarmDrive piloted in 2015-2016 and was part of the Fincluders Bootcamp 2017. The company expected to scale to USD$13 million of loan originations in 2019 and reach up to USD $3 million smallholder farmers over the next 5 years.[91]

Mobile money is also improving access to healthcare. Safaricom's M-Tiba enables over 800,000 Kenyans to save and access treatment at more than 400 facilities. By 2017, M-Tiba had paid out more than KSHs.126.8 million to customers spread out over 83,000 clinic visits.[92]

3.2.4 Tanzania

The DFS market in Tanzania, with its more competitive market structure, has grown to rival neighboring Kenya. In just one year after the introduction of interoperability in 2014, awareness of mobile money among the 79 percent of Tanzanians with access to mobile phones was 95 percent, and 63 percent of adults had used mobile money. The services on offer are increasingly sophisticated and uptake is good. By 2015, almost half the users were engaged in P2P transfers for both personal and business transactions,

and 32 percent were undertaking advanced activities, such as remunerated savings and loans. In 2014, Tigo started paying quarterly bonuses to customers, based on the balances held in their Tigo Pesa wallets. The central bank now requires all mobile money services to provide a profit share from the trust account holdings.

The agent aggregator market is strong in Tanzania, with several large, aggressively expanding agent networks servicing both banks and MNOs. The aggregator model lowers the cost of opening agents, as multiple providers can be serviced at a single agent. Three major aggregators – Selcom, Maxcom, and Cellulant – also offer their own value-added over-the-counter services. Customers can pay bills and send remittances via the agents, without needing to use a mobile phone.[93]

Savings, lending, insurance and other services have been layered on top of Tanzania's mobile money foundation. For example, in 2014 Vodacom launched M-Pawa in partnership with the Commercial Bank of Africa to offer savings and loans; by 2017 the service had over 5 million customers and issued around 350,000 micro-loans per month. In 2017, FINCA Microfinance Bank Tanzania partnered with MNO Halotel to offer HaloYako, a mobile a mobile savings product offering a free account and airtime bonuses when savings targets are met. ACRE Africa, one of the 2019 Inclusive Fintech 50, offers its crop, livestock, and index insurance products to smallholder farmers in Tanzania as well as Kenya and Rwanda. Mobile money also provides the foundation for non-financial business models such as pay-as-you go solar, which has grown rapidly in Tanzania.

3.2.5 Thailand -- PromptPay and Common QR

PromptPay is a fast payments service with real-time clearing and settlement combined with a proxy look-up service that securely maps a national ID number, corporate tax ID, or phone number to a bank account. This enables users to 'push' a payment from their account to another account at any of the participating 23 banks. PromptPay is a product of the National Interbank Transaction Management and Exchange Company, the common ATM switch in Thailand, and technology provider VocaLink (now a MasterCard subsidiary). PromptPay launched in January 2017 and by mid-2019 had 49 million (70 percent of the population) registered as users, and was processing over 4 million transactions per day. [94] Banks charge no fees for PromptPay payments under TBH 5000. The average transaction size is THB 3000. Most of these represent cash transactions shifting to digital rather than a shift from card or electronic funds transfer. Digital payments rose 83 percent from 2016 to 2018, while fund transfers via bank branches declined 30 percent in 2018, and ATM use declined 34 percent.[95] A key contribution to this transition has been the ability to pay merchants quickly and securely with an interoperable QR code system.

The standardized PromptPay QR code was one of the first innovations to take advantage of the Bank of Thailand's regulatory sandbox. In many countries, QR systems are proprietary and a customer would have to be using the same provider as the merchant in order to pay (in practice many merchants sign on to multiple systems to be able to serve more customers and must manage funds across those separate accounts). Bank of Thailand guided the industry towards an interoperable common solution built on open infrastructure. Industry collaborated to establish standards and business rules. Eleven banks jointly tested the technology, customer service, and security aspects of a common QR system in the Bank of Thailand sandbox from August to December 2017. The QR system was rapidly adopted by merchants. By mid-2019, more than 3.7 million merchants were accepting PromptPay QR payments, compared to 140,000 merchants accepting cards with 480,000 traditional POS devices. PromptPay and merchant QR payments have contributed significantly to the growth in digital payments in Thailand, reduced costs for making and accepting digital payments, increased security and convenience for customers, and improved operations and transparency for merchants. Cross-border QR is now available in several ASEAN countries where Thai banks have partnered with foreign banks—for example Krungsri with MUFG in Japan—to enable Thai customers to use their Thai QR system in foreign shops.[96] Bank of Thailand and National Bank of Cambodia

entered into an MOU in 2019 to create an interoperable Cambodian-Thai QR system, which three Cambodian banks were set to implement.[97]

