



DIGITAL FINANCIAL SERVICES (DFS) WORKING GROUP



GLOBAL STANDARDS PROPORTIONALITY (GSP) WORKING GROUP

BRINGING SMART POLICIES TO LIFE

# FINTECH FOR FINANCIAL INCLUSION: A FRAMEWORK FOR DIGITAL FINANCIAL TRANSFORMATION



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## OVERVIEW - SEPTEMBER 2018

The full potential of FinTech for financial inclusion may be realized with a strategic framework of underlying infrastructure and an enabling policy and regulatory environment to support digital financial transformation. Drawing from experiences in a range of developing, emerging and developed countries, our research suggests that the best approach is staged and progressive, focused on four main pillars.

The first pillar is building digital identification and e-KYC systems to simplify access to the financial system. Once these are established for individuals and businesses, they provide a solid foundation not only for finance, but also for the development of the digital economy more broadly.

The second pillar is digital payment infrastructure and open electronic payments systems, the primary way to facilitate digital financial flows in an economy.

The third pillar combines the promotion of account opening and access with the electronic provision of government services, particularly for public transfers and payments, to scale up the use of digital finance and related services. By supporting access, payments and savings, together these three pillars provide a foundation for digital financial transformation and financial inclusion.

The fourth and final pillar - design of digital financial markets and systems - builds on the first three to support broader access to finance and investment, by underpinning use cases including securities trading, clearing and settlement, and other more sophisticated financial functions.

Finally, there is a need for regulatory approaches that support and adapt to these four pillars. This is a major journey for any economy, but one that experience increasingly suggests has tremendous potential to transform financial inclusion and support digital economic development.



# INTRODUCTION

Access to finance, financial inclusion and financial sector development have long been major policy objectives. Over the last century, a series of initiatives have aimed to increase access to finance and financial inclusion, but these have accelerated in the last decade as technological developments combined with strategic policy support show potential for progress beyond anything that has been achieved.

The World Bank's 2017 Global Findex shows that in the last three years, 515 million adults acquired a financial account, and between 2010 and 2017, 1.2 billion people opened an account with a formal financial institution or mobile financial services provider (including mobile money) for the first time.<sup>1</sup> This is impressive progress by any measure, but much remains to be done: as of 2017, 1.7 billion people 16 years or older still did not have access to an account, some 31 percent of the world's adult population.

The number of financially excluded are still disproportionately higher in developing and emerging market countries, but there has been substantial progress, as most of the 1.2 billion people who gained access to an account for the first time in the last eight years live in developing countries and emerging markets. Particular progress has been made in East Africa, China and India.

### WHAT ACCOUNTS FOR THESE DEVELOPMENTS?

From 2010 to 2017, much of the progress was related to the impact of financial technology (FinTech) in a number of countries. Three examples stand out. The first is the development of mobile money, particularly in Kenya and East Africa,<sup>2</sup> where this type of FinTech has done the most to promote financial inclusion (if narrowly defined as ensuring access to financial services),<sup>3</sup> allowing the unbanked to make payments, remit funds and save using their mobile phone.

The second example is China, where a traditional and not overly efficient financial system became one of the world's most digitized financial systems.<sup>4</sup> This process was accompanied by the single greatest decrease in poverty in world history.

The third major example is India, where financial access increased dramatically in a very short time. As of 2017, 80 percent of adults in India had an account. This is the result of a major strategy to build an ecosystem for a new digital economy and financial system (i.e. "India Stack"), in particular, underlying infrastructure and an enabling policy environment. Among other things, this has led to approximately 350 million people gaining access to accounts for the first time.

## KEY FACTS

**515** MILLION ADULTS  
ACQUIRED A FINANCIAL  
ACCOUNT BETWEEN  
2010 - 2017



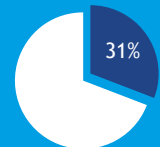
**1.2** BILLION PEOPLE  
OPENED AN ACCOUNT WITH  
A FORMAL INSTITUTION OR  
MOBILE FINANCIAL SERVICE  
PROVIDER



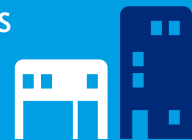
**80%** OF ADULTS  
IN INDIA HAVE ACCESS TO AN ACCOUNT  
IN 2017 AS A RESULT OF  
FINTECH



**31%**  
OF THE WORLD'S ADULT  
POPULATION STILL DO NOT  
HAVE ACCESS TO AN ACCOUNT



**>200** MILLION BUSINESSES  
AND 1.7 BILLION PEOPLE  
REMAIN FINANCIALLY  
EXCLUDED



**2/3**  
OF THE 1.7 BILLION  
UNBANKED ADULTS IN  
2017 HAVE A MOBILE PHONE



**MOBILE MONEY**  
HAS PLAYED A MAJOR ROLE  
IN ADVANCING FINANCIAL  
INCLUSION, THE MOBILE  
PHONE IS ARGUABLY THE  
MOST POWERFUL INSTRUMENT  
OF DEVELOPMENT IN HISTORY



Source: World Bank's 2017 Global Findex

However, beyond account access, India, like China, is experiencing a transformational reduction in extreme poverty to the extent that it no longer has the world's largest number of people living in extreme poverty.<sup>5</sup>

These developments are part of a global phenomenon known as financial technology or 'FinTech': the interaction between finance, technology and regulation. While finance and technology have a long relationship, a new FinTech era has emerged characterized by an unprecedented speed of change and a growing range of new participants, from startups to banks to e-commerce companies. Today's FinTech encompasses not only the digitization and datafication of global financial markets, but also the emergence of new startups ("FinTechs")<sup>6</sup> around the world, the technological transformation of finance through digital financial services in developing countries, and most recently the emergence of giant technology firms engaging in finance ("TechFins").<sup>7</sup>

#### WHAT CAN WE LEARN FROM THE EXPERIENCES AND TRENDS IN FINTECH OVER THE LAST DECADE?

In particular, what steps can developing and emerging markets take to increase financial inclusion and economic development through FinTech?

Mobile money has played a major role in advancing financial inclusion, and the mobile phone is arguably the most powerful instrument of development in history. As it originally developed in East Africa, mobile money was usually led by telecom firms and focused on feature phones – relatively simple devices limited in their potential application. As useful and important as mobile money is, FinTech has far greater potential to promote financial inclusion through transformative digital financial services and economic development. While important, mobile money is only one aspect of building a broader ecosystem to support digital financial transformation.

This paper makes the case that to reap the greatest benefits for financial inclusion and maximize the potential of FinTech, a framework that supports infrastructure and an enabling policy and regulatory environment, built on a strong foundation of digital identification and electronic payment systems, will support much broader digital financial transformation.

In addition to India, a growing number of other economies are developing and implementing such strategies, including Thailand,<sup>8</sup> the Philippines,<sup>9</sup> Bangladesh<sup>10</sup> and the EU.<sup>11</sup> A similar strategy is being implemented as part of the global response to historically unprecedented levels of forced displacement, particularly in Jordan where UNHCR (the UN Refugee Agency) has partnered with the government and a private company to provide identity systems based on iris scans and combined with electronic accounts.<sup>12</sup>

Despite these achievements, significant work is needed to assist the 1.7 billion people and over 200 million businesses that remain financially excluded.<sup>13</sup> What lessons can we draw from successes and failures to date? What sorts of strategies should financial policymakers and regulators pursue? There are reasons to be optimistic: of the

1.7 billion unbanked adults in 2017, two-thirds have a mobile phone. Although smartphone penetration levels are not high, they are increasing rapidly, and appropriate strategies to support the ecosystem, infrastructure and policy environment for a transformative digital financial system, financial inclusion and economic development are a real possibility for many economies.

Despite massive progress in China and India, these countries still have the largest unbanked populations in the world in 2017: 225 million in China and 190 million in India.<sup>14</sup> Increasingly, the unbanked are those who do not have access to a mobile phone, and this digital divide remains a major challenge. However, the gap appears to be closing every day as the costs of mobile phones and smartphones continue to drop and could be reduced further with foundational digital financial infrastructure.



# FINANCIAL INCLUSION: WHAT HAVE WE LEARNED SO FAR?

This section addresses three questions: (a) what is financial inclusion and why is it so important; (b) what lessons have we learned from different initiatives to support financial inclusion; and (c) what is FinTech and what types of FinTech are most likely to advance financial inclusion?<sup>15</sup>

## A. FINANCIAL INCLUSION: WHY IT MATTERS

Financial inclusion involves the delivery of financial services at an affordable cost to all segments of society.<sup>16</sup> According to the Alliance for Financial Inclusion (AFI), “[a]ccess to financial services is the grounding principle” of financial inclusion.<sup>17</sup> AFI’s Financial Inclusion Data (FID) Working Group, defines the three main dimensions as access, usage and quality.<sup>18</sup> Today, financial inclusion is a significant international policy goal,<sup>19</sup> including as an enabler of many of the UN Sustainable Development Goals (SDGs).<sup>20</sup>

In 2015, approximately two billion people (roughly 38 percent of the world’s adult population) did not have a formal bank account.<sup>21</sup> Figures for 2018 show a substantial drop in this figure, indicating that we are making progress but still have far to go. The majority of the unbanked live in developing economies and emerging markets and are unable to procure, or deliver, the necessary paperwork to open an account, or if they can afford an account,<sup>22</sup> cannot afford the time off work and travel costs to attend a branch.<sup>23</sup>

