

The Digital Financial Services Primer

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ABSTRACT²

Digital Financial Services (DFS) is a relatively new, low-cost means of digital access to transactional financial services. Often termed ‘mobile money’ or ‘mobile financial services,’ DFS is one of the core solutions used in developing countries to catalyze financial inclusion and provide much-needed low-cost access to financial services.

Aimed at those at the Bottom of the Pyramid (BOP) in developing countries, it shifts provision of financial services it uses digital access devices such as mobile phones and digital value transfer channels. It also features the emergence of agent networks for cash-handling and DFS account signups.

DFS can be offered banks and non-banks – known as Digital Financial Service Providers (DFSPs) - who may be licensed or authorized by a range of regulators to provide these services, either on their own or in mandated partnerships. Core DFS regulators include the central bank, the financial intelligence unit and the national telecommunications authority. ‘Enabling and proportional’ regulatory regimes allow DFSPs to collect customer funds through agents operating on their behalf, convert those funds into electronic money (e-money) to be stored in customer stored value accounts (SVAs) that are used for primarily transactional purposes.

While DFS has demonstrated novel responses and innovations from regulators and lawmakers to facilitate and supervise new market participants, often the regulatory innovations have been incremental or perfunctory, featuring some interesting carve-outs that often represent the local political economy, for example requiring formation of specific financial entity vehicles to provide DFS.

Initial, foundational services include remittance and bill payments, but with limited interoperability between competing providers. There are signs however of a more integrated approach, where DFSPs integrate into a national payment system and the broader economy, while central banks themselves are building interoperable switches to catalyze this integration. Governments are increasing digital liquidity in DFS and hence driving DFS use by placing social payments into DFS SVAs. New forms of vendor platforms also facilitate these improvements.

While some 690 million people in 91 countries actively use their DFS accounts, handicapping a more rapid evolution and adoption of DFS are strict anti-money laundering (AML) rules; poor identity document regimes in many countries that stifle account signups; and poor mobile coverage and lack of high speed mobile data coverage in rural areas that forces DFS customers there to use insecure and error prone text-based DFS user interfaces on their phones. All these factors appears to be the cause of a drop in account usage in some countries in favor of a dependency on agent-derived over-the-counter transactions. There is also a downstream effect on competition and the commercial viability of some DFSPs. This brief primer on DFS expands on these issues and demonstrates how technological, regulatory and commercial components interact to form the DFS ecosystem.³

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³ Much of the background and foundational data in this primer is drawn *inter alia* from Perlman, L (2003) *Mobile Commerce*, Payments Conference, Cape Town, South Africa; Perlman, L (2010) *Mobile Money*, Mobile Money Conference at Columbia Business School; and Perlman, L (2012) *LLD Thesis: Legal and Regulatory Aspects of Mobile financial Services*, available at <https://bit.ly/2KGfC8k>

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ABBREVIATIONS

2G	Second Generation Mobile
3G	Third Generation Mobile
4G	Fourth Generation Mobile
AFR	Access to Finance Rwanda
AML	Anti-Money Laundering
ATM	Automated Teller Machine
BIS	Bank for International Settlements
BMGF	Bill and Melinda Gates Foundation
BOP	Bottom of the Pyramid
BOT	Bank of Tanzania
BOU	Bank of Uganda
BTCA	Better Than Cash Alliance
CB	Central Bank
CDD	Customer Due Diligence
CDR	Call Data Record
CGAP	Consultative Group to Assist the Poor
CICO	Cash-in, Cash-out
CIV	Customer Identification and Verification
CPMI	Committee on Payment Market Infrastructure
DCB	Direct Carrier Billing
DFID	Department for International Development
DFS	Digital Financial Services
DFSP	Digital Financial Services Provider
eID	Electronic Identification Document
eKYC	Electronic Know Your Customer
e-money	Electronic Money
EMI	Electronic Money Issuer
FATF	Financial Action Task Force
FRAND	Fair, Reasonable and Non-Discriminatory
G20	Group of Twenty
G2P	Government To Person
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GPFI	Global Partnership for Financial Inclusion
GPRS	General Packet Radio Services
GSM	Global System for Mobile Communications
GSMA	GSM Association
ID	Identity
IFC	International Finance Corporation
IMF	International Monetary Fund
ITU	International Telecommunications Union
ITU FG DFS	International Telecommunications Union Focus Group on Digital Financial Services
IVR	Interactive Voice Response
KYC	Know Your Customer
LONO	Letter of No Objection
MEFMI	Macroeconomic & Financial Management Institute of Eastern & Southern Africa
MFS	Mobile Financial Services
ML	Money Laundering
MMS	Multimedia Messaging Service
MNO	Mobile Network Operator

MOU	Memorandum of Understanding
NTA	National Telecommunications Authority
OTC	Over the Counter
P2P	Person to Person
PAFI	Payment Aspects of Financial Inclusion
PSP	Payment Service Provider
QOS	Quality of Service
RBA	Risk Based Approach
SIM	Subscriber Identity Module
SMP	Significant Market Power
SMS	Short Message Service
SOV	Store of Value
SRA	Sector Regulatory Authorities
SSB	Standard Setting Body
STK	SIM Toolkit
SVA	Stored Value Account
TF	Terrorism Financing
TSP	Technical Service Provider
UCC	Uganda Communications Commission
UI	User Interface
UN	United Nations
UNCDF	United Nations Capital Development Fund
UNSGSA	United Nations Secretary General's Special Advocate
USAID	United States Agency for International Development
USSD	Unstructured Supplementary Service Data
UX	User Experience
VAS	Value Added Services
WAP	Wireless Access Protocol
WASP	Wireless Application Service Provider

1 Introduction

Digital Financial Services (DFS) is a relatively new,⁴ low-cost means of digital access to transactional financial services.⁵

Aimed at those at the Bottom of the Pyramid (BOP)⁶ in developing and emerging countries⁷ and with an aspirational goal of improving financial inclusion, it shifts provision of financial services from primarily banks to non-banks, with the core access to services using a mobile phone.⁸

With its increasing ubiquity and expansion of basic mobile coverage across emerging and developing countries, new technologies and innovations in vendor platforms have facilitated the use of the mobile phone to evolve from a basic telecommunications utility of calls and messages to that of a new enhanced role as a payment and person-to-person (P2P) transfer instrument.

The most proximate means then to facilitate formal financial inclusion and thus access to formal services is through development of a DFS ecosystem that can provide ubiquitous and low cost national access to Digital Financial Service Providers (DFSPs) and banks primarily through the use of low-cost mobile phones operating off mobile networks.

⁴ While DFS is a relatively new term, its scope includes even an early implementation of a mobile phone-centric transactional financial ecosystem was launched in 2001 in the Philippines. It was initially called ‘mobile banking,’ later ‘mobile money,’ then ‘mobile financial services,’ and leading to the contemporaneous term DFS.

⁵ See **Exhibit 3** below on sample of conceptions of DFS through the lens of industry observers, regulators and participants.