Annex 1: Data Sources and Gaps

Existing relevant databases

- Global Payment Systems Survey (GPSS) – The WBG has been conducting the biennial Global Payment Systems Survey (GPSS) with central banks since 2007. The survey provides important data on the use of cashless transactions, as well as improvements in the critical payments infrastructure and legal/regulatory frameworks, providing a mechanism to monitor the enabling framework for DFS. Latest iteration of the survey is currently in progress.

- Global Financial Inclusion and Consumer Protection (FICP) Survey – The Global FICP is a survey of financial sector regulators. The survey provides a valuable source of global data for benchmarking advancements in key issues related to the enabling environment for financial inclusion and consumer protection. These include issues on National Financial Inclusion Strategies (NFIS), regulation and supervision of providers relevant to financial inclusion, risk-based anti-money laundering and combatting financing of terrorism (AML/CFT), institutional and supervisory arrangements for financial consumer protection, disclosure and transparency, and dispute resolution. The Global FICP Survey complements the GPSS for monitoring the enabling environment for DFS.

- Remittance Prices Worldwide (RPW) – RPW monitors remittance prices across all geographic regions of the world. Launched in September 2008, RPW monitors the cost incurred by remitters when sending money along major remittance corridors. RPW is used as a reference for measuring progress towards global cost reduction objectives, including SDG 10.c and the G20 commitment to reduce the global average to 5 percent, which is being pursued in partnership with governments, service providers, and other stakeholders. RPW covers 48 remittance sending countries and 105 receiving countries, for a total of 367 country corridors worldwide. Data are collected quarterly by a mystery shopping exercise.

- Global Findex – The Global Findex database is the world's most comprehensive data set on how adults save, borrow, make payments, and manage risk, published every three years. The data are collected through nationally representative surveys of more than 150,000 adults in over 140 economies. The database includes indicators on access to and use of formal and informal financial services.

- Doing Business – The Doing Business project provides objective measures of business regulations and their enforcement across 190 economies and selected cities at the subnational and regional level. Doing Business gathers and analyzes comprehensive quantitative data to compare business regulation environments across economies and over time, encourages more efficient regulation and offers measurable benchmarks for reform.

- Cambridge Centre for Alternative Finance – the CCAF surveys alternative finance providers globally, including in EMDEs. They cover debt, equity, and rewards crowdfunding and marketplace platforms. However, the sample does not capture new providers not yet known to CCAF, the provision of contextual finance by other e-commerce platforms, or alternative lending models being adopted by traditional institutions. The dataset reflects only voluntary responses received from those surveyed by CCAF, not uniformly collected regulatory/supervisory data.

Annex 2: Glossary

Agent Banking (also, branchless banking or correspondent banking): Third-party business arrangements of banks and non-bank payment service providers that are typically local entities, such as small shops, to provide basic payment and transaction account-related services on their behalf.

Application Programming Interfaces (APIs): An Application Programming Interface (API) allows software programs to interact by exchanging data which can prompt certain actions such as making a transaction. There are four main categories of APIs: payment APIs, which help third parties make and receive payments; data APIs, which share individual (with proper customer consent) and aggregate data with third parties, enabling them, for example, to better understand the risk profiles of individuals; "ecosystem expansion" APIs, which enable loan origination or account creation; and "consent and identity" APIs that facilitate KYC, enable sharing of data and/or movement of money by third parties.

Automated Clearing Houses (ACH): An electronic clearing system in which payment orders are exchanged among financial institutions, primarily via magnetic media or telecommunications networks, and then cleared amongst the participants. All operations are handled by a data processing center. An ACH typically clears credit transfers and debit transfers, and in some cases also cheques.

Bank-led model: A digital financial services business model in which the bank is the primary driver of the product or service, typically taking the lead in marketing, branding and managing the customer relationship.

Basic payment account: A bank account that is typically focused on payment services and characterized by low-cost and no-frill features. These accounts are often offered in combination with a debit card.

Blockchain: A particular type of data structure used in some distributed ledgers which stores and transmits data in packages called "blocks" that are connected to each other in a digital 'chain'. Blockchains employ cryptographic and algorithmic methods to record and synchronize data across a network in an immutable manner.

