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Sustainability, FinTech and Financial Inclusion

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Sustainability, FinTech and Financial Inclusion

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Sustainability, FinTech and Financial Inclusion

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We argue FinTech is the key driver for financial inclusion, which underpins sustainable balanced development. The full potential of FinTech to support the Sustainable Development Goals will only be realized with a progressive approach to developing infrastructure to support digital financial transformation. Our research suggests the best way to think about such a strategy is to focus on four primary pillars. The first pillar requires the building of digital identity and simplified account opening and e-KYC systems. This is supported by the second pillar of open interoperable electronic payments systems. The third pillar involves using the infrastructure of the first and second to underpin electronic provision of government services and payments. The fourth pillar – digital financial markets and systems – supports broader access to finance and investment. Implementing the four pillars is a major journey, but one with tremendous potential to transform financial inclusion and sustainable growth.

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I. Introduction

As of 2017, 1.7 billion adults lacked access to a financial or mobile money account, some 31 percent of the world's population.⁴

Significantly, though, between 2010 and 2017, 1.2 billion people gained a financial or mobile money account for the first time, with most located in developing countries.

Much of this progress came from the impact of technology in finance. For example, mobile money has played a major role in increasing financial inclusion in East Africa.⁵ China has moved of late from a traditional financial system to perhaps the world's most digitized financial system.⁶ India has dramatically increased financial access by building the infrastructure for a new digital economy ("India Stack"), thereby leading to about 350 million people gaining accounts. Along with similar developments in Russia, these four places account for the vast majority of the gains in financial inclusion since 2010.

These developments are part of a global phenomenon known as FinTech – financial technology. FinTech is a new term for a long-standing phenomenon – the application of technology to financial services.⁷ This paper examines why FinTech is important for sustainable development and how regulators and governments can design a comprehensive strategy to support digital financial transformation, underpinning financial inclusion and sustainable balanced development.

II. Financial Inclusion and Sustainability: the Long-term Perspective

While financial inclusion is not included specifically in the United Nations Sustainable Development Goals ('UNSDGs'), we suggest that it plays a central role in underpinning the SDGs as well as supporting finance in support of their achievement. This part examines FinTech, its relationship with financial inclusion, and how FinTech for financial inclusion relates to sustainability, the key criterium of the UNSDGs.

⁴ Demircuc-Kunt, Klapper, Singer, Ansar & Hess, *The Global Findex Database 2017: Measuring Financial Inclusion and the Fintech Revolution*, World Bank (Apr. 2018).

⁵ Pasti, *Mobile Money as a Driver of Financial Inclusion in Sub-Saharan Africa*, GSMA (June 7, 2017) <https://www.gsma.com/mobilefordevelopment/programme/mobile-money/mobile-money-driver-financial-inclusion-sub-saharan-africa/>; A. Beyene Fanta et al., *The Role of Mobile Money in Financial Inclusion in the SADC Region* (Policy Research Paper No. 03/2016, FinMark Trust) available at <https://www.finmark.org.za/wp-content/uploads/2016/12/mobile-money-and-financial-inclusion-in-sadc.pdf>.

⁶ Chien, *Key Lessons for Policymakers from China's Financial Inclusion Experience*, World Bank (Feb. 15, 2018) <http://blogs.worldbank.org/psd/key-lessons-policymakers-china-s-financial-inclusion-experience>; see also W. Zhou, D. Arner & R. Buckley, *Regulation of Digital Financial Services in China: Last Mover Advantage* (2015) 8(1) *Tsinghua China Law Review* 25.

⁷ Arner, Barberis and Buckley, 'The Evolution of FinTech: A New Post-Crisis Paradigm?' (2016) 47(4) *Georgetown Journal of International Law* 1271.

A. Financial Inclusion: Why It Matters

Financial inclusion involves delivering financial services at affordable cost to all of society.⁸ It enables people to manage their financial obligations efficiently, reduces poverty and supports wider economic growth.⁹ First, it reduces individuals' vulnerability. For instance, facilitating saving allows people to weather shocks and invest in their education, health and micro-businesses. Second, it increases the efficiency of daily life: bills can be paid electronically without time off work. Third, financial inclusion allows the socialization and diversification of peoples' financial risks through the financial system. For instance, breadwinner insurance can prevent people falling back into poverty. Fourth, financial inclusion supports economic growth through increasing financial resources to support real economic activity, particularly for individuals and small and medium businesses (SMEs).

B. Two Sides of the Same Coin

Financial inclusion is crucial to address today's global challenges as outlined in the UNSDGs. Financial access, particularly through FinTech, is one way to reduce the burden of life's challenges, including sickness, crime, poverty, unemployment, age, etc.¹⁰ Financially excluded individuals lack tools to prepare for and manage such risks. For instance, farmers without access to electronic payment systems worry about theft; and may consume more immediately rather than take the risk. Health insurance can secure one's long-term working capacity. Savings can fund children's educations and provide for old age. These are long-term goals. Financial exclusion takes from people the opportunity to think, plan and *act* long-term. Where risks that could be avoided, hedged, or socialized through the financial system materialize we force the excluded to think and act *short-term*, often unsustainably. Financial inclusion and sustainability are two sides of the same coin, aimed at the UNSDG's core objective: promoting prosperity while balancing risks.