⁶ The term BOP was introduced sometime in 1999 by Prahalad and Hart to describe what they observed were ‘Four Consumer Tiers.’ At the very top of the world economic pyramid, they said were 75 to 100 million affluent Tier 1 consumers from around the world, comprising a cosmopolitan group of middle- and upper-income people in developed countries and the few rich elites from the developing world. In the middle of the pyramid, in Tiers 2 and 3, are poor customers in developed nations and the rising middle classes in developing countries, the targets of past emerging-market strategies. Tier 4, they indicated, were the 4 billion people at the bottom of the pyramid who had an annual per capita income — based on purchasing power parity in US dollars — is less than USD 1,500, the minimum considered necessary to sustain a decent life. For well over a billion people — roughly one-sixth of humanity — per capita income is less than USD 1 per day. See Prahalad, C & Hart, S (1999) *Strategies for the Bottom of the Pyramid: Creating Sustainable Development*, available at <https://bit.ly/2OdTYsV>. For an analysis of the BOP concept years later with revised figures, see Kolk, A, Rivera-Santos, M & Rufin, C (2012) *Reviewing a Decade of Research on the 'Base/Bottom of the Pyramid' (BOP) Concept*, available at <https://ssrn.com/abstract=2193938>

⁷ In this paper, the DFSO follows the UNDP classification of developed and developing countries for the most part. It uses the Human Development Index (HDI) to classify countries. HDI is a composite index of three indices that measure longevity, education and income in a country to classify countries. Developed countries are countries in the top quartile of the HDI distribution and developing countries are countries in the bottom three quartiles. The term developing countries is however being used loosely in this paper. In the DFSO’s research of developing countries, we also included countries that may not necessarily be in the lower three quartiles of the HDI distribution but have high financial exclusion and can benefit from the use of DFS, for example Brazil and Russia. Nielsen, L (2011) *Classification of Countries Based on their Level of Development*, available at <https://bit.ly/2JEg4n7>; and UNDP (2018) *Human Development Index*, available at <http://hdr.undp.org/en/content/human-development-index-hdi>

⁸ The moniker ‘mobile money’ and ‘mobile financial services’ often refers to some or all of evolving DFS components. Mobile money is the term used by the GSM Association (GSMA) to describe all mobile phone-based financial transactions. See GSMA (2018) *2017 State of the Industry Report on Mobile Money*, available at <https://bit.ly/2IvPZ94>

‘Financial Inclusion’ is often defined as the provision and use of formal accounts operated by regulated entities that cater to those at the BOP.⁹ With payments being the connective tissue of a financial system,¹⁰ not having access to an account makes personal liquidity management and payments for even basic services very difficult. Financial inclusion aims also to lower account costs, allow for greater proximity to financial intermediaries, enforce stronger legal rights, facilitate better management of financial risk¹¹ and drive development through access to more capital - thus reducing poverty.

There is a clear recognition¹² that financial stability in an economy and financial inclusion go hand in hand because they represent two sides of the same coin. It can also lead to more politically stable environments.¹³ Similarly, at a pure macro level, financial inclusion attracts greater participation by different segments of the economy to the formal financial system particularly by improving the process of intermediation between savings and investments. As a result, the Group of Twenty (G20),¹⁴ the World Bank,¹⁵ the International Monetary Fund (IMF),¹⁶ and a number of United Nations (UN) agencies¹⁷ have all made financial inclusion a priority. In particular, the World Bank’s ‘Findex’ global survey of adult financial use is a pivotal tool in measuring progress towards financial inclusion.¹⁸ Many countries have developed long-term national financial inclusion strategies to execute on an inclusive vision.¹⁹

Exhibit 1: The Nature of Financial Inclusion

⁹ Franklin, A, Demirguc-Kunt, A, Klapper, L *et al.* (2016) *The Foundations Of Financial Inclusion: Understanding Ownership And Use Of Formal Accounts*, available at <https://bit.ly/2LTBLRr>

¹⁰ BMGF (2018) *Level 1*, available at <https://leveloneproject.org/>

¹¹ World Bank Group (2018) *The Global Findex Database 2017*, available at <https://globalfindex.worldbank.org/>

¹² Neaime, S & Gaysset, I (2016) *Financial Exclusion and Stability in MENA: Evidence from Poverty and Inequality*, available at <https://bit.ly/2LXmleW>

¹³ Franklin, A, Demirguc-Kunt, A, Klapper, L *et al.* (2016) *The Foundations Of Financial Inclusion: Understanding Ownership And Use Of Formal Accounts*, available at <https://bit.ly/2LTBLRr>

¹⁴ The G20’s Global Partnership for Financial Inclusion (GPII) for example is an inclusive platform for all G20 countries, interested non-G20 countries and relevant stakeholders to carry forward work on financial inclusion, including implementation of the G20 Financial Inclusion Action Plan. The G20 has issued High-Level Principles (HLPs) for Digital Financial Inclusion. See GPII (2017) *New G20 High-Level Principles for Digital Financial Inclusion*, available at <https://bit.ly/2yCCfGe>

¹⁵ The World Bank Group and the Committee on Payments and Market Infrastructures (CPMI) of the Bank for International Settlements’ (BIS) Payment Aspects of Financial Inclusion (PAFI) initiatives supports the World Bank’s Universal Financial Access (UFA2020) program aimed at ensuring that all working-age individuals and businesses have access to at least one transaction account operated by an authorized and/or regulated payment service provider to perform most, if not all, of their payment needs; safely store some value; serve as a gateway to other financial services. See WB-CPMI (2016) *PAFI*, available at <https://bit.ly/2s4rYP8> ; World Bank (2017) *UFA2020 Overview: Universal Financial Access by 2020*, available at <https://bit.ly/1szzaBL>

¹⁶ IMF (2018) *IMF Releases the 2018 Financial Access Survey*, available at <https://bit.ly/2AoLKKv>.

¹⁷ There is also the UN Secretary General’s Special Advocate (UNSGSA) for Inclusive Finance for Development. See <https://www.unsgsa.org>. And, Her Majesty Queen Máxima of the Netherlands, who has served as the UN Secretary-General’s Special Advocate for Inclusive Finance for Development since 2009. See UNSGSA (2013) *Queen Máxima as the UNSGSA*, available at <https://bit.ly/2OY9U7K>; UNSGSA (2018) *Financial Inclusion*, available at <https://bit.ly/2qfOcNI>; and also the UN’s ‘Better Than Cash Alliance’ efforts at digitization of developing world financial access systems. <https://www.betterthancash.org/>

¹⁸ World Bank Group (2018) *The Global Findex Database 2017*, available at <https://globalfindex.worldbank.org/>

¹⁹ See World Bank (2018) *National Financial Inclusion Strategies Resource Center*, available at <https://bit.ly/2D2ur4l>

The need for alternative means of access to financial services in many parts of the developing world has its genesis in the needs,²⁰ challenges²¹ and constraints²² of predominantly cash-based economies using informal means of financial access that do not involve bank accounts.²³ Those without access to financial products are also variously referred to as being ‘unbanked,’ ‘unserved’ or ‘underserved.’²⁴