Customer due diligence (CDD): Comprises the facts about a customer that should enable an organization to assess the extent to which the customer exposes it to a range of risks. These risks include money laundering and terrorist financing.

Digital currency: Can mean a digital representation of either virtual currency (non-fiat) or e-money (fiat) and thus is often used interchangeably with the term "virtual currency."

Digital financial inclusion: The use of digital financial services to advance financial inclusion. It involves the deployment of digital means to reach financially excluded and underserved populations with a range of formal financial services suited to their needs, delivered responsibly at a cost affordable to customers and sustainable for providers.

Digital financial services (DFS): Financial products and services, including payments, transfers, savings, credit, insurance, securities, financial planning and account statements that are delivered via digital/electronic technology such as e-money (initiated either online or on a mobile phone), payment cards and a regular bank account.

Digital ID: A set of electronically captured and stored attributes and credentials that can uniquely identify a person.

Distributed Ledger Technology (DLT): Distributed ledgers use independent computers (referred to as nodes) to record, share and synchronize transactions in their respective electronic ledgers (instead of keeping data centralized as in a traditional ledger). Blockchain is one type of a distributed ledger which organizes data into blocks, which are chained together in an append only mode.

E-money or electronic money: E-money is a record of funds or value available to a consumer stored on a payment device such as chip, prepaid cards, mobile phones or on computer systems as a non-traditional account with a banking or non-banking entity.

E-wallets or electronic wallet: E-Money product, where the record of funds is stored on a particular device, typically in an IC chip on a card or mobile phone.

Fast payment systems (FPS): An infrastructure focused on clearing and/or settlement of fast payments for its participants, where "fast payment" is defined as a payment in which the transmission of the payment message and the availability of "final" funds to the payee occur in real time or near-real time on as near to a 24-hour and seven-day (24/7) basis as possible.

Financial inclusion: The uptake and usage of a range of appropriate financial products and services by individuals and MSMEs (micro, small, and medium enterprises), provided in a manner that is accessible and safe to the consumer and sustainable to the provider.

Financial market infrastructure: A multilateral system among participating institutions, including the operator of the system, used for the purposes of clearing, settling, or recording payments, securities, derivatives, or other financial transactions.

Fintech: The advances in technology that have the potential to transform the provision of financial services spurring the development of new business models, applications, processes, and products.

Float: The amount of funds withdrawn from the account of the payer but not reflected immediately in the account of the payee. In the e-money context, float is typically referred to as the total value of outstanding customer funds.

Internet banking: Banking services that customers may access via the internet. The access to the internet could be through a computer, mobile phone, or any other suitable device.

Interoperability: A situation in which payment instruments belonging to a given scheme may be used in platforms developed by other schemes, including in different countries. Interoperability requires technical compatibility between systems but can only take effect where commercial agreements have been concluded between the schemes concerned.

Know your customer (KYC): Regulation that requires all financial institutions to ensure that they validate the identity of all of their clients.

Mobile money: E-money product where the record of funds is stored on the mobile phone or a central computer system, and which can be drawn down through specific payment instructions to be issued from the bearers' mobile phone. Also known as m-money.

Mobile money platform: Hardware and software that enables the provision of a mobile money service.

Mobile Network Operator (MNO): A company that has a government-issued license to provide telecommunications services through mobile devices.

Mobile payments: A type of e-payment, where the payment instrument used is a mobile money product. Mobile money is a type of e-money product where the record of funds is stored on the mobile phone or a central computer system, and which can be drawn down through specific payment instructions to be issued from the bearers' mobile phone.

Money transfer operator (MTO): A non-deposit taking payment service provider where the service involves payment per transfer (or possibly payment for a set or series of transfers) by the sender to the payment service provider (for example by cash or bank transfer) – i.e. as opposed to a situation where the payment service providers debits an account held by the sender at the payment service provider.

Non-bank-led model: A digital financial services business model in which the non-bank (usually an MNO) is the primary driver of the product or service, typically taking the lead in marketing, branding and managing the customer relationship.

Online money: E-money product where the record of funds is stored on a central computer system, and which can be drawn down through accessing this central computer system via Internet connection via a variety of devices (e.g., desktop PC, laptop, tablet, smart-phone).