C. FinTech and the UNSDGs

The connection between financial inclusion and the UNSDGs, may lead one to expect to find financial inclusion as a UNSDG. However, neither FinTech nor financial inclusion are objectives in themselves. Rather, both are *tools* to build a sustainable future. Table 1¹¹ presents how FinTech contribute directly or indirectly to the UNSDGs. If financial markets are sufficiently mature, providing payment services, long-term financing, insurance services and savings/investment products, supporting financial inclusion – particularly through FinTech – could contribute to *all* 17 UNSDGs.

⁸ FATF, *FATF Guidance: Anti-Money Laundering and Terrorist Financing Measures and Financial Inclusion* (February 2013) 12.

⁹ Center for Financial Inclusion, *About Financial Inclusion 2020*
<http://www.centerforfinancialinclusion.org/fi2020/about-fi-2020>.

¹⁰ These are listed as key challenges in the United Nations Sustainable Development Goals,
<https://www.un.org/sustainabledevelopment>.

¹¹ The Table draws on the authors' own research and experience. That digital financial services support the UNSDGs is very broadly accepted: see United Nations, *Digital Finance and the SDGs*,
<http://www.uncdf.org/mm4p/dfs-and-the-sdgs>.

Table 1 makes evident that financial inclusion through FinTech is perhaps *the most important* intermediate step economies must take on their journey to the UNSDGs. Economies should develop strategies for digital financial transformation, focusing on FinTech's role in financial inclusion, as a response to the most important and difficult question: How should economies approach achieving the UNSDGs?

Table 1: How FT could further the UNSDGs

No.	Goals	Impact Direct=D Indirect=I	How FT can further goal
1	No poverty	I	Allow for online financing, including credit and crowdfunding; create new income opportunities through online markets and payments; reduce impact of disasters
2	Zero hunger	I	Enhance financial stability; stabilize cash-flows through saving and lending
3	Good health and well-being	I	Provide health insurance and financial stability Enhancing government income and reducing leakages to increase financing available for health
4	Quality education	I	Enable financial planning and saving for school fees Enhancing government income and reducing leakages to increase financing available for education
5	Gender equality	D	Strengthening female entrepreneurship and financial control
6-7	Clean water and sanitation; affordable and clean energy	I	Financing development and maintenance of infrastructure; further education of local sustainability expertise
8	Decent work and economic growth	D	Enable online financing, credit and crowdfunding; new (online) income and business opportunities
9	Industry, Innovation and Infrastructure	D	Provide financing for development and maintenance of infrastructure Enhancing government income and reducing leakages to increase financing available for infrastructure and R&D
10	Reduced inequalities	D	Enable funding of education and savings which provide the best opportunity for greater participation
16	Peace, justice and strong institutions	I	Robust economic development strengthens peace and civil institutions Enhancing government income and reducing leakages to improve governance, institutions and public trust
17	Partnerships	D	FT allows for engagement of private actors, multiplying assistance of public or state-supported actors

For these reasons, an ever-increasing range of international development organizations are focusing on the role of FinTech and digital financial transformation in supporting broader developmental objectives today, including the United Nations Secretary-General's Task Force on Digital Financing of the Sustainable Development Goals¹², the Alliance for Financial Inclusion¹³, the World Bank and Consultative Group to Assist the Poor (CGAP)¹⁴, and many regional development banks.¹⁵

III. Four Pillars of Digital Financial Transformation

Given the many partly competing, partly complementary initiatives it is crucial to avoid the mistakes of the past. This part addresses two questions: what lessons have we learned; and what types of FinTech are most likely to advance balanced sustainable growth and financial inclusion?¹⁶

A. Experiences and Lessons

Financial Inclusion Initiatives since 2008: G20

The 2008 financial crisis prompted sweeping regulatory responses coordinated by the G20 aimed at building a resilient global financial system. This led to the establishment of the Financial Inclusion Experts Group ('FIEG'),¹⁷ Global Partnership for Financial Inclusion ('GPFI') and the endorsement of the first Financial Inclusion Action Plan ('FIAP') by G20 leaders.¹⁸

The GPFI formally recognized digital financial solutions as critical to facilitate global financial inclusion in 2016¹⁹ and introduced the G20 High Level Principles for Digital Financial Inclusion (HLPs).²⁰ Alongside the Recommendations for Responsible Finance²¹ and the ID4D,²² the HLPs aim to encourage and guide governments to embrace digital

¹² See UN Secretary-General's Task Force on Digital Financing of the Sustainable Development Goals, <https://digitalfinancingtaskforce.org/>.