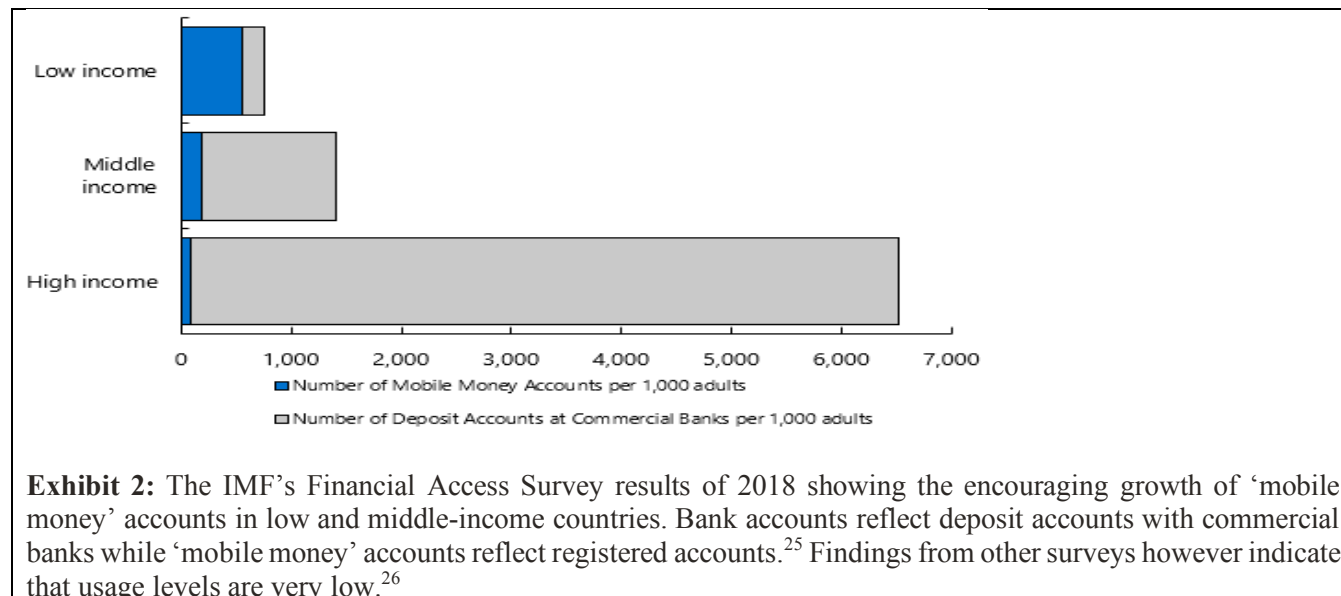


Exhibit 2: The IMF’s Financial Access Survey results of 2018 showing the encouraging growth of ‘mobile money’ accounts in low and middle-income countries. Bank accounts reflect deposit accounts with commercial banks while ‘mobile money’ accounts reflect registered accounts.²⁵ Findings from other surveys however indicate that usage levels are very low.²⁶

DFS often fills a gap left by banks who have been unable or unwilling to service those at the BOP, and features non-banks now providing the financially excluded with an alternative to reliance on cash as a means of payment and transfer. The success of this transition is evident recent IMF data in **Exhibit 2** which shows that DFS use has

²⁰ For example, low-cost and proximate access to basic financial services.

²¹ For example, lack of an ID for DFS onboarding and usage purposes; affordability of access mechanisms such as even feature phones; slow, unreliable or even non-existent mobile coverage; financial and technical illiteracy; and often significant gender biases that preclude women from having direct access to financial services and even identity documents. For a recent gender perspective on regulatory enablers for DFS, see Bin-Humam, Y; Izaguirre, J-C; & Hernandez, E (2018) *Regulatory Enablers for Digital Finance: A Gender Perspective*, available at <https://bit.ly/2PV4SFz>

²² Differences may include often system-wide lack of ID documents and financial history for Customer Identification and Verification (CIV) and Anti-Money Laundering purposes; use of a feature phones for access to accounts rather than (bank) branches or full web-based interfaces; technological capabilities and financial literacy of users; use of human agents rather than bank branches; and the entry and proliferation of non-bank providers. See also Evans, O (2016) *Determinants of Financial Inclusion in Africa: A Dynamic Panel Data Approach*, available at <https://bit.ly/2sEiD0V>

²³ Since banks have traditionally been the front-line for the provision of financial services such as savings accounts and for remittances, the financially excluded have also been referred to as being unbanked, unserved and underserved. Sahay, R, Čihák, M, N’Diaye, P, et al. (2015) *Rethinking Financial Deepening: Stability and Growth in Emerging Markets*, available at <https://bit.ly/1K4Gb3d>

²⁴ For a discussion of these terms, see Lyman, T & Kate Lauer (2015) *What is Digital Financial Inclusion and Why Does it Matter?*, available at <https://bit.ly/1GX1xdJ>; and Evans, O (2016) *Determinants of Financial Inclusion in Africa: A Dynamic Panel Data Approach*, available at <https://bit.ly/2sEiD0V>; and Sahay, R, Čihák, M, N’Diaye, P, et al. (2015) *Rethinking Financial Deepening: Stability and Growth in Emerging Markets*, available at <https://bit.ly/1K4Gb3d>

²⁵ IMF (2018) *IMF Releases the 2018 Financial Access Survey*, available at <https://bit.ly/2AoLKKv>. Data is from the Survey and IMF staff calculations and covers 2017 or the most recent 5-year period for reporting countries

²⁶ See **Section 3.2.3** on DFS activity levels; and GSMA (2018) *2017 State of the Industry Report on Mobile Money*, available at <https://bit.ly/2IvPZ94>

grown to outgrow bank accounts in many developing and emerging economies.²⁷ Findings from other surveys however indicate that usage levels are very low.²⁸ ‘Findex’ survey data from the World Bank²⁹ indicates that some 515 million adults opened new accounts in the last three years.³⁰

The need for new financial access solutions has also manifested in new regulatory regimes, with the emergence of what has become known as ‘enabling and proportional’ regulatory regimes that allow non-banks to enter a market under a relaxed regulatory regime to collect customer funds through agents operating on behalf of non-banks,³¹ house these funds in ring-fenced accounts and ‘convert’ those funds into electronic money (e-money) to be stored in customer stored value accounts (SVAs) for use for primarily transactional purposes.³²

This study assumes some very basic knowledge of mobile technologies and payments and this primer will provide deeper insight into how the DFS ecosystem has evolved, how it operates, and its challenges.

And similarly, for DFS practitioners, it will provide a refresh of the issues that still permeate the DFS environment, including enabling laws and regulations, regulatory coordination, commercial models, technological challenges, and interoperability between DFS systems.