Financial inclusion is vital to improving the livelihoods of the poor and disadvantaged. Providing people in developing countries with access to financial services, such as payments, savings, insurance and credit, helps them to manage their financial obligations and build better futures for their families while also supporting broad economic growth, development and poverty reduction.<sup>24</sup>

This is achieved, first, by making individuals less vulnerable by enabling them to save so as to increase their resilience, and invest in their education, health and microbusinesses.<sup>25</sup> Second, financial inclusion can make the management of daily life far more efficient: electronic payments allow people to pay for essential services without taking time off work to pay the bills in person.<sup>26</sup> Third, inclusion enables the shifting of financial risks from individuals to the financial system where these risks can be socialized and diversified, for instance, insurance against severe illness of the family breadwinner(s) can prevent people from falling back into poverty.<sup>27</sup> Fourth, financial inclusion supports economic growth by expanding access to financial resources that support real economic activity,

particularly for individuals and micro, small and medium-size businesses (SMEs). It also supports broader economic growth by underpinning a local currency based financial system in which local savings fund local investments. This is a particular, longer-term benefit as the less a financial system is dependent on foreign debt, the less it is exposed to external shocks.<sup>28</sup>

## B. A RENEWED FOCUS ON FINANCIAL INCLUSION: AFI AND THE G20

The 2008 global financial crisis prompted a renewed focus on financial inclusion and financial system reform. AFI was established in 2008 by a group of developing country central banks to focus exclusively on supporting financial inclusion. As of July 2017, the AFI network represented 85 percent of the global unbanked population.<sup>29</sup>

At its annual Global Policy Forum in 2012, its members signed the historic Maya Declaration on Financial Inclusion, a framework for developing countries to commit to concrete financial inclusion targets and national policy changes.<sup>30</sup> Several other AFI agreements followed the Maya Declaration, including the Sasana Accord and, most recently, the Sharm El Sheikh Accord, which recognizes the relationship between climate change and financial exclusion and sets quantified targets for green finance and climate change.<sup>31</sup> AFI’s current regional initiatives include the African Financial Inclusion Policy Initiative (AfPI), the Financial Inclusion Initiative for Latin America and the Caribbean (FILAC), the Pacific Islands Regional Initiative (PIRI) and Financial Inclusion in the Arab Region Initiative (FIARI).

The 2008 financial crisis also prompted sweeping regulatory responses coordinated by the Group of 20 (G20) aimed at building a resilient global financial system.<sup>32</sup> As part of its core efforts, the G20 has focused much attention on supporting economic growth, including through financial inclusion and financial development to support real economic activity and poverty reduction.

At the Pittsburgh Summit in September 2009, G20 leaders committed to improve access to financial services for the poor.<sup>33</sup> They established the Financial Inclusion Experts Group (FIEG), which developed nine principles for innovative financial inclusion.<sup>34</sup> The FIEG also recommended the creation of the Global Partnership for Financial Inclusion (GPFI), which was established at the Seoul Summit in November 2010, and at which the G20 leaders endorsed the first Financial Inclusion Action Plan (FIAP).<sup>35</sup> Along with the World Bank and others, AFI was invited as a key implementing partner of the GPFI, with a special mandate to facilitate outreach to non-G20 developing and emerging economies.

## C. DIGITAL FINANCIAL INCLUSION

AFI and the GPFI, among others, have identified technology as a core aspect of financial inclusion. AFI established the Digital Financial Services (DFS) Working Group in 2010,<sup>36</sup> and technology is a key consideration for other AFI working groups, reflected in a growing range of events,

activities and studies, most recently the creation of a new workstream, FinTech for Financial Inclusion.

In 2016, the GPMI formally recognized digital financial solutions as critical tools in facilitating global financial inclusion,<sup>37</sup> and introduced the G20 High-Level Principles for Digital Financial Inclusion (HLPs).<sup>38</sup> Together with two accompanying initiatives – the Recommendations for Responsible Finance<sup>39</sup> and the ID4D<sup>40</sup> – the HLP aimed to encourage governments to embrace digital approaches to financial inclusion,<sup>41</sup> and to guide countries in designing and implementing digital solutions of their own.<sup>42</sup> Numerous countries are currently implementing policies in accordance with the HLPs,<sup>43</sup> as well as national financial inclusion strategies coordinated by AFI. In 2017, the FIAP was updated to reflect the vital role of digitization.<sup>44</sup> The GPMI reaffirmed digitization as a cross-cutting issue across all its initiatives.<sup>45</sup> Likewise, digital financial services and FinTech have been identified as key strategic areas for financial inclusion by AFI and its members.

This study was undertaken to support AFI’s new workstream on FinTech for Financial Inclusion, in recognition of the great potential of technological innovation, coupled with enabling regulation and policy, to continue expanding financial inclusion globally. Based on AFI’s review, several key elements of a strategic approach to FinTech for Financial Inclusion are emerging and form the core of AFI’s strategy in the context of this workstream.<sup>46</sup> These include:

- > Creating opportunities to systematically build a knowledge repository for financial regulators on FinTech for financial inclusion.
- > Enabling test-and-learn approaches to FinTech for financial inclusion.
- > In collaboration with global standard-setting bodies (SSBs) and experts in the field, providing additional regulatory guidance on risk proportionality and peer learning efforts based on practical examples from regulators in the network that will lead to better policies for financial inclusion.
- > Facilitating peer learning, knowledge sharing and capacity building among regulators, including sharing lessons on effective approaches to balancing financial innovations with other key public policies of financial stability and financial inclusion.
- > Incorporating FinTech into national financial inclusion strategies.
- > Enhancing public-private dialogue (PPD) and global dialogue with the private sector, technology companies, researchers, development partners and regulators from developed and developing economies.

In the context of AFI’s overall strategic approach to FinTech and financial inclusion, this paper analyzes member experiences to date to draw lessons for policymakers around the world.

## D. FINTECH AND FINANCIAL INCLUSION

FinTech is a new term for a long-standing phenomenon: the application of technology in finance.<sup>47</sup> With the advent of cloud computing, smartphones and high-speed internet, the sector has expanded dramatically over the last decade.<sup>48</sup> Today, FinTech describes a new era of digital finance around the world that extends from the application of artificial intelligence and machine learning to big data, and from the use of biometric identification to blockchain technology. What types of FinTech innovation will have the biggest impact on those who remain financially excluded?

The most obvious answer is mobile money – the provision of e-money on mobile phones – where the greatest success story was in Kenya with Vodafone’s M-Pesa product. However, the real opportunity FinTech affords is the development of an entire digital financial ecosystem that meets the needs of both individuals and SMEs. This is the essential next phase in the journey to comprehensive financial inclusion and vital to digital economic development and broader financial sector development.

Based on experiences to date, we suggest a framework for FinTech for financial inclusion based on four major pillars. Together with supporting infrastructure and an enabling policy and regulatory environment, these pillars provide a foundation for an evolving digital financial ecosystem and help economies maximize the financial inclusion benefits from FinTech while also balancing financial stability, consumer protection and financial integrity.

These four pillars are:

**PILLAR I**  
DIGITAL ID AND eKYC FOR IDENTIFICATION AND SIMPLIFIED ACCOUNT OPENING

**PILLAR II**  
OPEN ELECTRONIC PAYMENT SYSTEMS, INFRASTRUCTURE AND AN ENABLING REGULATORY AND POLICY ENVIRONMENT THAT FACILITATE THE DIGITAL FLOW OF FUNDS FROM BOTH TRADITIONAL FINANCIAL INTERMEDIARIES AND NEW MARKET ENTRANTS

**PILLAR III**  
ACCOUNT OPENING INITIATIVES AND ELECTRONIC PROVISION OF GOVERNMENT SERVICES, PROVIDING VITAL TOOLS TO ACCESS SERVICES AND SAVE

**PILLAR IV**  
DESIGN OF DIGITAL FINANCIAL MARKET INFRASTRUCTURE AND SYSTEMS THAT, IN TURN, SUPPORT VALUE-ADDED FINANCIAL SERVICES AND PRODUCTS AND DEEPEN ACCESS, USAGE AND STABILITY.

## E. CASE STUDY: INDIA STACK

These four pillars have formed an integrated strategy in India and had an impressive impact. India Stack is a set of systems, policies and APIs (application programming interfaces) that enable government, businesses and others to use its digital infrastructure to support a range of paperless and cashless services.<sup>49</sup>

India Stack is comprised of four main levels,<sup>50</sup> which together are making India's financial sector more efficient, expanding access to financial services across the country, opening the market to competition from entrepreneurs, start-ups and IT/e-commerce firms, supporting economic growth and development, and reducing poverty.

The first level is a national system of biometric identification, Aadhaar. Identity is at the base of most financial access issues, and in India, addressing this has involved developing biometric national identification cards based on 10 fingerprints and two retina scans. These IDs have been issued to more than a billion people since 2010.<sup>51</sup>

The second level is the establishment of bank accounts to deliver national services, such as pension, health and other social welfare payments. To date, over 200 million bank accounts have been opened as part of this process.

The third level is a common payment API to enable payments to be made by anyone through a common system supported by the Reserve Bank of India (RBI).

The fourth level involves a series of electronic KYC initiatives that allow individuals to maintain details of their financial affairs and provide these details to financial services and other providers to meet KYC requirements. These eKYC utility platforms show how RegTech – regulatory technology – can strengthen the integrity of financial markets and reduce counterparty risks.