¹³ See, by these authors, AFI, "FinTech for Financial Inclusion: A Framework for Digital Financial Transformation", Sept, 2018; at <https://www.afi-global.org/publications/2844/FinTech-for-Financial-Inclusion-A-Framework-for-Digital-Financial-Transformation>

¹⁴ Worldbank, Fintech and Financial Inclusion, <http://pubdocs.worldbank.org/en/877721478111918039/breakout-DigiFinance-McConaghy-Fintech.pdf>.

¹⁵ We know of FinTech initiatives by the Asian Development Bank, the Islamic Development Bank, the European Investment Bank, and the Financial Development Corporation.

¹⁶ G20 Global Partnership for Financial Inclusion, *Digital Financial Inclusion: Emerging Policy Approaches* (2017) <https://www.gpfi.org/publications/g20-report-digital-financial-inclusion-emerging-policy-approaches>.

¹⁷ G20 Financial Inclusion Experts Group, *Innovative Financial Inclusion* (ATISG Report, 25 May 2010); GPFI, *Principles and Report on Innovative Financial Inclusion* <http://www.gpfi.org/publications/principles-and-report-innovative-financial-inclusion>.

¹⁸ G20, *Financial Inclusion Action Plan* (2010) 3; R. P. Buckley, 'The G20's Performance in Global Financial Regulation' (2014) 37(1) *University of New South Wales Law Journal* 63.

¹⁹ GPFI, *Launch of the G20 Basic Set of Financial Inclusion Indicators* (Apr. 22, 2013) <http://www.gpfi.org/featured/launch-g20-basic-set-financial-inclusion-indicators>.

²⁰ GPFI, above n 19.

²¹ See Responsible Finance Forum, *Best Practices and Recommendations on Financial Consumer Protection* (Apr. 2011) <https://responsiblefinanceforum.org/publications/best-practices-recommendations-financial-consumer-protection/>.

²² See World Bank, *Identification for Development* <http://www.worldbank.org/en/programs/id4d>.

approaches to financial inclusion. In 2017, the FIAP was updated to reflect the pivotal role of digitization.²³

The Alliance for Financial Inclusion (AFI) was established in 2008 by developing country central banks to focus exclusively on financial inclusion. In 2012, its members signed the historic Maya Declaration on Financial Inclusion, by which developing countries committed to financial inclusion targets and national policy changes and other agreements have followed.²⁴

The UN also established the Task Force on Digital Financing in November 2018 in an effort to develop strategies that promote financial technology to advance the SDGs. Recognizing that FinTech for financial inclusion requires nothing less than an overhaul of the entire financial system, the UN's Task Force is committed to "put people at the centre," i.e. it supports the view expressed herein that FinTech is an important, possibly the most important, single accelerator for attainment of the SDGs.²⁵

Increasing financial inclusion is being seen – correctly in our view – not as an end to itself but as one fundamental support for achieving broader sustainable development objectives, including the UNSDGs.

B. FinTech and Financial Inclusion: The Foundation of Digital Financial Transformation

FinTech today encompasses technologies such as the application of artificial intelligence to big data. Which among these innovations are most likely to facilitate financial inclusion and the UNSDGs?

The immediate answer is mobile money – the provision of e-money on mobile phones – of which the paradigmatic example is M-Pesa in Kenya. The longer-term answer is more complex. The real opportunity FinTech affords is developing an entire infrastructure for a digital financial ecosystem underpinning the SDGs and financial development, inclusion, stability and integrity.

Lessons can be taken from India's FinTech strategy, India Stack, implemented over the last decade. India Stack is a set of APIs which form a digital infrastructure used by the government, businesses and other entities to provide paperless and cashless services.²⁶ India Stack involves four main levels.²⁷ First is a national biometric identification system. Second is the establishment of bank accounts to deliver national services. Third is a common payment API. Fourth is a series of electronic KYC initiatives allowing individuals to provide their financial details to financial services and other providers. These eKYC utility platforms show how

²³ Timmermann and Gmehling, *Financial Inclusion and the G20 Agenda* (Paper presented at the International Statistical Institute Regional Statistics Conference, Bali, Mar. 22-24, 2017) https://www.bis.org/ifc/events/ifc_isi_2017/06_timmermann_paper.pdf.

²⁴ AFI, *Maya Declaration* <https://www.afi-global.org/maya-declaration>; AFI, *Maya Declaration Continues to Evolve with Financial Inclusion Commitments from 66 Countries* (Nov. 6, 2017) <https://www.afi-global.org/news/2017/11/maya-declaration-continues-evolve-financial-inclusion-commitments-66-countries/>.

²⁵ United Nations Secretary General, *Task Force on Digital Financing of Sustainable Development Goals* (Statement, 29 Nov 2018) <https://www.un.org/sg/en/content/sg/personnel-appointments/2018-11-29/task-force-digital-financing-sustainable-development/>.

²⁶ *What Is IndiaStack?*, <http://indiastack.org/about/>.