For deeper insight into many of the issues raised in this primer, we encourage reading of companion papers authored or coauthored by the author, including on the DFS/mobile financial services (MFS) scheme;³³ DFS technologies;³⁴ mobile coverage;³⁵ regulatory technology³⁶ (regtech),³⁷ regulatory sandboxes;³⁸ competition;³⁹ coordination

²⁷ The IMF’s Financial Access Survey results of 2018 showing the encouraging growth of ‘mobile money’ accounts in low and middle-income countries. Bank accounts reflect deposit accounts with commercial banks while ‘mobile money’ accounts reflect registered accounts. IMF (2018) *IMF Releases the 2018 Financial Access Survey*, available at <https://bit.ly/2AoLKKv>. Data is from the Survey and IMF staff calculations and covers 2017 or the most recent 5-year period for reporting countries

²⁸ See **Section 3.2.3** on DFS activity levels; and GSMA (2018) *2017 State of the Industry Report on Mobile Money*, available at <https://bit.ly/2IvPZ94>

²⁹ World Bank Group (2018) *The Global Findex Database 2017*, available at <https://globalfindex.worldbank.org/>

³⁰ As noted by the UNSGSA, the power of the Findex lies in the details—the kind of details policymakers, financial sector providers, and development organizations need to measure progress, understand impact, and plan for the future. See UNSGSA (2018) *Financial Inclusion*, available at <https://bit.ly/2qfOcNI>

³¹ In some cases where risk is considered higher because of high potential transaction values, regulatory enablement of agents is required for agents for banks, rather than for non-bank DFSPs. This is often known as ‘agent banking.’

³² Their transaction activity may include person-to-person payments, some merchant payments, receipt of social welfare (G2P) payments; and increasing use of payments for e-government services. Credit provision by non-bank DFSPs is not ubiquitous, and is often disallowed by regulators in a DFS context. On services, see McKinsey & Company (2018) *Mobile money in emerging markets: The business case for financial inclusion*, available at <https://mck.co/2qcWvtt>

³³ Perlman, L (2012) *LLD Thesis: Legal and Regulatory Aspects of Mobile Financial Services*, available at <https://bit.ly/2KGfC8k>

³⁴ Perlman, L (2017a) *Technology evolution and innovation in DFS*, available <https://bit.ly/2CEufm>; and Perlman, L (2017b) *Technology Inequality: Opportunities And Challenges For Mobile Financial Services*, available at <https://bit.ly/2r7nzny>

³⁵ Perlman, L & Wechsler, M (2018) *The Role of Mobile Coverage on Digital Financial Services*, available at www.dfsobservatory.com

³⁶ Emerging ‘regtech’ solutions using automated regulatory tools such as artificial intelligence (AI) to replace manual processes are designed to assist regulators in coordinating extended remits caused by the complexity of DFS. See **Exhibit 7** on ‘regtech’ and in more detail.

³⁷ Perlman, L & Gurung, N (2018a) *Use of Regtech by Central Banks and its Impact on Financial Inclusion*, available at www.dfsobservatory.com

³⁸ Wechsler, M; Perlman, L & Gurung, N (2018) *The State of Regulatory Sandboxes in Developing Countries*, available at www.dfsobservatory.com

³⁹ Perlman, L (2017c) *Competition Aspects of Digital Financial Services*, available at <https://bit.ly/2xxLcma>

between regulators;⁴⁰ in humanitarian crises responses;⁴¹ on the role of the national telecommunications authority in DFS;⁴² the role of the central bank in DFS;⁴³ on the role of the competition authority in DFS;⁴⁴ and on de-risking.⁴⁵

2 The Evolving DFS Ecosystem

2.1 Overview

As noted in the introduction, financial inclusion⁴⁶ is the aspirational goal of national governments, supra-national bodies and philanthropists to facilitate and promote the provision and use of formal accounts operated by regulated entities that cater to those at the BOP⁴⁷ in many markets. ‘Financial inclusion’ is often defined as the provision and use of formal accounts operated by regulated entities that cater to those at the BOP.⁴⁸ There are however variations: ‘Digital Financial Inclusion’ is said to be the enabling component for financial inclusion, described by Consultative Group to Assist the Poor (CGAP) as ‘digital access to, and the use of, formal financial services by the excluded and underserved population.’⁴⁹

The goal is to migrate the excluded at the BOP away from cash⁵⁰ and paper-based payment instruments towards an integrated ‘formal’ digital financial ecosystem that facilitates sustainable, seamless and low-cost transactions. Some country-specific ‘National Financial Inclusion Strategies’⁵¹ include in these goals as a broader suite of financial services to enable customers to pay, save, borrow, insure against risk, manage their financial life. In many cases these are coincident.

The first iteration in this transformation were what was known as ‘walled garden’ micro-payment systems for digital value added services – and now known as Direct Carrier Billing (DCB)⁵² – where prepaid mobile airtime value

⁴⁰ Perlman, L (2018) *Model MOU Between a Central Bank and National Telecommunications Authority For Digital Financial Services Regulation*, available at www.dfsobservatory.com

⁴¹ Gurung, N & Perlman, L (2018b) *The Role of Digital Financial Services in Humanitarian Crises Responses*, available at www.dfsobservatory.com

⁴² Perlman, L (2018a) *The Role of the National Telecommunications Authority in DFS*, available at www.dfsobservatory.com

⁴³ Perlman, L (2018b) *The Role of the Central Bank in DFS*, available at www.dfsobservatory.com

⁴⁴ Perlman, L (2018c) *The Role of Regulators in Competition-Related Matters in Digital Financial Services*, available at www.dfsobservatory.com

⁴⁵ Perlman, L & Wechsler, M (2019, forthcoming) *Derisking and Its Impact on Financial Inclusion (draft title)*, available at www.dfsobservatory.com

⁴⁶ Financial Inclusion where there is a ‘digital’ component to it – that is using inter alia DFS - also known to some as digital financial inclusion.

⁴⁷ Franklin, A, Demirguc-Kunt, A, Klapper, L, et al. (2016) *The Foundations Of Financial Inclusion: Understanding Ownership And Use Of Formal Accounts*, available at <https://bit.ly/2LTBLRr>

⁴⁸ *ibid*

⁴⁹ For a discussion of these terms, see Lyman, T & Kate Lauer (2015) *What is Digital Financial Inclusion and Why Does it Matter?*, available at <https://bit.ly/1GX1xdJ>

⁵⁰ Cash transactions present financial and personal risks for those unbanked, since individuals have no recourse if the funds are stolen. Gross, M, Hogarth, J & Schmeiser, M (2012) *Use Of Financial Services By The Unbanked And Underbanked And The Potential For Mobile Financial Services Adoption*, available at <https://bit.ly/2Ld5NOF>

⁵¹ See the collection of Strategies curated by the World Bank. World Bank (2018) *National Financial Inclusion Strategies Resource Center*, available at <https://goo.gl/xSgFsG>

⁵² The original mobile wallet SVA was based on prepaid mobile prepaid airtime, first used in the mid-1990s. Use thereof for non-telecommunications activity is highly restricted though by the NTA and/or CB because of systemic concerns. For example, the airtime SVA could only be used for purchase of digital goods such as music and - unlike a DFS SVA – the airtime wallet could not be redeemed for cash. Some intra-mobile network airtime value transfer are allowed, and some Russian MNOs are allowing limited cash-out at their own stores. For an analysis of the evolution of the mobile airtime SVA to its DCB incarnation, and its metamorphosis in some markets to ‘mobile money’ (as DFS), see Perlman, L (2017a) *Technology evolution and innovation in DFS*, available <https://bit.ly/2CEufm>; Perlman, L (2012) *LLD Thesis: Legal and Regulatory Aspects of Mobile Financial Services*, available at <https://bit.ly/2KGfC8k>

stored in a mobile network operators (MNOs) customer's prepaid airtime SVA was used to purchase digital value added services (VAS) such as music. The SVA value was non-redeemable and access and use was controlled by MNOs, with the VAS provided by what were known as Wireless Application Service Providers (WASPs). This DCB-ecosystem soon evolved to more general purpose digital financial ecosystem now generally known as DFS, and operated by non-banks and banks. Third parties providing DFS are called DFS Providers (DFSPs).