Apart from infrastructure, enabling policy ecosystems play a big role in advancing financial inclusion. In India, some of the policy/regulatory considerations that have propelled financial inclusion include allowing correspondent banking with relaxed KYC norms; allowing payment and small finance banks and thereby permitting new players such as telecommunications and FinTech firms into the market; allowing Aadhaar/eKYC to open accounts; and developing a national financial inclusion strategy with a focus on digitizing government-to-person (G2P) payments.

More and more countries are developing similar strategies to that of India. In the following sections, we highlight the core elements of these strategies and the lessons that have been learned to date.





# PILLAR I: EMPOWERING ACCESS: DIGITAL IDENTIFICATION, EKYC AND SIMPLIFIED ACCOUNT OPENING

Experience shows that identity, and digital identity in particular, is central to digital financial inclusion and the transformation of digital finance. This is a particular challenge in developing countries where large segments of the population often lack any form of formal identification. Formal legal identity for all is included in the Sustainable Development Goals, and the World Bank has taken a leading role with its ID4D (Identity for Development) initiative launched in 2014.

According to the ID4D 2018 Global Dataset,<sup>52</sup> as of 2017, one billion people face challenges in proving their identity. Of these, 47 percent are under the national ID age and mainly live in developing countries, where 40 percent of people lack officially recognized identification compared to 20 percent in lower middle-income countries and just five percent in upper middle-income countries. Eighty-one percent of those without ID live in Sub-Saharan Africa and South Asia.

Lack of identification is a clear barrier to financial access, particularly in the context of international standards for customer identification and due diligence. The 2018 Global Findex highlights that 19 percent of the 1.7 billion adults without an account cited lack of necessary documentation as the main reason. At the same time, this shows the potential of digital identification to have a major and transformative impact.

Digital ID is the basis of a strategy for digital financial inclusion. Beyond simple proof of identity, in countries without extensive bank branch networks, a digital ID allows a person or SME to open an account without having to present themselves in person. The 2018 ID4D Global Dataset shows that 161 countries now have some sort of identification system using digital technology which, while introducing data security and privacy risks, has important potential opportunities for digital financial inclusion.

## A. EXAMPLE: INDIA'S AADHAAR SYSTEM

India's Aadhaar system is the first level of India Stack. It is operated by the Unique Identification Authority of India (UIDAI) and involves issuing a 12-digit randomized number to all residents on a voluntary basis. Since it launched, it has been increasingly used to access government services, social benefits and banking and insurance, among others. Enrolment to obtain an Aadhaar number is free, and a

process of biometric deduplication aims to ensure only one number is generated for each individual. The Aadhaar number then acts as a proof of identity.<sup>53</sup>

The Aadhaar system also provides for a number of methods of updating data, which is important as it can be linked to a growing number of services. For example, biometric data can be updated as children grow, in the case of accident or disease, or as the quality of technology improves.<sup>54</sup>

Aadhaar has proven extremely useful in the context of financial inclusion, making access to financial accounts easier, enabling digitization of government payments and services (when combined with other elements of the India Stack strategy), increasing efficiency and lowering costs. Although there is a correlation between Aadhaar and levels of financial access in India (as highlighted in the Global Findex), it has also introduced a range of issues, especially around privacy and data protection.

To gain a clearer picture of Aadhaar's impact, IDInsight and Omidyar launched the "State of Aadhaar" to study data as it becomes available. The main conclusion so far has been that Indians generally approve of government use of Aadhaar for identification purposes and, to a lesser extent, private sector use. However, the study also found high levels of concern about data protection.<sup>55</sup>

The most significant problems with the implementation of Aadhaar have been around data security. The Aadhaar Authentication Regulations 2016 provides for transaction data to be archived for five years, and Aadhaar has even been described as 'mass surveillance technology'.<sup>56</sup> At the time of writing, the Aadhaar system is subject to a hotly debated constitutional challenge in the Supreme Court of India. It is being argued that the identity cards are a breach of privacy and that data is being collected by third-party contractors without proper safeguards in place. It is also argued that fingerprinting and iris scanning are susceptible to misuse and fraud.<sup>57</sup> In related proceedings in mid-2017, a nine-judge bench of the Supreme Court of India held that Indians have a right to privacy, but declined to rule on the constitutional validity of the system.<sup>58</sup>

However, Aadhaar has also proven extremely beneficial. For example, billions of rupees of financial benefits previously lost annually through fraud and corruption are now finding their way to the intended recipients. Government estimates suggest there have been important savings as a result of the availability and use of Aadhaar to provide government services and transfer payments, with The Economist highlighting estimates that savings have been as high as USD five billion.<sup>59</sup> In some states of India, before Aadhaar and associated financial services, up to 45 percent of government welfare payments were failing to reach their intended recipients due to 'leakage'.

Difficulties with implementation should not detract from the potential of a national biometrically-based identification system to underpin a digital financial ecosystem. Digital ID, however it is established and validated, provides a necessary and solid foundation for the rest of a digital financial ecosystem, including sophisticated and advanced payments infrastructure,

streamlined account opening procedures, systems that support the payment of government benefits and other payments into those accounts, and a financial system that provides credit to individuals and SMEs on the basis of credit scores compiled from diverse and accurate data.

Such a comprehensive digital financial ecosystem will transform governance and service delivery and deliver economic gains that can be used to fund investments in education, health, roads and other infrastructure. It will likewise transform the payment of government benefits, dramatically reduce losses from corruption, and allocate credit to allow SMEs, the primary employers in most countries, to thrive.

The experiences of the UN and Jordan with developing a digital identity solution for refugees are good examples of collaborative system design and development.

## B. IRISGUARD

IrisGuard is an iris recognition technology that uses algorithms to convert an image of an iris into a unique code that is then used to identify an individual.<sup>60</sup> Since 2016, IrisGuard's EyePay platform has been used by the UN, especially the World Food Programme, to deliver financial aid. Iris recognition technology provides beneficiaries with sufficient digital identity to receive food vouchers, withdraw cash and transfer funds on the spot without requiring a credit card or bank account. The system depends on the biometric data of refugees collected by UNHCR.<sup>61</sup>

In early 2018, IrisGuard entered into an agreement with IFC, a World Bank Group member, to use this technology to promote financial inclusion for Syrian refugees in Jordan by using EyePay in conjunction with the Ethereum blockchain to process supermarket and ATM transactions securely in real time.<sup>62</sup> Over 2.3 million refugees have registered for the system and, as of April 2018, the platform has been rolled out to five supermarkets in refugee camps in Jordan, serving over 120,000 Syrian refugees.<sup>63</sup>

Secure technology is important for vulnerable individuals to protect themselves and their money from corruption and identity theft. Iris recognition and distributed ledger technology work toward this goal by providing an immutable form of digital identity and rendering physical cash, cards and vouchers unnecessary.

Similarly, using blockchain technology to transfer funds internationally can cut huge costs from bank transfer fees. In 2016, the World Food Programme's cash transfers amounted to USD 880 million in about 80 countries.<sup>64</sup> Eliminating bank transfer fees for these transactions will allow funds to be deployed elsewhere.

Based on these experiences, UNHCR established its Strategy on Digital Identity and Inclusion in 2018.<sup>65</sup>

## C. REGIONAL APPROACHES: eIDAS IN THE EU

The eIDAS Regulation was adopted in 2014 to provide mutually recognized digital identity for cross-border

electronic interactions between European citizens, companies and government institutions. Member states can notify the European Commission of their national form of eID, and other member states are then required to recognize it by September 2018 (although they have been able to recognize other states' eIDs voluntarily since 2015). Once the eID is recognized throughout the EU, an individual will be able to use it in any member state.<sup>66</sup> The eID is assigned a certain level of assurance based on its security specifications, allowing states to determine the services for which it may be used.<sup>67</sup>

This system does not make the sovereign form of identity redundant, but allows national forms of digital identity to be recognized throughout the EU.

## D. PRINCIPLES ON IDENTIFICATION FOR SUSTAINABLE DEVELOPMENT

Drawing on these experiences and lessons, the World Bank has coordinated the development of Principles on Identification, which have been endorsed by a wide range of organizations.<sup>68</sup> The Principles explicitly recognize the importance of identification in financial inclusion and economic development:

*"We believe that every person has the right to participate fully in their society and economy. Without proof of identity, people may be denied access to rights and services — they may be unable to open a bank account, attend school, collect benefits such as social security, seek legal protection, or otherwise engage in modern society. No one should face the indignity of exclusion, nor be denied the opportunity to realize their full potential, exercise their rights, or to share in progress. No one should be left behind."*<sup>69</sup>

The Principles not only highlight the role of legal identification in the context of SDG 16.9, but in a range of others, including financial inclusion.<sup>70</sup> From the standpoint of building infrastructure, it is vital to consider how digital IDs can be extended to as much of the population as possible to maximize efficiencies.

Beyond individuals, similar systems can also be considered for corporations, such as the Legal Entity Identifier system (LEI).

## E. eKYC AND KYC UTILITIES

Base identity is essential in and of itself, but when linked electronically with data like tax and address information, it provides the basis for a simple eKYC system that can dramatically reduce account opening costs while also addressing concerns about market integrity (e.g. anti-money laundering). Recent research from Microsave highlights the benefits of eKYC in the context of financial inclusion and market integrity.<sup>71</sup>

The core objective of eKYC is to make it as simple and inexpensive as possible for most people and entities to open accounts, including SMEs, and allow resources to

be focused on higher risk customers to support financial inclusion and market integrity.

Performing and verifying customer identity and conducting customer due diligence (CDD), both when onboarding new customers and providing ongoing services, are vital to maintaining market integrity. This process is embodied in a range of AML/CFT/CDD requirements based on internationally agreed approaches, and is the basis for understanding customer needs, which is essential to providing appropriate financial services.