Open banking: The sharing and leveraging of customer-permissioned data by banks with third party developers and firms to build applications and services, including for example those that provide real-time payments, greater financial transparency options for account holders, marketing and cross-selling opportunities.

Over-the-counter (OTC) service: Services in which a mobile money agent performs the transactions on behalf of the customer, who does not need to have a mobile money account to use the service.

Payment service provider (PSP): An entity that provides payment services, including remittances. Payment service providers include banks and other deposit-taking institutions, as well as specialized entities such as money transfer operators and e-money issuers.

Prepaid card: Payment card provided in exchange of prior deposit of funds specifically for use through this card product.

QR code: Quick response (QR) codes are two-dimensional barcodes that contain information that consumers or merchants can scan using the camera on their smartphones.

Real-time gross settlement (RTGS): The real-time settlement of payments, transfer instructions, or other obligations individually on a transaction-by-transaction basis.

Regtech: The use of technology to facilitate and enhance regulatory compliance.

Regulatory sandbox: Regulatory approach that aims to create a 'safe space' in which businesses can test innovative products, services, business models and delivery mechanisms in a live environment without immediately incurring all the normal regulatory consequences of engaging in the activity in question.

Suptech: The use of technology to facilitate and enhance supervisory processes from the perspective of supervisory authorities. This differs from Regtech, as Suptech is not focused on assisting with compliance with laws and regulations, but on supporting supervisory agencies in their assessment of that compliance.

Trust account: Account by held by non-bank payment service provider issuing e-money with a deposit-taking institution to deposit the outstanding e-money float.

Endnotes

[1] See for example Beck, T., R. Levine, and N. Loayza. "Finance and the Sources of Growth." *Journal of Financial Economic*s 58, no.1 (2000): 261–300, and Beck, T., A. Demirgüç-Kunt, and R. Levine. "Finance, Inequality, and the Poor." *Journal of Economic Growth* 12, no. 1 (2007): 27–49.

[2] See for example Demirguc-Kunt, Asli; Klapper, Leora; Singer, Dorothe. 2017. *Financial Inclusion and Inclusive Growth: A Review of Recent Empirical Evidence (English).* Policy Research Working Paper; no. WPS 8040. Washington, D.C.: World Bank Group. http://documents.worldbank.org/curated/en/403611493134249446/Financial-inclusion-and-inclusive-growth-a-review-of-recent-empirical-evidence.

[3] For example, research shows that mobile money services in Kenya reduced extreme poverty of women-headed households by 22 percent. Moreover, when faced with an income shock, mobile money users received more digital remittances and did not need to reduce consumption, whereas non-users did by 7 percent. Mobile money is also estimated to have lifted 2 percent of Kenyan households out of poverty. See Suri, T., and W. Jack. "The Long-Run Poverty and Gender Impacts of Mobile Money." *Science* 354, no. 6317 (2016): 1288–92, and Jack, W., and T. Suri. "Risk Sharing and Transactions Costs: Evidence from Kenya's Mobile Money Revolution." *American Economic Review* 104, no. 1 (2014): 183–223.

[4] Demirgüç-Kunt, et al (2018), op cit.

[5] See *The Bali Fintech Agenda*. Washington, DC: International Monetary Fund and World Bank Group, 2018, https://www.imf.org/en/Publications/Policy-Papers/Issues/2018/10/11/pp101118-bali-fintech-agenda.

[6] Bruhn, Miriam; Hommes, Martin; Khanna, Mahima; Singh, Sandeep; Sorokina, Aksinya; Wimpey, Joshua Seth. 2017. *MSME finance gap: assessment of the shortfalls and opportunities in financing micro, small, and medium enterprises in emerging markets (English)*. Washington, D.C.: World Bank Group. http://documents.worldbank.org/curated/en/653831510568517947/MSME-finance-gap-assessment-of-the-shortfalls-and-opportunities-in-financing-micro-small-and-medium-enterprises-in-emerging-markets.

[7] World Bank Remittance Prices Worldwide. https://remittanceprices.worldbank.org/en.

[8] For example, IFC estimates that for South Indian Bank, a shift of branch transactions to digital channels has given the bank an operational cost saving on fund transfers of INR 13 per transaction. For a discussion on costs, see for example: Philippon, T. (2020). *On Fintech and Financial Inclusion*. BIS Working Paper 841. Bank for International Settlements. https://www.bis.org/publ/work841.pdf.

[9] For more details on the Kenyan experience, see Chapter 3.