Core to this nexus between mobile phones and access to financial services is that while 1.7 billion adults do not have a (formal) account with a financial institution, more than 1 billion⁵³ of them have a mobile⁵⁴ phone and are within the coverage area – sometimes only low-speed 'second generation' (2G) mobile coverage⁵⁵ - of a MNO. Similarly, while around 230 million 'unbanked' adults work for businesses and get paid in cash, 78% of them own a mobile phone.⁵⁶ This to a degree also refers to those who received remittances or are recipients of government-to-person (G2P) payments.

The early 2000s saw the emergence of the first iterations of low-cost financial and transactional methods that allowed mobile phones to be used as general purpose payment instruments using value stored in a customer electronic wallet – known as a SVA – provided and operated by non-banks.⁵⁷

The first service to recognize the potential of this phone-finance nexus was 'Smart Money,' launched in 2001 in the Philippines by MNO Smart Communications. The launch, however, of Safaricom Kenya's M-PESA system in 2007, is seen by many as igniting global initiatives towards ubiquitous financial access provision and introducing the term 'mobile money'⁵⁸ into the developmental lexicon as a financial service with a redeemable SVA provided by an MNO.⁵⁹

2.2 The DFS Scheme

As this mobile-based financial ecosystem has evolved, so too has the terminology: it has been known as 'mobile money' and 'mobile financial services' but is now more formally known as DFS. Providers of DFS are known as DFSPs.⁶⁰

⁵³ Gallup (2018) *Global Findex: Technology Can Bridge Financial Inclusion Gap*, available at <https://bit.ly/2IhCoVE>

⁵⁴ The phones primarily use Global System for Mobile Communications (GSM) technology, a phone standard developed in the 1980s by the European Telecommunications Standards Institute to describe the protocols for second-generation (2G) digital cellular networks used by mobile phones. Originally Groupe Spécial Mobile, the first GSM implementation was in Finland in 1991 on a network built by Telenokia and Siemens and operated by Radiolinja. These digital technologies have since evolved to include second generation (2G) mobile technologies such as Unstructured Supplementary Service Data (USSD), Short Message Service (SMS) and various low data speed capabilities. Together, these technologies constitute the enabling infrastructure for DFS. The first SMS message was sent in 1992; while Vodafone UK and Telecom Finland signed the first international GSM roaming agreement. See GSMA (2016) *History*, available at <https://bit.ly/1sHjxSC>

⁵⁵ See on mobile coverage and DFS, Perlman, L & Wechsler, M (2018) *The Role of Mobile Coverage on Digital Financial Services*, available at www.dfsobservatory.com

⁵⁶ Some 100 million 'unbanked' adults worldwide receive government payments (G2P) in cash, including 67 million who have a mobile phone. Gallup (2018) *Global Findex: Technology Can Bridge Financial Inclusion Gap*, available at <https://bit.ly/2IhCoVE>

⁵⁷ The value in the airtime SVA is non-redeemable. Each have separate licensing regimes, and primary regulators. In the case of DCB, the NTA is that regulator, while it's the CB for DFS.

⁵⁸ 'M' is for money, and 'Pesa' is the Swahili word for money.

⁵⁹ For distinctions between these terms and between 'digital money' and 'e-money,' see Reiss, D (2018) *Is money going digital? An alternative perspective on the current hype*, available at <https://doi.org/10.1186/s40854-018-0097-x>

⁶⁰ DFSPs may provide payment services and/or e-money services, both of which may fall under different regulatory regimes reflecting their relative risks.

DFS Accounts: DFS embraces themes of using low cost digital devices for low-cost access to and use of financial services offered by banks and/or non-banks as DFSPs using prefunded Stores of Value (SOV) in SVAs holding electronic value under prudential supervision and operated and controlled by a DFSP.

E-Money: For DFS, the SOV is electronic money (e-money) which is created when sovereign⁶¹ fiat⁶² currency value is placed within an ‘e-money’ prudential regime.⁶³ E-money issuance and storage however is highly regulated, requiring the DFSP to hold an ‘e-money issuer’ (EMI) license from the Central Bank (CB). Any funds collected from customers by DFSPs (acting as EMIs) to be used for e-money purposes must be placed (‘pooled’) in a prudentially supervised bank account, the account – usually as a trust account⁶⁴ - itself subject to ring-fencing protections that prevent the pooled funds from being used for operational or other non-prudential purposes. Often the CB insists that a special financial services entity must be formed for operating as an EMI or for providing DFS.⁶⁵ And to prevent potential inflationary and systemic effects[A1] of allowing more spending for value received, ‘e-money’ is only issued if it is backed by an equivalent amount of fiat money in the pooled account - the so-called 1:1 ratio.

Depending on when they were formulated, definitions of DFS vary throughout developing market sector role players.⁶⁶ We see DFS as an ecosystem providing low-cost, national access to a broad range of financial and related services using primarily text and graphical based user interfaces, digital access devices such as mobile phones, and digital value transfer channels. DFS can be offered by banks and non-bank providers – known as DFSPs - who may be licensed or authorized by a range of regulators to provide these services, either on their own or in mandated partnerships. The GSMA-popularized term ‘mobile money’ is now considered one of the components of the DFS ecosystem, itself a far broader term beyond mobile-only (and MNO-only) provision and may often include DFSPs and bank offering basic accounts.

Some DFSPs may be classed as electronic money issuers (EMIs) and be allowed to issue e-money. Other DFSPs may only provide payment services and thus be licensed or authorized as payment service providers (PSPs). MNOs in most jurisdictions fulfil both roles as a DFSP. The central bank is usually the lead regulator in DFS, often seen to be providing an enabling regulatory environment lowering barriers to entry for new participants and novel services.

Exhibit 3: Conceptions of DFS

⁶¹ Compared to national fiat currency, as national does not apply to for example the Euro.

⁶² *Fiat* means, in essence, currency (money) issued by a central bank and backed as a SOV by the state. Compare this to virtual currencies such as mobile airtime value ‘issued’ by an MNO; or to crypto currencies - such as Bitcoin and Ether - which are mostly cryptographically secured and derived, tradable currencies created and issued mostly without a central issuer. Digital fiat currencies on the other hand are cryptographically secure versions of fiat currencies, issued by a central bank.