#### EXAMPLE 1: SOUTH AFRICA'S WEB-BASED KYC DATABASE

One approach to KYC compliance that does not rely on digital biometric identification has been taken in South Africa, where three major financial institutions and Thomson Reuters have partnered to create a web-based database of KYC information. The service collects KYC information from the customer, verifies it once and then distributes it to all the institutions the customer chooses, allowing them to control who can access their information. The centralized database avoids duplication and streamlines account opening procedures for the customer at no cost.<sup>72</sup> The benefits of this system are not yet fully apparent as not all financial institutions have chosen to participate, but as adoption increases so should efficiency.

#### EXAMPLE 2: INDIA'S e-KYC SYSTEM

In India, a paperless eKYC service based on the Aadhaar digital identity system has been developed to instantly establish the identity of prospective banking customers. When customers consent to the service making their identity available, it provides proof of identity to service providers that cannot be repudiated. The India Stack e-signature layer also interacts with eKYC.<sup>73</sup> The digitization of identity authentication streamlines the account opening process and gives all consenting customers easy access to both digital and traditional financial services.<sup>74</sup>

Axis Bank was the first in India to offer an eKYC account-opening facility in late 2013. This service reduced the turnaround time for opening a bank account from 7-10 days to just one day.<sup>75</sup> Today, many financial services providers (traditional banks, payment banks, non-bank financial companies, insurance companies, etc.) and non-financial services providers (telecom companies, government institutions, etc.) in India leverage e-KYC to open transaction accounts and provide other related services.<sup>76</sup>

The Aadhaar e-KYC service has become so prevalent that, as of August 2018, over 22 billion authentications of identity and over six billion e-KYC requests have been processed.<sup>77</sup> Despite the rapid uptake, there have been issues with some entities using e-KYC to open accounts without obtaining express consent from customers. In response, the Reserve Bank of India issued a new directive on KYC norms for payments banks in early 2018 requiring verification of KYC information by third parties.<sup>78</sup>

#### EXAMPLE 3: eIDAS AND eKYC

In the EU, eIDAS is intended to be a starting point for a similar system:

*"[t]he use of electronic identity schemes, as set out in eIDAS, would make it possible to open a bank account on-line while meeting the strong requirements for customer identity proofing and verification... The legal certainty and validity of qualified eSignatures... could also enhance the security of electronic transactions. This should work across borders."<sup>79</sup>*

First steps in that direction have been taken by the European 4th Anti-Money Laundering Directive, which allows electronic identification to be accepted under eIDAS to meet customer due diligence requirements.

## F. SYNTHESIZING THE LESSONS

Technology provides opportunities to reconsider existing systems and build the infrastructure necessary to balance market integrity, financial inclusion and economic growth, while also meeting international financial standards, including the Basel Committee on Banking Supervision, Financial Action Task Force on Money Laundering (FATF), the Financial Stability Board (FSB) and the United Nations Sustainable Development Goals.

In this context, digital identification - for individuals and legal entities - combined with eKYC systems provides the basis for better outcomes from the standpoint of both market integrity and financial inclusion compared to existing approaches. In this context, there is a clear potential solution to many issues surrounding correspondent banking and derisking that have emerged between developed and developing countries banks and customers. Cross-border initiatives based on LEIs have real potential going forward to achieve a range of major objectives in the context of corporates. Likewise, systems of mutual recognition or optional registration have great promise in the context of individuals. Similar synergies are possible in the context of the G20 /OECD CRS - Common Reporting Standard - for automatic exchange of tax information among member jurisdictions.

The G20, FATF and others are increasingly looking at the potential to transform existing AML/CFT, taxation and corruption mechanisms through the application of technology. Design of new systems based upon new technological approaches offers a major opportunity to better protect the financial system from criminal and other uses while at the same time enhancing financial inclusion - the opposite of what we are seeing in many cases today, for instance in the context of derisking and correspondent banking problems. Going forward, the real opportunity is rethink how we approach many of these issues.

At the same time, all these systems, while technically feasible, may not be politically feasible in many countries. In such cases where national identity solutions are not possible, optional digital identity systems that are separate from national/sovereign identification systems have the greatest potential to be transformative. The EU eIDAS Directive is one such framework, and systems developed by Alibaba and Tencent in China represent other possible approaches.

## PILLAR II: ENABLING USE: DIGITAL PAYMENTS INFRASTRUCTURE AND OPEN ELECTRONIC PAYMENT SYSTEMS

Payment systems provide the basic infrastructure for money to flow through any economy, and are therefore vital to financial inclusion, economic development and the functioning of the real economy. In many developing countries, inefficient traditional payment systems have frequently been a major barrier to economic activity generally.

Inefficient systems of moving money and making payments combined with lack of access to that system are core barriers to financial inclusion as well as to economic growth. Reflecting this, efforts have been going on for several decades to build better payment systems, particularly electronic payment systems, connecting disparate parties of countries. Important successes have been achieved in many places but as of the beginning of the 21st century, it was still the case that moving money around many developing countries and making payments were major daily challenges and barriers to development. At the same time, large value payment systems in particular are potential sources of system risk, as well as major supporting financial infrastructures. As a result there has also been significant effort over several decades to build more resilient systems, particularly RTGS (real time gross settlement) systems and relating policy and regulatory frameworks, including as part of the World Bank/IMF Financial Sector Assessment process (FSAP) and post 2008 global regulatory reform efforts.

Into this context have come first mobile money and more recently FinTech.

### A. MOBILE MONEY

Mobile money enables individuals to use their mobile phone to pay bills, remit funds, deposit cash, make withdrawals and save using e-money, sometimes issued by banks but most often by telecommunications companies ('telcos'). As of 2017, mobile money services were operating in 90 developing countries and continue to grow.<sup>80</sup> While terminology tends to vary across countries and the research literature, e-money is typically defined as a type of stored value instrument or product that: (i) is issued on receipt of funds; (ii) consists of electronically recorded value stored on a device such as a mobile phone; (iii) may be accepted as a means of payment by parties other than the issuer; and (iv) is convertible back into cash.<sup>81</sup>

Today, more than 10 years since inception, M-Pesa is a major success, providing financial services to a sizable

proportion of Kenya's population.<sup>82</sup> Other mobile money success stories can be found in Ghana, Uganda, the Philippines and other countries, but this success has not been consistent worldwide. Why mobile money services have taken off in some countries and not others does not have a simple answer. In part, it is because of different consumer needs in different countries, the inability of service providers to adapt their offerings to other markets,<sup>83</sup> different regulatory approaches across jurisdictions,<sup>84</sup> a lack of trained payments professionals in many markets,<sup>85</sup> and challenges with payments interoperability between different network providers when no one network has a dominant market share, as well as interoperability between mobile money and bank accounts. Other aspects of why cash remains king in so many developing countries relate to issues around cash-in/cash-out networks with limited use cases for e-money payment options, as well matters cultural and anthropological.

Mobile money services, including those offered by telcos, are a key part of the solution to financial exclusion. They also pose significant regulatory and supervisory challenges to consumer protection while simultaneously addressing risks to financial integrity and stability. Regulation must be proportionate and not overly burdensome relative to the level of risk.

Mobile money services are typically not as profitable as banking and do not usually introduce systemic stability concerns. As these services grow, they cannot afford – and do not require – the level of regulation generally applied to traditional banks, such as Basel capital and liquidity requirements. What service providers need is a central bank that is interested in encouraging innovation in digital financial services and understands the needs of customers.

This is a major shift in the role of central banks or financial regulators, from a traditional bank supervision function to enabling innovation among banks, telecommunications firms and payment companies to provide e-money to the unbanked. The magnitude of this shift should not be underestimated, and in recent years it has intensified with the explosion of FinTech startups around the world and the challenges of developing and implementing appropriate policy and regulatory environments – a theme we return to in section V.

A flourishing mobile money digital financial ecosystem is one contribution FinTech has made to financial inclusion in many countries, but new technologies and approaches focused on developing comprehensive digital financial ecosystems are emerging and offer significant promise.

There is, however, a much bigger story to be told: that technology can enable many developing countries to leapfrog extensive networks of traditional brick-and-mortar bank branches and deliver a coherent, seamless financial system entirely digitally and provide even the most vulnerable segments of society, such as the rural poor, women and forcibly displaced persons, with accounts that meet all their financial needs, and give SMEs access to the credit and payment services they need to flourish. China's experience highlights the sorts of transformation that is possible, but also some of the risks and challenges.



## B. ALIPAY AND WeCHAT PAY

In China, Alipay and WeChat Pay, while they are closed systems, demonstrate the power of allowing new market entrants and digitizing traditional payments systems.

Alibaba established Alipay in 2004 as a payment method for its e-commerce business, and today is one of the largest mobile wallet providers in the world, along with PayPal and WeChat Pay.<sup>86</sup> The Yu'e Bao money market fund was integrated with the Alipay mobile wallet in 2013 and provides the opportunity to make small investments.<sup>87</sup> It is now the largest money market fund in the world, having outgrown the leading US funds that have been operating for at least half a century.