²⁷ Bose, *India's Fintech Revolution is Primed to Put Banks out of Business*, TechCrunch (June 14, 2016) <https://techcrunch.com/2016/06/14/indias-fintech-revolution-is-primed-to-put-banks-out-of-business/>; To learn more about India Stack, see <http://www.indiastack.org/About-India-Stack>.

RegTech – regulatory technology – can improve the integrity of financial markets and reduce risks.

Based on India’s experience and other successful examples including Kenya, China and Russia, we argued in our major study for AFI that economies must focus on four pillars of digital financial infrastructure to support digital financial transformation.²⁸ 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 facilitates the digital flow of funds from 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 support value-added financial services and deepen access, usage and stability.

These four pillars are examined below.

Pillar I: Digital ID and eKYC – Establishing the Foundation

Experience indicates that digital identity is central to the transformation process. This is particular challenging in developing countries where substantial numbers of people often lack formal identification documents.

India’s Aadhaar system is the first level of India Stack and involves issuing a 12-digit randomized number to all residents for access to government and other services.²⁹ Difficulties in implementation should not detract from the potential of a national biometrically-based identification system to underpin a digital financial ecosystem. Digital ID is necessary for subsequent parts of the digital financial ecosystem to rest upon a solid foundation.

The experiences of the UN and Jordan with developing a digital identity solution for refugees illustrates good system design and synergistic development.³⁰ IrisGuard is iris recognition technology that converts an iris image into a unique code which is then used to identify the individual.³¹ Since 2016, IrisGuard’s EyePay platform has been used by the UN to deliver financial aid. The technology provides sufficient digital identity for beneficiaries to receive food vouchers, withdraw cash and transfer funds without a bank account. EyePay, in conjunction with the Ethereum blockchain, is now used to promote financial inclusion of Syrian refugees in Jordan by processing supermarket and ATM transactions in real-time. More than 2.3 million Syrian refugees in the region are registered in the system so far.³²

In the European Union, the 2014 eIDAS Regulation was adopted to provide mutually recognized digital identity for cross-border interactions between European citizens, companies and government institutions. Once member states notify the European

²⁸ AFI: “FinTech for Financial Inclusion: A Framework for Digital Financial Transformation”, Sep. 2018, available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3245287

²⁹ *About Aadhaar*, Unique Identification Authority of India, <http://bit.ly/2HsyJd>.

³⁰ See <https://www.irisguard.com/node/39>.

³¹ *Ibid.*

³² *Ibid.*

Commission of their eID, other member states must recognize it and individuals can use their eID in other member states.³³

Base digital ID needs to extend as broadly as possible to maximize efficiencies. While base identity can be developed from multiple sources, including business-specific e-identities,³⁴ base identity provides the fundamental element of the KYC process. Particularly when linked electronically with other golden source data (such as tax information), it provides the basis of a simple eKYC system. The core objective is to make opening accounts for most people and entities simple and cheap, thereby allowing resources to be focused on higher risk customers and protection of market integrity.

Technology enables the reconsideration of existing systems so as to balance market integrity, financial inclusion and economic growth while meeting international financial standards.

For instance, as part of its Aadhaar system, India has developed a paperless eKYC service, to instantly establish the identity of prospective customers.³⁵ The digitization of identity authentication streamlines account opening and allows easy access to both digital and traditional financial services. Axis Bank was the first Indian bank to offer an eKYC facility in 2013, reducing the turnaround time for opening bank accounts from 7-10 days to just one day.³⁶ Today, many traditional banks and licensed payments banks in India offer accounts which can be opened and used instantly with eKYC.³⁷

The European eIDAS system is intended to be the starting point for a similar system, making it ‘possible to open a bank account on-line while meeting the strong requirements for customer identity’.³⁸ This includes accepting electronic identification for meeting CDD requirements.

A. Synthesizing the Lessons

Such systems – while technically feasible – may not be politically feasible everywhere. Systems of optional digital identity, separate from sovereign identification systems, may hold the greatest transformative potential.³⁹

Pillar II: Open, Interoperable Electronic Payment Systems – Building Connectivity

Payments systems provide the fundamental infrastructure for money to flow through any economy. They are foundational to financial inclusion, financial development and the functioning of the real economy. A mobile money ecosystem is one way FinTech can help. Technology enables developing countries to leapfrog bricks-and-mortar bank branches with a

³³ Arner, Zetsche, Buckley & Barberis, *The Identity Challenge in Finance: From Analogue Identity to Digitized Identification to Digital KYC Utilities*, <https://ssrn.com/abstract=3224115>, at 4.3.

³⁴ Ibid, at 4.4.2.

³⁵ Desai and Jasuja, *India Stack: The Bedrock of a Digital India*, Medium (Oct. 27, 2016) <https://medium.com/wharton-fintech/the-bedrock-of-a-digital-india-3e96240b3718>.