⁶³ E-money is a prudential construct usually derived from a regulatory process. Examples of the unit of account of the fiat currency may be for example the US Dollar, British Pound, Kenyan Shilling. In the DFS context, any fiat value received by DFSP acting as an EMI from a customer directly or via an agent or super-agent must be placed in the ring-fenced current account at a licensed and approved bank, or series of banks up to certain maximum percentage. E-money is created from this placement.

⁶⁴ Trust accounts are protected accounts where pooled customer funds are housed. It is however only known in common law jurisdictions, with civil law jurisdictions using instead protective vehicles such as escrow accounts or some insurance bond. See thereto, Perlman, L (2012) *LLD Thesis: Legal and Regulatory Aspects of Mobile financial Services*, available at <https://bit.ly/2KGfC8k>

⁶⁵ In India, these are called ‘payment banks.’ In Kenya, these are called ‘trust companies’ See Kumar, K & Raman, A (2015) *Did India’s CB get Payments Bank Approvals Right?*, available at <https://bit.ly/2stdae7>; Perlman, L (2012) *LLD Thesis: Legal and Regulatory Aspects of Mobile Financial Services*, available at <https://bit.ly/2KGfC8k>

⁶⁶ See variations in definitions of key DFS (and ‘mobile money’)-related terms from the following: IMF (2018) *Definitions for FAS*, available at <https://bit.ly/20OjxWg>; World Bank (2018) *Findex Little Book*, available at <https://bit.ly/2v04gWJ>; GSMA (2018) *Mobile Money Glossary*, available <https://bit.ly/2qgSbK5>; ITU DFS Focus Group (2017) *DFS Glossary*, <https://bit.ly/2yweHmK>

In most jurisdictions, value placed in a SVA by a customer is not seen by the CB as constituting a deposit, and correspondingly will not automatically earn interest, nor will it automatically attract deposit insurance.⁶⁷ The ‘pooled’ customer funds placed by the DFSP as an EMI in a (trust) bank account is mostly - but not in all jurisdictions - seen as deposit, and may be eligible for deposit-related insurance. In jurisdictions where trust accounts are not available, EMIs must/may hold the pooled funds in the central bank or invest in other liquid assets such as government bonds/treasury bills.

Cash-In, Cash-Out (CICO): Digital liquidity – the instantly accessible e-money value placed and stored in a SVA - within a DFS ecosystem is usually facilitated by electronic-human combinations of human ‘agents’ of DFSPs and banks. Agents provide what are known as CICO services, swapping cash for e-money and vice versa. Value in the SVA is redeemable on demand and on par at these agents.⁶⁸

Customer Identification and Verification (CIV) Schemes: The SVA is subject to an anti-money laundering (AML) regime and CIV process⁶⁹ requiring, in most cases, formal identity documents for signup to obtain a SVA and for undertaking transactions. New biometric-type identities – known as electronic identification documents (eIDs) – facilitate better CIV processes when using for evolving electronic know your customer (KYC) systems.⁷⁰ Entry-level DFS SVAs operated and controlled by the DFSP have reduced forms of CIV, and must be pre-funded by users. SVA are usually used for transactional activities such as bill payments and P2P transfers rather than savings. There are often cash components to some channels, where cash is inter-convertible to regulated e-money by agents in a scheme called CICO.

DFS-type Services: Service bouquets for DFS have grown,⁷¹ in many cases resembling basic transactional features of a bank account but currently with primarily non-credit, transactional services at their core.⁷² For example, the fiat-based DFS SVA can be used for paying for digital and physical goods and services as well as to undertake P2P value transfers between recipients of the same DFSP,⁷³ or where interoperability is present, between other DFSPs and banks.⁷⁴

⁶⁷ This restriction appears to derive from concern that interest payments may be the prelude to intermediation. The usual scheme is that the DFSP (as an EMI) does not pay interest to the customer for their SVA. Rather the DFSP/EMI may pass on the interest revenue earned from holding the pooled fund in a bank account to the customer. DFSPs are usually not allowed to use the pooled funds for investing in other instruments. The strict approach is however slowly changing: a recent World Bank report indicates that 13% of EMIs are allowed to pay interest on customers’ SVA. In 8% of cases, they are allowed to share profits with their SVA customers. The first countries to allow interest payments on DFS SVA balances were Ghana (2017) and Tanzania (2015) DFSPs are also now being allowed to provide credit in conjunction with a licensed bank, but usually not from the ‘pooled’ funds. MFIs though have been able to provide credit as part of their founding charters, but different rules may apply to their lending practices if they become DFSPs. See World Bank (2017) *Global Financial Inclusion and Consumer Protection Survey 2017 Report*, available at <https://bit.ly/2JrwFOJ>

⁶⁸ Withdrawal fees may be applicable however. To stimulate digital liquidity in a DFS ecosystem, in many countries cash-in at agent to ‘buy’ e-money is free to the customer: the agent is paid by the DFSP for this however.

⁶⁹ See **Section 2.5.4.3**

⁷⁰ See **Section 2.5.3.1** below on ID systems

⁷¹ See **Section 3.3** on Services in DFS

⁷² Unlike the value in most bank accounts, no interest is provided on SVA balances in most DFS implementations. ITU (2016) *Digital Financial Services: Regulating For Financial Inclusion – An ICT Perspective*, available at <https://bit.ly/2w8ryfT>

⁷³ MNOs uniquely can operate both – but separate - mobile airtime-SVAs and fiat-based SVAs. The former, in the form of DCB, can only be used for purchasing digital goods and services and doing mobile airtime-based airtime transfers. The CB regulates the fiat-based SVA, while the NTA usually regulates the airtime-based SVA.

⁷⁴ See **Section 2.5.4.2** on Transaction Processing Ubiquity

2.3 Mobile Technology and User Interfaces

In countries where DFS is provided, the majority of phone usage in rural areas involve connections using low-speed (narrowband) second generation (2G) GSM technologies, with third generation (3G) and fourth generation (4G) technologies mostly only available in urban and peri-urban areas. Similarly, while there has been significant growth in the smartphone penetration in developing countries, the GSMA report that majority of user access to DFS worldwide is still via ‘basic’ or ‘feature phones’⁷⁵ whose design – shown in **Exhibit 4** – in the most part limits access to DFS to primarily text-based types user interfaces (UI) such as Unstructured Supplementary Service Data (USSD) and SIM⁷⁶ Application Toolkit (STK). USSD transactions continue to be the choice for the vast majority of (‘mobile money’) users.⁷⁷ Lack of high speed mobile coverage is seen as embedding the need for feature phones.⁷⁸

The various DFS UIs appearing on different types of mobile phones have varying degrees of ease of access, ease of use, efficacy, cost, security, and reliability. USSD can be used for transmitting information and accessing standard services and VAS. Because USSD can be used across all generations of phones, it has been termed ‘The Third Universal App.’⁷⁹ USSD and STK, in particular, are very sensitive to a poor mobile coverage, affecting the ability of DFS customers to reliably access and use funds in their SVA.⁸⁰