WeChat was established as a messaging platform by Tencent in 2011. In 2013, the WeChat Wallet was introduced to allow users to make mobile payments in WeChat social games, and in 2014 to call and pay for taxis through the app. Cash transfers and in-store cashless payments in some chain stores became available later that year.<sup>88</sup> By 2017, 92 percent of respondents to a survey were using mobile payment systems like WeChat Pay for retail payments.<sup>89</sup>

This skyrocketing use prompted the People's Bank of China (PBoC) to subject these mobile wallet services to increased scrutiny and regulation. The PBoC has announced that mobile payment institutions will be required from June 2018 to channel payments through a new centralized clearing house, the China Nets Union Clearing Corporation.<sup>90</sup> This change will give the PBoC more control over all payment channels, rather than users interacting with the payment institutions directly.

The PBoC has also raised the reserve funds ratio for payment platform to 50 percent from 20 percent, effective April 2018, with the ratio to gradually increase to 100 percent over time to further protect consumers.<sup>91</sup> At the same time, to address extensive fraud in transactions using QR codes (generally by replacing legitimate codes with fakes), the PBoC introduced caps on such payments.<sup>92</sup> Payment institutions must now obtain permits to offer barcode payments, a method proving increasingly popular in China.<sup>93</sup>

The experiences of WeChat Pay and Alipay highlight that payments providers should be subject to appropriate proportional regulation, both to address risks and provide a level playing field.

## C. DESIGNING REGULATORY INFRASTRUCTURE FOR AN OPEN ELECTRONIC PAYMENTS SYSTEM

Payment systems have long been a major focus of central banks around the world, and electronic payments and settlement infrastructure, supported by an appropriate policy and regulatory environment, form the core of a modern financial system.<sup>94</sup> The Committee on Payment and Markets Infrastructure (CPMI) of the Bank for International Settlements has coordinated related efforts, with the IMF and World Bank providing important support for individual countries and central banks, including establishment of core international regulatory standards (with IOSCO - the International Organization of Securities Commissions).<sup>95</sup>

More recently, the CPMI has considered issues relating to financial inclusion (with the World Bank)<sup>96</sup> and financial exclusion (in the context of correspondent banking).<sup>97</sup> According to the CPMI, new technologies and providers are improving efficiency and access to cross-border retail payments, with clearing and settlement infrastructure and appropriate regulatory and policy frameworks unlocking the greatest benefit.<sup>98</sup> Meanwhile, new technology is also transforming the nature of retail and other payments at the domestic level, in particular with "faster payments systems"<sup>99</sup> and technologies such as distributed ledger technology, including blockchain.<sup>100</sup>

Based on experiences with both traditional and new forms of payment, growing attention is being placed on the design of infrastructure and the policy and regulatory frameworks for such systems, including by AFI, its members and other participants.<sup>101</sup> This includes a comprehensive set of principles for the design of national retail payments systems to support financial inclusion.<sup>102</sup>

Traditional large value and retail payment systems emerged out of a particular combination of institutional, technological, financial and historical factors, primarily in the 19th century. By the late 20th century, technological changes allowed incremental evolution of many of these systems, particularly with the advent of electronic payments, the ATM (automated teller machine) and large value RTGS systems. This combination brought new risks and consequent regulatory and policy responses but also fundamentally transformed the relationship of people - particularly in the developed world - with money and payment.

By the beginning of the 20th century however many of these benefits were largely confined to more developed urban areas in many developing countries and emerging markets. The entry of mobile money on the basis of the feature phone was thus transformation in a number of cases, particularly in Kenya and East Africa, challenges regulatory and policy frameworks but also dramatically enhancing financial inclusion and improving the lives of millions of people.

Looking forward, the greatest challenge and potentially the greatest opportunity going forward is the emergence of new technologies - particularly the smart phone, data analytics, cloud systems and potentially distributed ledger technology and the Internet of Things (IoT). These new technologies have the potential to not only transform access to payments as has already happened in China and is rapidly happening in India and an increasing range of countries around the world, they also have the potential for the redesign of existing 19th century bank-based payment paradigms. The question will be how we best deal with this process of technological transformation from a policy and regulatory standpoint.

The combination of digital ID/e-KYC with open electronic payments provides crucial infrastructure to support a wide range of transactions, including e-commerce and service payments. However, the greatest potential transformation can be achieved when combined with Pillar III.

## PILLAR III: SCALING USE - DIGITIZATION OF GOVERNMENT PAYMENTS AND PROVISION OF SERVICES

Pillars I and II provide the foundation for access to financial services and for a digital financial system. Digital identification and simplified account opening under Pillar I form the basis for financial access as well as mechanisms for addressing concerns around market integrity in the context of the vast majority of the population. Digital payment infrastructure and a policy and regulatory framework for an open access electronic payments system facilitates transactions and payments. Combined, Pillars I and II support a wide range of applications and have the potential to rapidly scale up access to the financial sector and the use of payment mechanisms.

However, experiences in some jurisdictions have shown that Pillar I and Pillar II are not sufficient in themselves to dramatically increase access. Rather, people need applications that they find useful or necessary and which Pillar I and Pillar II make work better than before.

Perhaps the best example of how this can be supported through policy is the digitization of government payments, service provision and related services, especially utilities payments (whether state-owned or controlled). Since government is generally one of the largest employers in any economy, beginning with simple electronic payments (via Pillar II) of government salaries into bank accounts (via Pillar I) can be a very effective way of kick-starting the transformation of digital finance. This can then be extended to the electronic provision of government transfer payments (such as pensions and various forms of income support) to bank accounts. This will typically need to be combined with some sort of strategy to encourage or require accounts for all citizens.

Perhaps the strongest application is the payment of utilities, taxes and other forms of government payments. These are the sorts of applications that begin to change people's lives in important ways by reducing the stresses of queuing at a bank and other transaction costs, as well as potentially increasing receipts.

While many governments have experimented with electronic provision of services, and a growing number are experimenting with a range of mandatory account approaches, these tend to have limited effectiveness unless combined with Pillar I and Pillar II infrastructure.

### PILLAR I-II-III INFRASTRUCTURE

CAN ALSO SUPPORT NATIONAL PENSION SYSTEMS, WHICH CAN NOT ONLY STRENGTHEN THE SOCIAL SAFETY NET, BUT ALSO PROVIDE ADDITIONAL FINANCIAL RESOURCES TO SUPPORT THE ECONOMY



19 G2P PROGRAMS ARE OPERATING IN DEVELOPING COUNTRIES



ONLY 53% OF TRANSACTIONS IN A PAKISTANI G2P PROGRAM FOR WOMEN WERE INITIATED BY WOMEN; THE REST WERE INITIATED BY MALE REPRESENTATIVES. IN RESPONSE, THE PAKISTAN GOVERNMENT ADOPTED BIOMETRIC TECHNOLOGY TO ENSURE WOMEN RECEIVED THE CASH DIRECTLY



This combination has intensified the impact of the third element of the India Stack strategy, which provides government salaries and services electronically through bank accounts. A similar approach has been taken by the UN in Jordan where benefits to refugees are transferred electronically to bank accounts (established on the basis of biometric digital identification) via the existing national payment system and delivered via iris scan-equipped ATM machines.

Such systems not only support financial inclusion, empowerment and savings, but also have the potential to dramatically reduce leakage if designed appropriately. Over time, these systems have the potential to improve tax collection as SMEs grow within the formal financial system. In addition to simple savings, the Pillar I-II-III infrastructure can also support national pension systems, which can not only strengthen the social safety net, but also provide additional financial resources to support the economy.

#### A. ELECTRONIC PAYMENTS: GOVERNMENT SALARIES AND TRANSFERS

For the poor in many countries, state or state-backed support payments are very important. Financial inclusion policies focusing on government payments to the poor have two beneficial outcomes. First, digital payments enable governments to shift from in-kind assistance (food, water supply), which come with significant delivery and accountability issues, to inexpensive cash transfers. Such payments reduce administrative costs, better control leakage and increase transparency and accountability.<sup>103</sup>

Second, accounts used for support payments, once established, are available to be used for non-government payments initiated by the receivers. Once the unbanked gain access to digital financial services through government support payments, they can learn to trust and deal in electronic payments instead of cash. In time, government payments made electronically can undermine the custom in which cash is king.

There are many notable examples of government-to-person (G2P) payment programs aimed at financially including the unbanked. At least 19 G2P programs are operating in developing countries.<sup>104</sup> Among the most prominent examples is probably the Bolsa Familia card program in Brazil established in 2003, which as of 2014, covered around 13.8 million families and a quarter of Brazil's population.<sup>105</sup>

However, most of these projects are not fully digital. For instance, in the case of Bolsa Familia in Brazil, Familias in Colombia and the Benazir program in Pakistan, a debit card is provided to recipients who withdraw cash with the card and spend it on additional transactions. Further digitization of these projects faces real challenges, however. According to CGAP:

*“31 percent of accounts in low-income countries and globally seem to be ‘mailbox’ accounts used for only one or two withdrawals per month. Similarly, CGAP research in India found that 99 percent of the accounts opened for G2P disbursements were showing only one monthly transaction – a withdrawal of the total amount of the benefit transfer.”<sup>106</sup>*

CGAP has also examined the reasons for this outcome, which range from:

*“use limitations of the account itself, insufficient recipient and agent training on using the accounts, negative and risky experiences by recipients trying to access and use these accounts, to the missing value proposition to intermediaries which translates into low quality products and customer service.”<sup>107</sup>*

The Center for Financial Inclusion highlights the need for payment processes to “align with customer life patterns.”<sup>108</sup> For instance, in a Pakistani G2P program for women, a mere 53 percent of transactions were initiated by women; the rest were initiated by male representatives, some of whom were not even of the age required under Pakistan law.<sup>109</sup> In response, the Pakistan government adopted biometric technology to ensure women received the cash directly, hopefully empowering them to decide how to spend the money.<sup>110</sup>

## B. FINTECH AND THE DESIGN OF G2P SYSTEMS

Looking at experiences with systems around the world, it is clear that FinTech offers real potential for enhancing impact and at the same time making Pillars I and II useful for large numbers of people, providing the necessary scale on which other products and services can grow.