[10] Pasti, Francesco. *State of the Industry Report on Mobile Money 2018*. GSMA, 2019. https://www.gsma.com/r/wp-content/uploads/2019/05/GSMA-State-of-the-Industry-Report-on-Mobile-Money-2018-1.pdf.

[11] Demirgüç-Kunt, et al (2018), op cit.

[12] Emerging markets implementing digital ID could unlock value equivalent to 6 percent of GDP on average by 2030. See *Digital Identification: A Key to Inclusive Growth,* McKinsey Global Institute, 2019. https://www.mckinsey.com/~/media/McKinsey/Business%20Functions/McKinsey%20Digital/Our%20Insights/Digital%20identification%20A%20key%20to%20inclusive%20growth/MGI-Digital-identification-Report.ashx. Also see Lowmaster, Kaelyn. 2018. *Private Sector Economic Impacts from Identification Systems.* Washington, DC: World Bank ID4D. https://elibrary.worldbank.org/doi/pdf/10.1596/31828.

[13] Before Aadhaar, the average customer onboarding costs in India were estimated at around INR 1,500 (about USD $20) and took a few days. With Aadhaar, customer verification costs, a key component of the onboarding process, are around INR 20 (about USD $0.30) and near instant.

[14] For more details on the Indian experience, see Chapter 3.

[15] Demirgüç-Kunt, et al (2018), op cit.

[16] Demirgüç-Kunt, et al (2018), op cit.

[17] Demirgüç-Kunt, et al (2018), op cit.

[18] For example, the Aadhaar biometric system has enabled digital onboarding which has reduced customer time by 2 hours and the cost of opening an account by INR 4,420 per account for the bank.
[19] *G20 Policy Guide: Digitisation and Informality: Harnessing Digital Financial Inclusion for Individuals and MSMEs in the Informal Economy*. Global Partnership for Financial Inclusion and G20, 2018. https://www.gpfi.org/publications/g20-policy-guide-digitisation-and-informality-harnessing-digital-financial-inclusion-individuals-and.
[20] Demirgüç-Kunt, et al (2018), op cit.
[21] The success of the mobile money model in particular derives from scale economies of pooling small balances into "float accounts" held in the banking system.
[22] For example, F-Road is a company in China that enables rural banks and credit-cooperatives to offer mobile banking services to last-mile populations, primarily rural farmers living in remote areas. During 2014-2018, F-Road generated 7.5 million new mobile-banking users and facilitated 412 million non-cash transactions with total value of USD $1,256 billion and an accumulated USD $886 million direct transaction cost savings.
[23] For a broad set of policy issues to harness the benefits of DFS while managing risks, see International Monetary Fund and the World Bank Group (2018). "The Bali Fintech Agenda." For a set of policies to promote digital financial inclusion, see Global Partnership for Financial Inclusion (2016). "G20 High Level Principles for Digital Financial Inclusion." For the role of digital payments services to promote financial inclusion, see CPMI-World Bank Group (forthcoming). "Payment Aspects of Financial Inclusion in the Fintech Era."
[24] A rigorous evaluation of a social transfer program in Niger has shown that the variable cost of administering social transfer digitally is 20 percent lower than by manual cash distribution. In South Africa, the cost of disbursing social grants by digital means was one-third that of manual cash disbursement. In Mexico, a study estimates that the Mexican government's shift to digital payments trimmed its spending on wages, pensions, and social welfare by 3.3 percent annually, or nearly USD $1.3 billion. See also: Klapper, L., D. Singer. "The Opportunities and Challenges of Digitizing Government-to-Person Payments," *The World Bank Research Observer* 32, no. 2 (2017): 211–226.
[25] Case study evidence suggests leakage can be as high as 70 to 85 percent. See Muralidharan, K., P. Niehaus, and S. Sukhtankar. "Building State Capacity: Evidence from Biometric Smartcards in India." *American Economic Review* 106, no. 10 (2016): 895–929.
[26] El-Zoghbi, M., N. Chehade, P. McConaghy, and M. Soursourian. 2017. *The Role of Financial Services in Humanitarian Crises.* Washington, DC: CGAP. https://www.cgap.org/sites/default/files/Forum-The-Role-of-Financial-Services-in-Humanitarian-Crises_1.pdf.
[27] Suri and Jack (2016), op cit.
[28] Jack and Suri (2014), op cit.
[29] In Uganda, the expansion of mobile money agent networks doubled the non-farm self-employment rate, reduced travel costs by USD $1 (10 percent of per capita daily expenditures), and reduced food insecurity in areas far from a bank branch. See Wieser, C., M. Bruhn, J. Kinzinger, C. Ruckteschler, S. Heitmann. 2019. *The Impact of Mobile Money on Poor Rural Households*. Policy Research Working Paper 8913. Washington, DC: World Bank Group.
http://documents.worldbank.org/curated/en/134341561467884789/The-Impact-of-Mobile-Money-on-Poor-Rural-Households-Experimental-Evidence-from-Uganda.
[30] For active users, urban-to-rural remittances increased by 26 percent and rural consumption increased by 7.5 percent. See Lee, J., J. Morduch, S. Ravindran, A. Shonchoy, and H. Zaman. 2019. *Poverty and Migration in the Digital Age: Experimental Evidence on Mobile Banking in Bangladesh*. Working Paper. New York.
https://wagner.nyu.edu/files/faculty/publications/Lee%20et%20al%20-%20Poverty%20Migration%20Mobile%20Banking%20in%20Bangladesh%2011-3-18.pdf.
[31] In India, leakage was estimated to fall by almost 13 percentage points in response to the introduction of a biometric smartcard to facilitate government transfer to beneficiaries. See Muralidharan et al (2016), op cit.