USSD may however be required even with smartphone app use, for example by the use of Network Initiated (NI/Push) USSD for 2 factor authentication for security in financial/banking applications. In Rwanda, the smartphone DFS apps still use USSD, which the MNOs there say speaks to market demand for a ‘familiar’ interface.⁸¹

Poor mobile coverage when using USSD may cause unexpected and instant termination of a USSD session and thus untimely termination of a DFS transaction. Repeated instances of drop-off, may lead many users who are technically or financially literate to retry a transaction thinking the transaction was not completed. Invariably, they may begin to distrust the UI and whether their funds are safe and abandon their account usage, rather undertaking transactions from the ‘safety’ of an agent in their village or town. A transaction where an agent does the full transfer of value as payment or remittance to another use but without the use of the customer’s SVA is usually known as an Over-The-Counter (OTC) transaction.⁸²

These USSD-based UIs are also competition-sensitive, with gateways required to provide USSD and STK controlled by MNOs who may compete with DFSPs.⁸³

⁷⁵ GSMA (2018) *2017 State of the Industry Report on Mobile Money*, available at <https://bit.ly/2CKPLqF>. See data also from Perlman, L (2017a) *Technology evolution and innovation in DFS*, available <https://bit.ly/2CEufm>; and Perlman, L (2017b) *Technology Inequality: Opportunities and Challenges for Mobile Financial Services*, available at <https://bit.ly/2r7nzny>. Feature phones include the voice, SMS, interactive voice response (IVR), USSD and STK capabilities of basic phones, augmented though by features such as Bluetooth, and data-dependent Multimedia Messaging Service (MMS) and wireless access protocol (WAP). A few feature phones have 3G and higher data capabilities but most lack built-in Near Field Communication (NFC)-support. Basic phones are characterized by the total absence of any mobile data capabilities.

⁷⁶ Subscriber Identity Module, a smart chip (card) issued and sold by MNOs directly or through agents. When placed in a phone, a SIM card facilitates the basic access to MNO and other services. SIM cards also house small applets used for STK-based access to DFS. For the role of the SIM card in DFS, see Perlman, L (2012) *LLD Thesis: Legal and Regulatory Aspects of Mobile Financial Services*, available at <https://bit.ly/2KGfC8k>

⁷⁷ GSMA (2018) *2017 State of the Industry Report on Mobile Money*, available at <https://bit.ly/2CKPLqF>

⁷⁸ *ibid*

⁷⁹ Perrier, T, DeRenzi, B & Anderson, R (2015) *USSD: The Third Universal App*, available at <https://bit.ly/2vA3Skc>

⁸⁰ For a comprehensive overview on the role of mobile coverage in provision of DFS, see Perlman, L & Wechsler, M (2018) *The Role of Mobile Coverage on Digital Financial Services*, available at www.dfsobservatory.com

⁸¹ For technical details on NI-USSD, see Perlman, L (2017b) *Technology Inequality: Opportunities And Challenges For Mobile Financial Services*, available at <https://bit.ly/2r7nzny>

⁸² OTC means the transaction is entirely facilitated by an agent on behalf of a customer, who may or may not be identifiable or have a SVA at a DFSP/PSP.

⁸³ See also Perlman, L (2017c) *Competition Aspects of Digital Financial Services*, available at <https://bit.ly/2xxLcma>



Exhibit 4: Primary Phone User Interfaces for direct customer access to DFS. An exception – and perhaps a growing one⁸⁴ – to the 2G-text-based UI nexus is the growing use of Kaios⁸⁵ feature phone operating system designed as a hybrid between a smartphone and feature phone operating system.⁸⁶ This OS has had huge uptake in India where MNO Jio’s ‘JioPhone’ is given away virtually free. It has a feature phone form with the Kaios graphical UI. Feature phone penetration in India doubled in 1Q2018 because of the release of the JioPhone in 2017.⁸⁷

Large DFS deployments that rely primarily on USSD as the UI include bKash in Bangladesh, WING in Cambodia, EasyPaisa in Pakistan, MTN Money and Airtel Mobile Money in Uganda, ZAAD in Somaliland, M-PESA and Tigo in Tanzania, and EcoCash in Zimbabwe.⁸⁸

2.4 Transformational Innovations in DFS

Key to the development of DFS are transformative innovations to catalyze the ecosystem that differentiate DFS from traditional financial provision primarily by banks. These innovations include:

- Regulatory innovations for DFS provision
- Emergence of new actors⁸⁹
- Technological improvements and innovations
- Economic enablers

⁸⁴ Media Nama (2018) *India’s feature phone shipments doubled in Q1 2018*, smartphone market stayed flat, available at <https://bit.ly/2CR2bRH>

⁸⁵ MediaNama (2018) *Facebook app now officially available on the Jio Phone*, available at <https://bit.ly/2JuCIP1>

⁸⁶ KaiOS is a Linux-based operating systems and derivative of the now shuttered Firefox OS. It powers a number of phones and brands, and supports video calls over 4G; mobile payments through NFC and dual-SIM support. It has its own app store and Google has invested in it. See Verge (2018) *Google invests \$22 million in the OS powering Nokia feature phones*, available at <https://bit.ly/2EWhtHu>

⁸⁷ Media Nama (2018) *India’s feature phone shipments doubled in Q1 2018*, smartphone market stayed flat, available at <https://bit.ly/2CR2bRH>

⁸⁸ Hanouch, M & Chen, G (2015) *Promoting Competition in Mobile Payments: The Role of USSD*, available at <https://goo.gl/po24bd>

⁸⁹ These new actors could include non-banks and agents providing sign-up, bill payment, cash liquidity, and CICO services as well as aggregators.

Each are described below.

2.4.1 Regulatory Innovations

DFS has stimulated the emergence of novel responses and innovations from regulators and lawmakers to facilitate and supervise new mostly non-bank market participants. The innovations are not consistent across jurisdictions, and may depend to a large degree on public policy imperatives and even a hint of regulatory capture⁹⁰ in a country. Overall however, DFS has seen changes that allow non-banks to provide similar transactional services to banks, either alone or in a – sometimes mandated – partnership with a bank.

Enabling Environments: The regulatory environment allowing provision DFS is said to be ‘enabling’ or ‘non-enabling,’ terms first used by the GSMA⁹¹ in relation to the impact of local regulatory regimes on provision of DFS.⁹² The ‘enabling’ component refers primarily to whether any and all non-banks can independently provide DFS without a (mandated, ‘non-enabling’) need to partner with a licensed bank for that purpose.⁹³

Test and Learn: In many cases regulators have used regulatory forbearance – also known as ‘test and learn’⁹⁴ – to allow innovations to progress to operational commercial products even if there was no (direct) regulatory basis for providing these approvals. In the early iterations of DFS where there was no direct and obvious law or regulation allowing non-banks to provide bank-like financial services, many of the more progressive regulators used a regulatory vehicle called a ‘letter of no objection’ (LONO) to allow non-banks to these provide services. A variation of this approach using a system of published standardized requirements which is open to eligible qualifiers is now known as a ‘regulatory sandbox.’⁹⁵ In an even more direct approach, some regulators have themselves ‘become’ the third party, acting in catalytic role of financing and building the required financial infrastructure which is often then handed over to market participants to operate.⁹⁶ Often though, the regulatory innovations have been incremental or perfunctory, leaving incumbent banks to provide the financial services but now allowing non-banks or agents to provide frontline customer services sign as CICO and account signup.