³⁶ *Axis Bank Introduces a Paperless eKYC Based A/c Opening*, India Infoline News Service, https://www.indiainfoline.com/article/news/axis-5875391291_1.html.

³⁷ For example, AXIS Bank (https://www.axisbank.com/accounts/savings-account/axis-asap/axis_ASAP.html) and RBL Bank (<https://abacus.rblbank.com/>).

³⁸ European Commission, *Consumer Financial Services Action Plan: Better Products, More Choice*, (March 2017) 13-14, https://ec.europa.eu/info/publications/consumer-financial-services-action-plan_en.

³⁹ Arner, et al, *supra* n 33 at 4.4.2.

seamless digital financial system. Even poorer members of society can then have accounts and SMEs access the services they need to flourish.

A. Mobile Money

Mobile money enables mobile phones to be used to pay bills, remit funds, deposit cash, make withdrawals and save, using e-money, sometimes issued by banks but mostly by telecommunication companies ('telcos'). The service currently exists in over 89 developing countries and is growing rapidly.⁴⁰ E-money is typically defined as a 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.⁴¹

M-Pesa is a major success providing financial services to a sizable proportion of the Kenyan population.⁴² However, mobile money success has not been consistent. This is due to the differing needs of consumers in different countries, the inability of service providers to adapt to different markets,⁴³ a tendency of central banks to over-regulate these services,⁴⁴ a lack of trained payments professionals in many markets,⁴⁵ and cultural and anthropological reasons.

Mobile money services, especially those offered by telcos, are key in defeating financial exclusion in poorer countries, but pose real regulatory challenges. Such services do not initially pose systemic stability concerns and cannot afford, nor require, traditional levels of banking regulation. Furthermore, service providers benefit from a central bank that encourages innovation and understands local customer needs: a major shift from the traditional role of central banks.

B. Designing Regulatory Infrastructure for an Open Electronic Payments System

In China, Alipay and WeChat Pay show the power of facilitating new entrants and the digitization of the traditional payments system among banks.

Alibaba established Alipay in 2004 as a payment method for its ecommerce business. It is now the second largest mobile wallet provider in the world, behind PayPal.⁴⁶ The Yu'e Bao

⁴⁰ GSMA, *State of the Industry 2014 - Mobile Financial Services for the Unbanked* (March 2015) https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2015/03/SOTIR_2014.pdf.

⁴¹ Mobile Financial Services Working Group, *Mobile Financial Services: Basic Terminology*, Alliance for Financial Inclusion (Aug. 1, 2014) <http://www.afi-global.org/library/publications/mobile-financial-services-basic-terminology-2013>.

⁴² In 2016, through embracing M-Pesa and other digital payment networks, over 75% of adults in Kenya had access to formal financial services, a 26.7% increase from a decade earlier, N. Ndung'u, *M-Pesa - A Success Story of Digital Financial Inclusion*; <https://www.geg.ox.ac.uk/sites/geg/files/M-Pesa%20-%20a%20success%20story%20of%20digital%20financial%20inclusion%20-%20Njuguna%20Ndung%E2%80%99u.pdf>.

⁴³ Buckley and Webster, 'FinTech in Developing Countries: Charting New Customer Journeys' (2016) 44 *Journal of Financial Transformation* 151.

⁴⁴ For example, the Central Bank of Kenya applied a "light-touch" approach from the outset, which many believe assisted the provision of these services.

⁴⁵ Buckley and Mas, 'Coming of Age of Digital Payments as a Field of Expertise' (2016) Vol 2016(1) *Journal of Law, Technology & Policy* 71.

⁴⁶ Bushell-Embling, *Alipay Is World's Second Largest Mobile Wallet*, ComputerWorld Hong Kong (Apr. 9, 2018) <https://www.cw.com.hk/digital-transformation/alipay-world-s-second-largest-mobile-wallet>.

money market fund was established with Alipay in 2013, providing the opportunity to make small investments, and is now the world's largest money market fund.⁴⁷

WeChat was established as a messaging platform by Tencent in 2011. In 2013, the WeChat Wallet was introduced, allowing users to make mobile payments in WeChat games. Cash transfers and in-store cashless payments became possible in 2014,⁴⁸ and by 2017, 92 percent of survey respondents were using mobile payment systems like this for retail payments.⁴⁹

The People's Bank of China ('PBoC') has since 2017 subjected these mobile wallet services to increasing regulation. Mobile payment institutions are now required to channel payments through a new centralized clearing house, the China Nets Union Clearing Corporation.⁵⁰ The PBoC has also raised payment platforms' reserve funds ratio to 50 percent from 20 percent, gradually increasing to 100 percent over time, to further protect consumers.⁵¹ Payment institutions must now also obtain permits to offer barcode payments.⁵²

These Chinese experiences highlight how payments providers should be subject to appropriate proportional regulation to address risks and provide a level playing field.

Increasingly, interoperability to bring together traditional and new forms of payments are central to making such systems attractive. As such, governments are increasingly mandating interoperability as a licensing condition for payments providers; in many cases, governments are even involved in the development of switches to provide the supporting infrastructure for such interoperability across different systems.