[32] In the United States, the overall crime rate fell by over 9 percent in response to an electronic benefit transfer program. See Wright, R., E. Tekin, V. Topalli, C. McClellan, T. Dickinson, and R. Rosenfeld. "Less Cash, Less Crime: Evidence from the Electronic Benefit Transfer Program." *Journal of Law and Economics* 60, no. 2 (2017): 361– 83.
[33] Pasti, Francesco, GSMA (2019), op cit.
[34] In developing economies, digital person-to-business payments remain under 50 percent of total payments. Sub-Saharan Africa and South Asia lag behind with 20 and 25 percent of total payments, respectively. See Teima, Ghada, et. al. 2016. *Cash vs. Electronic Payments in Small Retailing: Estimating the Global Size*. Washington, DC: World Bank Group. http://pubdocs.worldbank.org/en/219031465585757849/WBG-Electronic-Payments-Small-Retailing.pdf.
[35] Currently, about 70 percent of transactions in mobile money systems are to get cash in or out. See Pasti, Francesco, GSMA (2019), op cit.
[36] See, for example, International Financial Corporation (2018). "Fintech", Thematic Brief No. 6.
[37] See, for example, International Monetary Fund and the World Bank (2019). "Fintech: The Experience so Far." For examples of fintech firms that focus on the poor, see Murthy, G., M. Fernandez-Vidal, and R. Baretto. "Fintechs and Financial Inclusion." CGAP Focus Note, 2019.
[38] See for example Chen, G., and X. Faz. "Open Data and the Future of Banking." CGAP Leadership Essay Series, 2019.
[39] Bull, Greta. "We Need to Talk About Credit." CGAP, April 18, 2019, https://www.cgap.org/blog/we-need-talk-about-credit.
[40] See, for example, "Insurtech." 2019. Thematic Brief No. 11. Washington, DC: International Financial Corporation. 2019.
[41] See Murthy et al (2019), op cit.
[42] See for example, Financial Stability Board. 2018. *Financial Stability Implications from Fintech: Supervisory and Regulatory Issues that Merit Authorities' Attention*. Washington, DC: International Monetary Fund and World Bank, op cit., and Financial Stability Board. 2019. *Fintech and Market Structure in Financial Services: Market Developments and Potential Financial Stability Implications*.
[43] Kaffenberger, M., E. Totolo, and M. Soursourian. 2018. *A Digital Credit Revolution Insights from Borrowers in Kenya and Tanzania*. CGAP Working Paper. Washington, DC: CGAP. https://www.cgap.org/sites/default/files/publications/Working-Paper-A-Digital-Credit-Revolution-Oct-2018.pdf.
[44] However, evidence from the U.S. suggests credit scoring models can reduce bias. See Philippon (2020), op cit.
[45] No checks have no minimum balance requirements and have a cap on the total balance.
[46] Tameer Microfinance Bank was part owned by Telenor (a telecom company), subsequently Telenor became a sole owner and renamed the institution Telenor Microfinance bank. Very recently Ant Financial took a 45 percent stake in Telenor Microfinance Bank.
[47] While regulatory reform might be the eventual end-product of all the above frameworks, some countries such as Mexico have chosen to introduce regulatory reform as the first step in the journey. The umbrella law here works to cover all fintech approaches and entities in the market and is modelled to allow the secondary legislation to be adapted as environment progresses without necessitating a change in law. This has been seen to be a useful approach under the civil law mandate under which Mexico operates. Other countries such as Thailand have adopted product-specific regulation such as specific laws for alternative finance such as peer-to-peer lending.
[48] IMF-World Bank. 2019. *Fintech: The Experience so Far*.
[49] Adapted from the IMF-WBG, Bali Fintech Agenda.
[50] A telecom messaging service originally intended for administrative functions.
[51] Adapted from the IMF-WBG. 2019. *Fintech: The Experience So Far*. Policy Paper no. 19/024. Washington, DC: International Monetary Fund and World Bank Group. https://www.imf.org/en/Publications/Policy-Papers/Issues/2019/06/27/Fintech-The-Experience-So-Far-47056.