If properly designed, G2P payments have the potential to advance financial inclusion, but they often do not underpin a flourishing digital financial ecosystem. The three following features need to be addressed in any system:

1. Government-designed account procedures should facilitate general, unrestricted payments and include sufficient options and reserves for that purpose from the outset. For instance, the Kenyan Uduka card issued since February 2017 can be used at government counters, at least four major Kenyan banks, at ATMs and by merchants that accept a major global credit card.<sup>111</sup>
2. For any digital payment program to succeed, the ‘digital-to-real life’ gap must be bridged. When there are few digital transaction partners, individuals will prefer to use cash. This is generally seen as an agent efficiency issue and providers will seek to increase the number and liquidity of agents in a given area by adding incentives (which eventually translate into costs). However, in a fully digital system there are no agents, and if merchants cannot do business without accepting e-money, they will provide the devices to accept e-money with or without incentives, and will find the most efficient means to do so. Therefore, it all starts with e-liquidity on the customer side. Discouraging the exchange of significant amounts<sup>112</sup> of e-money into cash and slowly calibrating the amount depending on the availability and acceptance of G2P systems could be a viable strategy.
3. Functionality must be simple and reduce the need for training.<sup>113</sup> What one learns in receiving government payments must enable the person to make and receive other transfers. For instance, a customized system that provides customers with the account information of their most important, daily-use recipients, such as electricity and phone companies and schools, could facilitate ease of use.

Fundamentally, G2P systems - in appropriately designed - can be used to trigger the flow of money through accounts and electronic payments systems. Once people begin using the digital financial system, that infrastructure can then support a much wider range of services, products and activities - this is exactly the process which we have seen take place in China, particularly in the context of the Alibaba and Tencent ecosystems.

### C. ELECTRONIC PAYMENTS AND PROVISION: OTHER CORE SERVICES

The combination of Pillars I, II and III, in addition to core government services, support a range of service payments (particularly for utilities and telecommunications services) that fundamentally improve the lives of individuals and enhance collection by service providers. The infrastructure for Pillars I, II and III also supports e-commerce, which in turn has significant benefits for SMEs as a growing number of businesses run a large proportion of their activities through e-commerce platforms.

Governments can support digital transformation by highlighting the advantages of e-money, setting limits for cash transactions in the real economy or requiring merchants to offer digital payments at low or no cost to customers. One example is Fiji, where the G2P program has led to greater digital inclusion as with G2P accounts function as saving devices.<sup>114</sup>

From these foundations, Pillar IV focuses on infrastructure and systems for more complex financial products and functions.

### D. LOOKING FORWARD: BRIDGING THE LAST MILE

Looking forward, it is the combination of Pillar I, II and III which offer the greatest potential to bridge the gap to the 1.7 billion people who still lack financial access. Given that 70 percent have access to a mobile phone, appropriately designed strategies emphasising these three pillars have the potential to bring the majority of this group into the formal financial system in the next decade.

At the same time, the 2018 Global Findex also highlighted that - despite all of the progress over the past decade - the gender gap remains a major challenge. In the context of supporting financial inclusion among women, Pillar III systems offer one way forward: design of government provision of services to target delivery of government transfer and payments to women. This will require consideration in the context of designing such systems, as well as in the complementary Pillar I and Pillar II structures. However, digital finance offers the possibility of bringing women into the formal economy in new ways. Once the system (comprising Pillars I, II and III) has been established, it provides the framework to empower individuals of all sorts as well as businesses small and large as well as governments to use it in new and innovative ways.

Nonetheless, the fundamental digital divide remains: those without access to a mobile or smart phone or the internet will not be able to access the fundamental framework of payments, savings and government services. In addition to the digital divide within countries, there is an increasing risk of a digital divide between countries which develop effective strategies and those which do not. Pillars I, II and III offer a framework for such strategies and combined with decreasing costs of mobile and smart phones and increasing access, offers a path to addressing many aspects of financial inclusion and the digital divide going forward.

## PILLAR IV: EXPANDING THE QUALITY AND RANGE OF SERVICES: DESIGNING FINANCIAL MARKET INFRASTRUCTURE AND SYSTEMS

Together, Pillars I, II and III provide the fundamental infrastructure and policy and regulatory environment for digital financial inclusion. However, they also provide the basis for the development of a broader ecosystem of products and services that moves beyond basic financial inclusion and digital efficiencies. Pillar IV focuses on the design of appropriate digital financial market infrastructure and policy and regulatory frameworks that support a wider range of value-added financial services and products, deepening financial access, usage and stability. Pillar IV is thus about the framework, infrastructure and policy and regulatory environment to support broader digital financial transformation.

Pillars I, II and III support additional digital infrastructure to increase the use and quality of financial services, financial stability and market integrity. They are fundamental to identity, access, payment, savings and government transfers and services. Pillar IV allows for the provision of investment opportunities, particularly in the context of debt and equity markets, at a much lower cost. The experiences of China, Kenya and India, among others, highlight how these systems can be used to provide greater access to investment products (particularly government bonds) and support financial sector development more broadly.

We are also seeing, in China and India but also many other countries, how the development of digital financial infrastructure facilitates the entry of innovative new providers. However, new products, services and entrants can introduce regulatory concerns, so regulators must continually seek to understand new technologies to balance potential risks and opportunities.

Together, the four pillars form a package: an ecosystem of digital financial infrastructure in an appropriate policy and regulatory environment supporting financial transformation and economic growth. Pillars I, II and III provide a foundation for Pillar IV, but must also be seen as mutually reinforcing. Examples of Pillar IV transformations include SME finance, insurance and investments.



## A. TRANSFORMING CREDIT PROVISION: FROM COLLATERAL AND MICROFINANCE TO CASH-FLOW

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One of the most exciting areas where we are seeing development is in the context of credit for SMEs.

Credit provision has traditionally suffered from problems of information asymmetry, with banks specializing in credit risk analysis – a costly process that makes it commercially unviable to assess many individuals and SMEs. This approach relies heavily on collateral as a cheaper alternative to managing and analyzing credit risk, but collateral is often not available in developing countries where property rights and other institutional frameworks may be weak or nonexistent.

The traditional response to this challenge is to create credit bureaus that aggregate credit data and in turn reduce overall costs (in terms of default losses) for the industry.<sup>115</sup>

Digitization is characterized by disintermediation, particularly for information intermediaries. The provider with the most accurate, detailed and extensive digital information about a customer is in the best position to analyze that information and price credit (and other financial services, such as insurance) to them. Superior, comprehensive customer data may be generated from:

- > software companies aggregating information about users' activities;
- > hardware companies and IoT companies using sensors that continually monitor usage behavior and location;
- > social media services (Facebook, Tencent) and search engines (Google, Baidu) providing insight into social preferences and activities;
- > e-commerce providing insight into consumer preferences and payment history; and
- > telecommunications services providers (for example, Safaricom, Vodafone) providing data on mobile activities.

All of this data is then able to be analysed to identify that which correlates with increased credit-worthiness. Big data is increasingly being used by TechFins<sup>116</sup>- large technology, internet and telecommunications firms entering into financial services - to improve business decisions as these data sets are often of far better quality than those of traditional financial institutions. Big data provides a far better picture, in close to real time, of the real financial position of the business or individual applying for financial services. For example, the TechFin will know whether a certain receipt represents a loan from another source or income from customer sales.

From a financial inclusion perspective, TechFins negate the need for interpersonal relations, common in traditional banking. TechFins can better adjust credit rates to the risk (i.e. the client) and, paradoxically, can 're-personalize' the financial relationship via algorithms.

Data-based finance can be simultaneously more attuned to the real risk profile of an individual (provided the data-based methodology is sound) and more inclusive as it can provide tailored financial services at a much lower cost per client.

Real-world examples include Amazon's lending program to small business sellers and Alipay's consumer loan offerings. Similar approaches are being taken in all countries with a high level of tech penetration, including Kenya (with Safaricom/M-Pesa) and India.

This is one of the most exciting developments: the use of technology to provide cash flow-based lending for individuals and SMEs in a cost-effective and risk-prudent way. Given that substantial research has revealed the major role SMEs play in job creation and economic growth, and that SMEs almost invariably have difficulty accessing finance, this development has the potential to revolutionize access to finance. However, this development requires the necessary foundational support.

## B. ADDING INSURANCE AND INVESTMENTS TO SAVINGS AND CREDIT

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While online payments and lending are at the heart of most financial inclusion strategies, they are not the whole story – the investment sector is also necessary. This is particularly true if payments infrastructure is designed nationally with participants subject to the same systemic risks. For instance, in a case of serious drought not only farmers are affected, but also the financial institutions that serve them.

In developed economies, insurance and investment products make financial customers less dependent on their region and ensure risks are diversified. Both types of financial services are necessary for to a thriving ecosystem. For instance, crop insurance helps farmers recover from droughts, and investment products (i.e. a security or investment fund unit) that are segregated if a financial institution becomes insolvent protect the customer's savings in case of fund bankruptcy.