The combination of digital ID/eKYC with open electronic payments provides the fundamental infrastructure. The greatest digital transformation can be achieved by combining these with Pillar III.

Pillar III: Electronic Government Provision of Services – Expanding Usage

While various governments have experimented with electronic provision of services and mandatory account approaches, their effect is often limited unless built upon Pillar I and II infrastructure. This combination has underpinned the third element of India Stack, namely providing government salaries and services electronically through bank accounts.

Such systems support financial inclusion, empowerment and savings and may also dramatically reduce leakage, facilitating and supporting all aspects of achieving the UNSDGs. Such systems have the potential to improve tax collection, as SMEs grow within the formal financial system instead of outside. The Pillar I-II-III infrastructure can also

⁴⁷ Mu, Yu'ebao: *A Brief History of the Chinese Internet Financing Upstart*, Forbes (May 18, 2014) <https://www.forbes.com/sites/ericximu/2014/05/18/yuebao-a-brief-history-of-the-chinese-internet-financing-upstart/#25c898583c0e>.

⁴⁸ Millward, *7 Years of WeChat*, Tech In Asia (Jan. 21, 2018) <https://www.techinasia.com/history-of-wechat>.

⁴⁹ China Tech Insights, *WeChat User & Business Ecosystem Report 2017* (2017) <https://technode.com/2017/04/24/wechat-user-business-ecosystem-report-2017/>.

⁵⁰ Hong, *How China's Central Bank Is Clamping Down on the Mobile Payment Industry*, Forbes (Aug. 18, 2017) <https://www.forbes.com/sites/jinshanhong/2017/08/18/how-chinas-central-bank-is-clamping-down-on-the-mobile-payment-industry/#5fa0a13b50be>.

⁵¹ Wang, *China Tightens Regulations over Mobile Payment Apps – What's Next for Tencent and Ant Financial?*, Forbes (Jan. 3, 2018) <https://www.forbes.com/sites/ywang/2018/01/03/china-tightens-regulation-over-mobile-payment-apps-whats-next-for-tencent-and-ant-financial/#47e526ae7f1d>.

⁵² Xinhua, *China Looks for Right Balance between Financial Innovation, Risk*, China Daily (Dec. 30, 2017) <http://www.chinadaily.com.cn/a/201712/30/WS5a46fd55a31008cf16da4599.html>.

support national pension systems, which enhance the financial safety net and provide additional financial resources to support growth.

A. Electronic Payment: Government Salaries and Transfers

For the poor, state support payments are often important. Digital financial transformation policies focused on government payments – particularly to the poor – achieve three beneficial outcomes. First, digital payments enable governments to shift from in-kind assistance (food, water supply) to inexpensive cash transfers.⁵³ Second, accounts established for support payments can be used for non-government payments. Third, the need to use the technology to receive government payments can break down cultural attachment to cash.

There are many notable examples of Government-to-Person (“G2P”) payment programmes aiming at financially including the unbanked as well as enhancing the efficiency and effectiveness of government services, transfers and payments. At least 19 G2P programmes operate in developing countries.⁵⁴ However, most of these projects are at best half-digital. In the case of *Bolsa Familia* in Brazil, *Familias* in Colombia, and *Benazir* in Pakistan, a debit card is provided to recipients who may withdraw cash. However, further digitalizing these projects faces real challenges. According to CGAP, ‘31 percent of accounts in low-income countries... [are] used for only one or two withdrawals per month.’⁵⁵ CGAP has identified potential reasons for this, including use limitations of accounts and insufficient recipient and agent training.⁵⁶

The Center for Financial Inclusion highlights the need for payment processes to ‘align with customer life patterns.’⁵⁷ For instance, in a Pakistani G2P women’s programme, only 53% of transactions were initiated by women; the rest were by male representatives.⁵⁸ Consequently, the Pakistan government adopted biometric technology, ensuring women received cash transfers directly, thereby hopefully empowering them to decide how to use the money.⁵⁹

G2P payments can further financial inclusion and the UNSDGs, *if properly designed*. However, G2P payments frequently have not successfully underpinned a flourishing digital financial ecosystem. In particular, the three following features must be addressed:

1. Government-designed account procedures should facilitate later unrestricted payments.
2. The digital-to-real gap must be bridged well. When digital transaction partners are few, individuals will prefer cash. If merchants cannot do business without accepting e-money, they will provide devices to accept e-money efficiently, with or without incentives. Hence, it all starts with e-liquidity on the customers’ side.
3. Functionality must be simple. The learning required to receive government support must enable one to make and receive other transfers. A customized set-up could

⁵³ CGAP, *Govt. to Person Payments*, <http://www.cgap.org/topics/gov-person-payments>; G. Stewart, *Government to Person Transfers - On-Ramp to Financial Inclusion?* (2016) https://www.centerforfinancialinclusion.org/storage/documents/Government_to_Person_Transfers.pdf.