[52] Findex website, https://globalfindex.worldbank.org/.
[53] Shepherd-Barron, Jo. 2015. *USAID Digital Payments India Merchant and Consumer Research Resources*. https://www.globalinnovationexchange.org/resources/usaid-digital-payments-india-merchant-and-consumer-research-resources.
[54] Subsidies for digital payments accepted by small businesses while reducing tax withholding requirements for firms and lowering value-added taxes for consumers.
[55] Allows wage earners to claim tax deductions for purchases made using digital payments.
[56] A "payment system" encompasses underlying ICT system, governance arrangements, membership rules, operating rules and procedures, and business rules including pricing. Wholesale payments system enables payments between financial institutions for financial market transactions or certain high-value time-critical payments on behalf of their customers while the retail payments system enables payments between the end users. Retail payment systems ultimately rely on the wholesale payment systems to settle between the relevant financial institutions holding the accounts of the financial institutions.
[57] CPMI-WB Payment Aspects of Financial Inclusion, 2016. Bank for International Settlements and World Bank Group.
[58] **"**Credit infrastructure" refers to the set of laws and institutions that enables efficient and effective access to finance, stability and socially responsible economic growth through information sharing, secured transactions & collateral registries, as well as insolvency and debt resolution processes.
[59] ABL products include factoring, reverse factoring, ABL revolving lines of credit and merchant cash advances.
[60] "Transformative Initiative in MSME Credit Space will Enable in Principle Approval for MSME Loans up to Rs. 1 crore within 59 minutes from SIDBI and 5 Public Sector Banks (PSBs)," *Press Information Bureau, Government of India, Ministry of Finance*, 25 September 2018. https://pib.gov.in/newsite/PrintRelease.aspx?relid=183682.
[61] "Guidelines on Electronic Know Your Consumer (e-KYC)," *Bangladesh Financial Intelligence Unit*, December 2019.
https://www.bb.org.bd/mediaroom/circulars/aml/jan082020bfiu25.pdf.
[62] Cirasino, Massimo; Baijal, Hemant; Garcia Garcia Luna, Jose Antonio; Kitchlu, Rahul. 2012.*General Guidelines for the Development of Government Payment Programs (English)*. Financial infrastructure series; payment systems policy and research. Washington, D.C.: World Bank Group. http://documents.worldbank.org/curated/en/883951468000286016/General-guidelines-for-the-development-of-government-payment-programs.
[63] Largely adapted from Digital Economy for Ghana Diagnostic Report, World Bank Group 2019; and CGAP case studies.
[64] Largely adapted from Digital Economy for Ghana Diagnostic Report, World Bank Group 2019; and CGAP case studies.
[65] These are e-money accounts maintained with commercial and rural banks in Ghana. The account holder gets a card carrying the e-zwich brand and is usable at all ATMs and POS terminals. These cards have offline functionality – allowing cardholder to use it at agents and merchants even when there is no network connectivity. More details available at https://ghipss.net/merchants/e-zwich-agent/18-e-zwich.
[66] BTCA, 2017.
[67] Findex 2017.
[68] BTCA, 2017.
[69] Ibid.
[70] See Business Desk Report, available at https://www.ghipss.net/products-services/e-zwich/banking/interest-rate-on-e-zwich-card/12-blog/investment/165-mobile-money-interoperability-hits-800-000-transactions-report.
[71] See CGD (2019) "Public Financial Management and the Digitalization of Payments."
[72] See Fields et. al. 2019. "On Her Own Account: How Strengthening Women's Financial Control Impacts Labor Supply and Gender Norms." https://drive.google.com/file/d/0B-p3exE7U7m1SnNsX21YdG4wclE/view.