Digitization could address two major barriers to financial inclusion in these areas: access and transaction costs. A third advantage is that online providers can reduce human bias, a particularly serious issue with long-term investments and pooled money management (e.g. insurance). This has been widely discussed in the context of robo-advisers, but also applies to other types of financial services that rely on long-term cash flow plans. At the same time, an enhanced savings rate can strengthen local capital markets and reduce the need to depend upon volatility-enhancing foreign capital.

From a consumer protection perspective, adding online insurance and investments is both an opportunity and a challenge as financial market risks are exchanged for other types of risk. For instance, exposure to insurance and investments increases the risk of volatility and fraud since the exposure is long term. Insurance and investment therefore require providers that are stable over many years. Another major issue is the complexity of long-term

investments. Interest-based savings do not fare well over long savings cycles but investments come with a higher degree of uncertainty and complexity that can encourage mis-selling and ponzi schemes, as has been seen in even the world's most sophisticated financial markets.

Trust in intermediaries is at the heart of liquid financial markets as investors cannot control the risk of their long-term investments. Many online (micro)insurance<sup>117</sup> and investment schemes<sup>118</sup> have been developed that commit to financial inclusion principles; some are being tested now and others are innovators in the start-up stage.

### C. BUILDING BETTER FINANCIAL INFRASTRUCTURE

Today, cloud, IoT, blockchain and other technologies are being used to design better markets and infrastructure, particularly for payment systems, securities clearing and settlement systems, early stage financing, and trade and agricultural finance. In all of these areas and many more, experiments, proofs of concept, pilots, new businesses and models are all emerging to offer better way of approaching long-standing challenges. Likewise, regulators and policymakers - domestic and international - are increasingly working with industry participants of an ever-wider variety of backgrounds to develop appropriate policy and regulatory approaches to balance opportunities and risks, where possible building systems and financial infrastructures that not only perform better from the standpoint of market participants but also from the standpoint of major regulatory and policy objectives. We have discussed one key example in the context of systems to address market integrity and money laundering. We have the potential to build better systems. It is a matter of deciding whether and how. However, maximising this potential requires the foundation of the first three pillars described earlier.

### D. THE EU EXAMPLE: GDPR, PSD2, MiFID2

European digitalization at the regional level developed bottom up following the financial crisis, starting with extensive reporting requirements, and creating the need for intermediaries and supervisors to digitalize. Kickstarted by the introduction of extensive and purely digital reporting to regulators and the imposition of 'open banking' where incumbent intermediaries must share client data with innovative competitors, Europe's digitalization strategy is multi-dimensional.

As compared to India, the European approach is characterized by a lack of a centralized agenda. Rather, the path was determined by needs such as those of financial regulators to better control systemic risks or of ensuring privacy in a world dominated by data-driven firms.

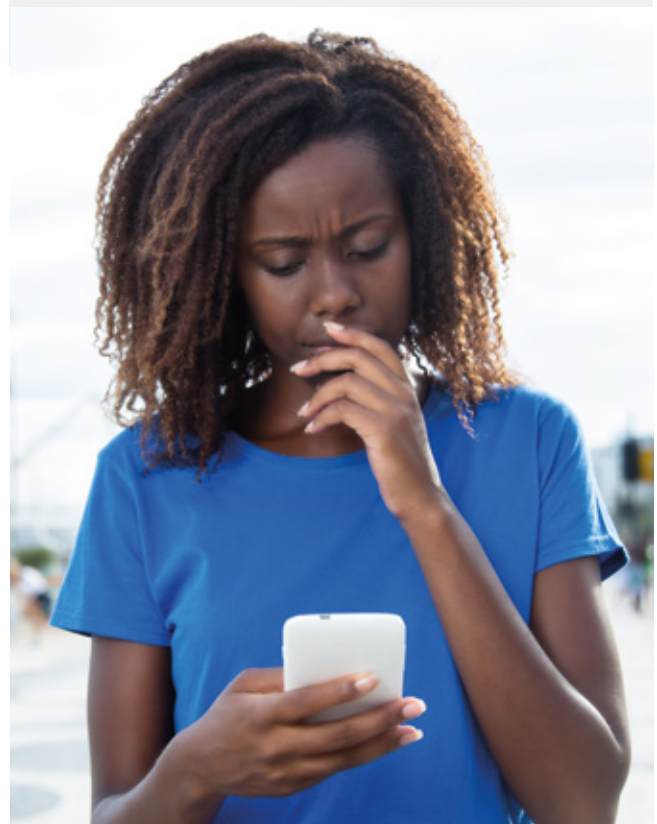
The EU approach highlights that as financial systems digitize, it is necessary to carefully consider approaches not only to financial regulation, but also to competition and data security and protection. In each case, there will need to be a balancing of objectives across the three areas of financial policy, competition policy, and data protection and security policy.

## M-AKIBA KENYA



For instance, Kenyan government bonds can be acquired through mobile accounts that rely on the M-Akiba scheme. M-Akiba enables digital savings in Kenyan government bonds for retail investors, as well as the trading of those bonds. Money raised from the issuance of M-Akiba is earmarked for infrastructure development projects in Kenya with the aim to advance FinTechs.

M-Akiba avoids the investment risks associated with (regional or global) market access, but does not diversify regional-level risks and depends on the involvement of the public sector. This may be a disadvantage if the Kenyan government experiences an economic shock that threatens the ability of the state budget to serve its loans. Regardless, it could function well as a starting point for investors unequipped to deal with more sophisticated financial products.



# DEVELOPING A COMPREHENSIVE STRATEGY

What broader lessons can we draw from experience to date?

## A. STRATEGIC APPROACH

The power of our four pillars approach is greatest when all are pursued and become mutually supporting and reinforcing. To implement this approach, regulators and policymakers need to develop an understanding of the range of technologies impacting the financial sector, and the opportunities and risks they present.

This is a major focus area for AFI, particularly in supporting national financial inclusion strategies,<sup>119</sup> many of which refer specifically to the use of technology to achieve their objectives. The framework presented here may provide guidance to develop those strategies further, especially as they relate to the role of FinTech for financial inclusion.

## B. THE CHALLENGE OF TECHNOLOGY

Any FinTech/RegTech-based approach to financial inclusion must recognize that technology is not perfect and can have unanticipated consequences. For instance, self-learning algorithms may enhance rather than mitigate biases in the data they screen.<sup>120</sup> Until technologies are sufficiently advanced to police the effects of technologies, providers will need to continuously and retroactively test the outcomes of algorithmic interpretation of data.

Second, technology may do exactly what developers anticipate, but the issue may be with the developers themselves. Financial history is replete with fraud and every new technology will be abused by some individuals. Recent examples include the use of virtual currencies for drug trafficking and money laundering,<sup>121</sup> and the use of initial coin offerings to defraud investors/participants.<sup>122</sup>

Third, technology is always accelerating and creating space for groups of new entrants, which makes the role of the regulator ever more challenging. In many cases, this will require regulators to respond using technology. RegTech includes automation and data-driven analysis of internal control systems (compliance, risk management, audit) and internal and external reporting. FinTech also raises broader issues of how to approach the regulation of innovation.

## C. REGULATORY SANDBOXES, PILOTING AND TEST-AND-LEARN APPROACHES

One recent development that has the potential to expand financial inclusion is regulatory sandboxes. A regulatory sandbox is a structured safe harbor for experimentation.<sup>123</sup> At a basic level, the sandbox creates an environment for businesses to test products without having to meet the

full panoply of regulation. In return, regulators require applicants to incorporate appropriate safeguards.<sup>124</sup> There are currently over 20 sandboxes that have been announced or are in operation.<sup>125</sup> Eligibility to enter a sandbox is standardized and publicized, requiring market participants to articulate their added value in a pre-defined format.<sup>126</sup> This is cost effective for participants and resource effective for regulators.

The number of entities in a regulator's sandbox is typically very small, and exemption from regulation is not the most important aspect. For instance, in a pioneering sandbox established by the UK Financial Conduct Authority, there were 18 participants in cohort one and 24 in cohort two.<sup>127</sup> Our research suggests that sandboxes play two far more important roles and both should appeal to developing country regulators.<sup>128</sup>

First, establishing a sandbox sends a strong message to FinTechs that the regulator is open to innovation. Second, it provides an important learning opportunity for regulators, especially when coupled with an 'innovation hub', which is typically a portal through which innovative start-ups can interact with the regulator and seek their advice and bespoke waivers or adjustments of licensing conditions. A sandbox and innovation hub can change traditional dynamics, as the industry comes to see the regulator as an entity they can approach for assistance with regulatory challenges rather than a distant policeman to be avoided. The Australian Securities and Investment Commission (ASIC), in a series of proactive moves, has managed to achieve this cultural shift with a combination of an Innovation Hub, a regulatory sandbox and a Digital Finance Advisory Committee, which meets quarterly and includes representatives from industry, industry associations and all relevant regulatory agencies.<sup>129</sup>

The numbers really highlight the effectiveness of an innovation hub relative to a regulatory sandbox. In ASIC's case, from March 2015 to August 2018, ASIC's innovation hub dealt with 326 entities and provided informal assistance and advice to 287 of those, granted 63 new credit licences and varied 16 existing licences.<sup>130</sup> Compare these figures with the six entities that, in a slightly shorter period, took advantage of ASIC's regulatory sandbox. The experience seems to be that very few potential entrants qualified for the relatively strict sandbox requirements, and that nearly every potential entrant required the more bespoke approach that the hub facilitates. Furthermore, while a hub is admittedly far more demanding of regulatory resources than a sandbox, this demand on regulator time is also a major advantage of a hub, as it facilitates a more interactive two-way knowledge exchange - vital for regulators in this field as it keeps them right at the cutting-edge of developments in the technology.