⁵⁴ Stewart, id, 29 (citing policy reports from PFIP, CGAP, Gates Foundation and others).

⁵⁵ CGAP, above n 533.

⁵⁶ Ibid.

⁵⁷ Stewart, above n 543, 2.

⁵⁸ Id at 19.

⁵⁹ Government of Pakistan/BISP, *Women Empowerment: Status and Challenges* (2017) 12, <http://bisp.gov.pk/wp-content/uploads/2017/05/BISP-Women-empower-forum-24-05-2017-latest.pdf>.

assist, for instance by providing customers with the account information of their most important recipients.

B. Electronic Payment and Provision: Other Core Services

The combination of Pillars I, II and III supports many service payments, particularly for utilities and telecommunications, that improve the lives of individuals. The infrastructure for Pillars I, II and III also supports ecommerce, with significant benefits for SMEs.

Governments can support digital transformation by highlighting the advantages of e-money, setting limits for cash transactions in the real economy, and requiring merchants to accept digital payments at low or no cost to customers.

More transformational, integrated strategies integrating Pillars I, II and III have the potential to transform government revenue, delivery of services, and trust and confidence. This combination is very powerful from the standpoint of supporting the achievement of the UNSDGs.

From the mutually reinforcing foundations of Pillars I-III, Pillar IV focuses on other forms of infrastructure to support access to finance more broadly.

Pillar IV: Design of Financial Market Infrastructure and Systems – Enabling New Activities, Business and Wider Development

Additional forms of digital financial infrastructure, combined with the foundations of Pillars I-III can support access to finance, financial stability and market integrity. Digitized systems for securities trading, clearing and settlement can also provide greater access to investment products and support financial sector development more broadly, as evidenced through the experiences of China, Kenya and India, among others.

A. Transforming Credit Provision: From Collateral and Microfinance to Cash-flow

Historically, credit risk analysis was conducted only by specialized banks, making it uncommercial for many individuals and SMEs. The traditional solution was to rely on collateral, which is difficult in developing countries where property rights may be weak or nonexistent.

Digitalization has changed this. Providers with accurate customer data are well placed to price credit through datafication, i.e. the process of analyzing and using data. Superior data may derive from social media services, search engines, e-commerce platforms, and telcos.⁶⁰

The big data approach applied by these firms (referred to as ‘TechFins’) should improve business decisions by helping form a better picture of a customer’s financial position using these superior data sets.

TechFins can thus **‘re-personalize’ the financial relationship** with clients by adjusting credit rates based on individuals’ real risk profiles. This enables financial inclusion by providing ‘personalized’ services at a much lower cost per client.

The potential benefits are huge but the emergence of such platforms also brings new challenges and risks, some existential from the standpoint of the UNSDGs, meaning

⁶⁰ Zetzsche, Buckley, Arner and Barberis, ‘From FinTech to TechFin: The Regulatory Challenges of Data-Driven Finance’ (2018) 14 *New York University Journal of Law and Business* 101 (2018).

approaches to the interaction between data regulation and financial regulation must be considered carefully.

B. Adding Insurance and Investments to Savings and Credit

While online payments and lending are the core of most financial inclusion strategies, extensions into the investment sector are necessary. Digitalization can increase access and reduce transaction costs. It also may reduce biases in investments and strengthen capital markets through enhanced savings rates. Importantly, it also has the potential to bring new financial resources into the financial system which can in turn support innovation, business development, human capital and infrastructure, as savings rates increase and are redirected through the financial system, thereby underpinning attainment of the UNSDGs.

However, digitalization also brings risks. The main challenge is the uncertainty and complexity which are inherent in investments. Bridging the trust divide – as investors must trust intermediaries to control risk – is at the heart of developing liquid financial markets.

C. Building Better Financial Infrastructure

Today, cloud, IoT, blockchain and other technologies are being used to redesign markets and infrastructure, particularly in payment systems, securities clearing and settlement systems, early stage financing, and trade and agricultural finance. Maximizing this potential requires the foundation of Pillars I-III.

IV. Developing a Comprehensive Strategy

A. Strategic Approach

The starting point is that the power of these pillars is greatest when all are pursued and become mutually reinforcing. This is the core lesson from India Stack and can be seen in an increasing range of countries which are pursuing integrated strategies to support financial inclusion and digital financial transformation.

B. The Challenge of Technology

Any FinTech-based approach must accept that technology is not perfect. Three consequences follow.

First, technology may operate beyond its developers' intentions. Self-learning algorithms may enhance biases existing in the data.⁶¹ Perfect technologies to control this tendency do not yet exist. Hence, providers must constantly test the outcomes of algorithmic data interpretation.