[73] Other key payments systems include the Immediate Payment System (IMPS) - an instant retail payment system for all channels – and the Aadhaar Enabled Payment System (AEPS) which allows consumers to conduct interoperable financial transactions at Micro-ATMS in any bank's business correspondent by just authenticating their Aadhaar.
[74] For example, their banks name and code, account number, address and account holder name
[75] Reserve Bank of India. "Consumer Education and Protection." Available at https://www.rbi.org.in/scripts/FS_Overview.aspx?fn=2745, and Reserve Bank of India. January 13, 2019. "The Reserve Bank introduces Ombudsman Scheme for Digital Transactions," available at https://www.rbi.org.in/scripts/FS_PressRelease.aspx?prid=46163&fn=9.
[76] Reserve Bank of India. 2019. "Customer Protection – Limiting Liability of Customers in Unauthorised Electronic Payment Transactions in Prepaid Payment Instruments (PPIs) issued by Authorised Non-banks." https://www.rbi.org.in/scripts/FS_Notification.aspx?Id=11446&fn=9&Mode=0
[77] The Government is instituting tax rebates, requiring banks to waive all fees for small merchant transactions, digitizing transportation payments and pursuing digitization of all G2P programs including those managed by state Governments.
[78] Joseph, Michael. *FY 2008-2009 Annual Results Presentation and Investor Update*. Safaricom May 2009. https://www.safaricom.co.ke/images/Downloads/Annual_Reports/2008-2009_results_announcement_and_investor_update.pdf.
[79] Tavneet Suri, William Jack. "The Long-run Poverty and Gender Impacts of Mobile Money." *Science Magazine* 354, no. 6317 (December 2016): 1288 – 1292. http://science.sciencemag.org/content/sci/354/6317/1288.full.pdf.
[80] See Kaffenberger, Totolo, and Soursourian. 2018. A *Digital Credit Revolution: Insights from Borrowers in Kenya and Tanzania*. https://www.cgap.org/sites/default/files/publications/Working-Paper-A-Digital-Credit-Revolution-Oct-2018.pdf.
[81] FinAcces. *2019 FinAccess Household Survey*. Nairobi: Central Bank of Kenya, 2019, available at https://www.centralbank.go.ke/wp-content/uploads/2019/04/2019-FinAcces-Report.pdf.
[82] The assessment concluded that cash exchanged for e-money does not represent deposits because it remained in control of the customer at all times. M-Pesa agents were required to deposit e-float upfront in an M-Pesa wallet, which in turn was held by a local bank in a trust account. As such there is no credit risk to either the customer or Safaricom.
[83] See more details at Alliance for Financial Inclusion. 2010. *Enabling Mobile Money Transfer. The Central Bank of Kenya's Treatment of M-Pesa*. https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2013/09/enablingmobilemoneytransfer92.pdf.
[84] As of 2019, the CBK has imposed additional requirements, including a diversification requirement, which obliges Safaricom to store a maximum of 25 percent of e-float in a single bank (once e-float exceeds USD $950,000) and at least two of the banks storing the e-float must be strong-rated. Moreover, income from the trust accounts can be used only in accordance with the trust legislation or donated to a public charity, but not paid out to customers.
[85] See MicroSave. 2019. *Making Digital Credit Truly Responsible*. https://www.microsave.net/wp-content/uploads/2019/09/Digital-Credit-Kenya-Final-report.pdf.
[86] In addition, the regulatory framework incentivized competition in the mobile money market. The EMI Guidelines mandated agent non-exclusivity. This allowed Tigo to leverage Vodacom's exiting agent network by focusing on recruiting existing M-Pesa agents to offer their services as well. However, the number of mobile phone accounts fell in 2016, when the communications regulator required the MNOs to deactivate all improperly registered SIM cards. This also resulted in a drop of 8 percent in mobile money account penetration, to 53 percent.
[87] "A Digital Credit Revolution: Insights from Borrowers in Kenya and Tanzania." CGAP/FSD, October 2018.
[88] PwC. 2017. *Fintech India Report 2017*. https://www.pwc.in/assets/pdfs/publications/2017/fintech-india-report-2017.pdf.

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