However, a sandbox alone will not guarantee financial transformation. It will likely provide limited assistance and is most useful when a jurisdiction exhibits the following characteristics:

- > Strong rule of law and transparency;
- > Regulation or time to market is the main barrier to innovation;

- > Risk of corruption is low;
- > The ecosystem advances social business models; and
- > Functional substitutes of the sandbox are not available.

These functional substitutes include balanced reform of financial regulation, such as removal of red tape legislation and an established waiver practice (with transparent reasoning as to why a waiver is granted).

It should be noted that regulators can achieve the most important feature of a sandbox – in-depth discussion with innovative firms – without a sandbox. Experience in Australia and elsewhere suggests an innovation hub, which facilitates knowledge exchange between supervisors and innovative firms,<sup>131</sup> is a more important regulatory innovation. Hubs and sandboxes do not depend on one another.

#### **D. BALANCING FINANCIAL INCLUSION WITH OTHER REGULATORY OBJECTIVES**

Consumer protection is key to digital financial inclusion. One promising option is for regulatory restrictions to be embedded technologically in the product to protect customers from risk. These restrictions would be based on exposure and the ability to bear risks and would substitute for current blanket restrictions on access to financial services.

A reasonable approach never aims for full access to all kinds of financial services for all segments of society. To protect customers adequately and proportionately, any policy must restrict access to products considered too risky for people with low financial literacy, such as certain derivatives, currency trading and those that provide extensive leverage. However, the outcome is always an asymmetric, paternalistic system in which people with higher levels of financial literacy have access to a wider range of financial products.

We envisage that customers will instead be assessed by their income, education, experience and wealth and categorized in classes whereby access to risky products is controlled depending on the class into which they fall. This approach would also align ethical restrictions with customer choices and preferences. For instance, customers that qualify for risky products but want to avoid leverage for religious reasons (e.g. Islamic finance) or because they do not trust themselves to use leverage wisely, would be able to opt out.

In the context of challenges around the digital divide as well as around financial literacy, design of such systems should interact with educational and public awareness systems, in addition to infrastructure and regulatory structures.

The FinTech aspect of this classification is that criteria can be set, reviewed and adjusted automatically on a daily basis, its application can follow data-driven rules and outcomes can be supervised using RegTech.

In fact, central to the design of many system will be

considering how technology may be used to achieve better regulatory outcomes – the core of RegTech. For this to happen, as systems are designed, there is a need not only for balanced and proportionate approaches which consider the possibility of developing better systems through new technologies but also building into these systems regulatory features through digitization of regulatory and compliance processes, allowing better use of datification tools such as machine learning and AI, to provide clearer pictures of the financial system and its participants to regulators and policymakers.

#### **E. DESIGNING REGULATORY SYSTEMS: THE EXAMPLE OF MEXICO**

An increasing number of jurisdictions are developing specific regulatory approaches to FinTech. Given the speed of change, laws and regulations should focus on objectives and principles rather than detailed rules. Mexico provides a very good example of a comprehensive approach focused on general objectives and principles.

Mexico's Financial Technology Law came into effect in March 2018. The Law regulates the registration and operation of non-banks offering access to finance or investment, the issuance of digital money and the exchange of cryptocurrency. The Law also deals with related issues such as crowdfunding, regulatory sandboxes, robo-advisory services and APIs. Several authorities have been given supervisory powers under the Law.

The Law also established the Committee on Financial Technology Institutions to grant authorizations to prospective FinTech institutions, as well as the FinTech Council, an industry advisory body with representatives from both the private and public sector.<sup>132</sup> To participate in the regulatory sandbox, companies may apply for a temporary authorization for up to two years, during which they can trial their services to a small number of customers.<sup>133</sup>

Mexico's law is comprehensive with a balance of regulations that protect consumers, such as supervisory powers and authorization requirements, and promote innovation, such as the regulatory sandbox. Significantly, the approach is based on regulatory principles rather than tied to specific technologies, types of businesses or products.

Looking forward, such principles-based approaches will be key to successful regulatory development. Key however is for regulators and policymakers to understand what is taking place around them: understanding new technologies and trends is necessary in order to approach risks and opportunities in a balanced fashion.



## LOOKING FORWARD

Almost half of the world's unbanked live in seven countries: China, India, Pakistan, Indonesia, Nigeria, Mexico and Bangladesh.<sup>134</sup> Dramatic progress has been made in China and India, and similar strategies for digital financial inclusion have been developed in Indonesia, Mexico, Pakistan and Bangladesh. Many other countries are developing similar strategies to support the transformation offered by digital finance.

The transformation that has occurred in China, is underway in India and is likely to occur in many other developing countries and emerging market economies is creating major new challenges. These include the risk of a permanent digital divide within and between economies, as well as cybersecurity and data protection issues.

A strategy to develop digital financial infrastructure rests on the availability of communications infrastructure and offers the greatest potential in countries with high smartphone penetration rates and inefficient financial systems. While financial inclusion remains a challenge in many countries, the cost of smartphones is falling rapidly and the construction of supporting infrastructure is proceeding apace in most markets, especially in urban and semi-urban areas. The combination of Pillars I, II and III offer tremendous potential to address those with access to a mobile or particularly a smart phone but without financial access. This is the metric where this strategy offers the greatest potential for rapid transformation in the coming decade.

A key risk is the emergence of an insurmountable digital divide between countries that provide the conditions to support smartphone access and develop a strategy for digital financial infrastructure similar to the one in this report, and those that do not or cannot. This is fundamentally an issue of governmental effectiveness and institutional and policy frameworks. Going forward, peer-based organization such as AFI have the potential for significant influence in this respect, as positive examples make their way around the world.

In addition to digital divides emerging between countries, there are also divides within countries that are posing major challenges. For example, financial access often varies greatly between more affluent urban dwellers and poor, rural residents and the elderly. The 2018 Global Findex has also highlighted that the gender gap in financial inclusion has not closed, and AFI has commendably made this a focus under the Denauru Action Plan. In respect of the last mile and in particular gender-based disparities in digital financial inclusion, the combination of Pillars I, II and III offer tremendous potential, particularly in the context of the design of Pillar III systems - an area for future attention going forward.

While the four-pillar strategy outlined in this paper will not solve all financial inclusion challenges, it is designed to address the vast majority of them efficiently, thereby freeing up resources to focus on the remaining ones. With an appropriate framework of digital infrastructure and an enabling policy and regulatory environment, the development of flourishing digital financial ecosystems holds great promise for supporting financial inclusion and economic growth around the world.



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124 For instance, see Hong Kong Monetary Authority (6 September 2016), “FinTech Supervisory Sandbox (FSS)”, 2, available at: <http://www.hkma.gov.hk/media/eng/doc/key-information/guidelines-and-circular/2016/20160906e1.pdf>; see also Monetary Authority of Singapore (16 November 2016), “MAS FinTech Regulatory Sandbox Guidelines”, marginal nos 2.2, 6.2, 6.2.g, available at: <http://www.mas.gov.sg/-/media/Smart%20Financial%20Centre/Sandbox/FinTech%20Regulatory%20Sandbox%20Guidelines.pdf>; see also Bank Negara Malaysia (18 October 2016), “Financial Technology Regulatory Sandbox Framework”, marginal no. 6.1 ff, available at: <http://www.bnm.gov.my/index.php?ch=57&pg=137&ac=533&bb=file>.

125 See BBVA (20 November 2017), “What Is a Regulatory Sandbox”, available at: <https://www.bbva.com/en/what-is-regulatory-sandbox/>. Regulatory sandboxes are currently in operation in Canada, United States of America, Denmark, Ireland, the Netherlands, Switzerland, United Kingdom, Brunei, Hong Kong, Japan, India, Indonesia, Malaysia, Singapore, Thailand, United Arab Emirates, Bahrain, Dubai and Australia. See Industry Sandbox, “Comparing the Industry and Regulatory Sandbox”, available at: <http://industrysandbox.org/regulatory-sandboxes/>.

126 This is particularly so in the leading example of the Financial Conduct Authority in the UK. See D. Zetzsche, R.P. Buckley, D.W. Arner and J.N. Barberis (2017) “Regulating a Revolution: From Regulatory Sandboxes to Smart Regulation”, Fordham Journal of Corporate and Financial Law, 23, pp. 31, 46.

127 Financial Conduct Authority, “About Us”, available at: <https://www.fca.org.uk/about/the-fca> (last visited June 15, 2017).

128 Zetzsche et al., above n 131.

129 See ASIC (last updated 31 January 2018), “Digital Finance Advisory Committee”, available at: <http://asic.gov.au/for-business/your-business/innovation-hub/digital-finance-advisory-committee/>; see ASIC (5 August 2015), “15-21MR Innovation Hub: ASIC Update”, available at: <http://asic.gov.au/about-asic/media-centre/find-a-media-release/2015-releases/15-21mr-innovation-hub-asic-update/>.

130 ASIC’s Innovation Hub, Progress Report, March 2015-August 2018.

131 See Zetzsche et al., above n 131, pp. 38-47 (detailing innovation hub policies in 15 countries).

**LOOKING FORWARD**

132 R. Arce Lozano et al. (2017), “Mexico’s Fintech Law Initiative: What You Need to Know”, available at: <https://www.hoganlovells.com/-/media/hogan-lovells/pdf/debt-capital-markets-global-insights/mexicos-fintech-law-initiative.pdf?la=en>.

133 Ibid.

134 World Bank, above n 13, 35.

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