Second, technology may do exactly what the developers intend, and the problem is the developers. Financial history is replete with fraud. Every new technology will be abused by some. A recent example is the use of initial coin offerings for defrauding investors/participants.⁶²

Third, ever-accelerating technology facilitates ever more new entrants, making regulators' roles ever more challenging. This will likely require regulators to respond with

⁶¹ See e.g. Uber's use of machine learning: H. Reese, *How Data and Machine Learning Are 'Part of Uber's DNA'*, TechRepublic (Oct. 21, 2016) <https://www.techrepublic.com/article/how-data-and-machine-learning-are-part-of-ubers-dna/>.

⁶² Zetzsche, Buckley and Arner, 'The ICO Gold Rush', forthcoming *Harvard Int'l Law Journal*, available at <https://www.ssrn.com/abstract=3072298>.

technology. RegTech includes automation and data-driven analysis of internal control systems and internal and external reporting.

C. Building Innovation Ecosystems: Regulatory Sandboxes, Piloting and Test-and-Learn Approaches

One recent development to potentially assist digital financial transformation is regulatory sandboxes.⁶³ The sandbox creates an environment for businesses to test products without having to meet the full panoply of regulation. In return, regulators require appropriate safeguards.

The main advantages of sandboxes extend beyond the regulator's exemption. A sandbox sends a market message that the regulator is open to innovation and provides learning opportunities for regulators. The main risks of sandboxes are the potential to jeopardise regulatory priorities and supervisory 'over-friendliness' due to corruption.

Probably most important is the need for policymakers and regulators to develop methods to understand new technologies and the related risks and opportunities combined with the increasing necessity for regulators to consider they can better use technology redesigning their systems for the regulation of digital finance and FinTech. This use of technology by regulators is the truly transformative potential of RegTech and integrated systems design of the sort we advocate.

D. Balancing Inclusion with Other Regulatory Objectives

Client protection is key for not only digital financial inclusion but digital financial transformation more broadly. One promising option is regulation-by-design: regulatory restrictions embedded technologically in the product. These restrictions would reflect client exposure and ability to bear risks and would substitute for today's restrictions on access to financial services.

A reasonable approach will never aim at full access for all of society to all financial services. To protect clients, any policy must be partially exclusive: restricting access to products too risky for people with low financial literacy. The result will be an asymmetric paternalistic system in which people with greater financial sophistication have access to wider ranges of financial products. We envisage that clients will be assessed by income, education, experience and wealth and categorized in classes. Depending on the class, access to risky products will be controlled. This approach also allows preferred ethical restrictions. For instance, clients who wish to avoid leverage for religious reasons (e.g. Islamic finance) will be able to do so.

The FinTech aspect of this new legal, rather than de facto segregation, is that criteria can be set, reviewed and adjusted day-to-day, as its application follows data-driven rules, and its outcome can be supervised using RegTech.

E. Designing Regulatory Systems: The Example of Mexico

Mexico's Financial Technology Law came into effect in March 2018 and regulates the registration and operation of non-banks offering access to finance or investment, digital money and cryptocurrencies. The Law also deals with issues such as crowdfunding, regulatory sandboxes, robo-advisory services and APIs. Numerous authorities were given supervisory powers, and the Committee on Financial Technology Institutions was established

⁶³ Zetsche, Buckley, Arner & Barberis, "Regulating a Revolution: From Regulatory Sandboxes to Smart Regulation", (2017) (1) *Fordham Jnl of Corp & Fin'al Law* 31-103.

to grant authorizations to prospective institutions.⁶⁴ Mexico's sandbox allows companies to apply for temporary authorization for up to two years to trial their services.

Mexico's law takes a principles-based approach, rather than one tied to specific technologies, business forms or product types. Going forward, such principles-based, rather than rules-based, approaches are key to successful regulatory development.

V. Towards Inclusive and Balanced Sustainable Growth

Digital financial transformation is *one* important answer to how regulators and government can support achievement of the UNSDGs. Digital financial transformation supports achievement of the UNSDGs in three key ways: first, by potentially generating additional financial resources; second, by more efficiently using existing (as well as new) financial resources; and third in some cases by directly supporting achievement. A comprehensive digital financial transformation strategy based on four pillars, including digital ID, open interoperable payment systems, FinTech for G2P programmes, and long-term development of sophisticated financial market infrastructure, is key.

This strategy of digital financial infrastructure development rests fundamentally on availability of communications' infrastructure. It offers the greatest potential in countries with high smart phone penetration rates and inefficient old-fashioned financial systems. While financial inclusion remains a challenge in many countries, the cost of smart phones is falling rapidly, while construction of related infrastructure is proceeding apace in most markets. While this strategy will not solve all challenges – for instance, we may face a new digital divide between the technologically able and others – it does provide the core elements of an enabling framework to support the achievement of the UNSDGs.

⁶⁴ Arce Lozano et al, *Mexico's Fintech Law Initiative: What You Need to Know*, Hogan Lovells (2017) <https://www.hoganlovells.com/~media/hogan-lovells/pdf/debt-capital-markets-global-insights/mexicos-fintech-law-initiative.pdf?la=en>.



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