Coordination: The overall complexity of DFS and its components – such as mobile access and new tiered forms of KYC⁹⁷ - has also necessitated closer cooperation between implicated regulators,⁹⁸ for example between the CB

⁹⁰ In Stigler’s ‘The Theory of Economic Regulation,’ the idea was introduced that regulators gradually begin to regulate their industry in way that may benefit the regulated industry, rather than the general public the regulator is meant to serve. See Stigler, G (1971) *The Theory of Economic Regulation*, available at <https://bit.ly/2RczFO6>

⁹¹ GSM Association. See www.gsma.org

⁹² For the GSMA view, see di Castri, S (2013) *Mobile Money: Enabling Regulatory Solutions*, available at <https://bit.ly/2kGPgqX>

⁹³ See further **Section 2.5.5.3**

⁹⁴ This was the approach of the Bank of Tanzania (BoT) in allowing non-banks to provide DFS in the absence of an enabling national payments law. A LONO was issued to them by the BoT and the NTA as an interim enabling measure. It is similarly used in Uganda in the absence of a National Payments Law.

⁹⁵ The first sandbox-like framework was set up by the US Consumer Financial Protection Bureau (CFPB) in 2012 as ‘Project Catalyst.’ For an overview of sandboxes in developing countries, see Wechsler, M; Perlman, L and Gurung, N (2018) *The State of Regulatory Sandboxes in Developing Countries*, available at www.dfsobservatory.com; and on their use for financial inclusion, see Jenik, I & Lauer, K (2017) *Regulatory Sandboxes and Financial Inclusion*, available at <https://bit.ly/2yDDGU0>

⁹⁶ The CB of Jordan built and operated the JoMoPay interoperable switch for DFSPs in Jordan. It is now co-owned by the CBJ and the industry association in a vehicle called JoPAC.

⁹⁷ For a recent sample list of KYC requirements for DFSP e-money accounts, see Staschen, S & Meagher, P (2018) *Basic Regulatory Enablers for Digital Financial Services*, available at <https://bit.ly/2s8b2YX>

⁹⁸ An interesting scenario encapsulating aspects of regulatory arbitrage in Bangladesh is based on the difference between MFS and DFS: the Post Office’s NAGAD ‘Digital Financial Service’ is drawing regulatory scrutiny from the central bank adherence to AML and Tier level requirements for what the central bank calls ‘Mobile Financial Service’ in its law. The Post Office says its service is a DFS service, so the strict precepts of the ‘MFS-based’ provisions do not apply to it. See The Independent (2018) *Post office MFS under scanner*, available at <https://shar.es/a19J2p>

and national telecommunications authority (NTA).⁹⁹ Attempts to prevent any regulatory arbitrage many manifest in Memoranda of Understanding between impacted regulators.¹⁰⁰

Standard Setting Bodies:¹⁰¹ While the of the regulatory innovations that have emerged around DFS are mostly organic, internal initiatives, they often reflect impetus of (top-level) inputs and strategies from Standard Setting Bodies (SSB) such as the World Bank; Bank of International Settlements (BIS); the Committee on Payments and Market Infrastructures (CPMI); the Financial Stability Board (FSB); International Telecommunication Union (ITU); the Financial Action Task Force (FATF); 3rd Generation Partnership Project (3GPP); the International Organization for Standardization (ISO); and from the Society for Worldwide Interbank Financial Telecommunication (SWIFT).

2.4.2 Emergence of New Actors

The ‘enabling’ innovations of regulatory policy have allowed new actors to emerge to provide DFS and related services, breaking the traditional hegemony of banks in provision of financial services. At the foundational level of DFS, these new actors include DFSPs, PSPs, agents, master agents and super-agents.¹⁰²

DFSPs: A DFSP may be a bank or, usually, a non-bank providing DFS within an ecosystem with or without authorization to issue and store a customer’s e-money in a SVA. The SVA is almost always prefunded, thus reducing any system risk due to non-payment of a counterparty. E-money can be created when the provider receives cash (a cash-in) from the customer - typically at an agent location - or when the provider receives a digital payment from another provider or bank. As noted above, issuers of e-money are often known as EMIs operating under a separate authorization regime that features prudential safeguards and capital requirements.

If an entity does not have authorization - such as an EMI - to issue and store value as e-money, it is usually viewed through a regulatory lens as a PSP offering services such as bill payment or remittances directly to customers. The PSP usually draws on an e-money SVA provided by an authorized EMI or from fiat bank money stored in a bank account as sources of value for a payment.¹⁰³ PSPs often fall under a different and lighter regulatory regime than EMIs, reflecting less risk posed to a national financial ecosystem. Some DFSPs – such as MNOs or their financial subsidiaries – may act as both a PSP and an EMI either under one omnibus licenses, or under separate licenses if the regulatory regime reflects the different roles and risks.

Agents: DFSP agents may be informal vendors or small but formal businesses - versus bank branches in non-DFS environments - who provide frontline services to customers. Agents though may serve multiple principals, for example banks and MNOs. They may often fall under different regulatory regimes (and restrictions)¹⁰⁴ depending on the services they provide. Services in the DFS domain include signing up customers,¹⁰⁵ receiving (cash) value

⁹⁹ Emerging ‘regtech’ solutions using automated regulatory tools such as artificial intelligence (AI) to replace manual processes are designed to assist regulators in coordinating extended remits caused by the complexity of DFS, see Perlman, L & Gurung, N (2018) *Use of Regtech by CBs and its Impact on Financial Inclusion*, available at www.dfsobservatory.com

¹⁰⁰ For a model Memorandum of Understanding (MOU) between a CB and the NTA on DFS, see Perlman, L (2018) *Model MOU Between a central Bank and National Telecommunications Authority For Digital Financial Services Regulation*, available at www.dfsobservatory.com

¹⁰¹ The role of SSBs is further detailed in **Section 2.5.5.2** on Factors and Components in Regulatory Development

¹⁰² Different terminology is used for similar agent actors in different countries and there may also be other actors depending on the country context. For example, they may be master-agents, sub-agents, cash merchants, wholesale cash merchants, retail agents, wholesale agents, agent network manager.

¹⁰³ The regulatory regime for DFS is often bifurcated to reflect payment-related activities that do not necessarily involve the provider accepting and storing value for an extended period, versus those undertaking such activities as well as storing customer value as ‘e-money.’

¹⁰⁴ For example bans on providing services to only one provider or their DFS role they may fall under the CB; any MNO-related roles may fall under the NTA.

¹⁰⁵ Agents and other third parties are usually permitted to verify the identity of customers.

to be converted and then stored as e-money in customer transactional SVA; and then to convert customer e-money to cash. Others may undertake - where licensed and/or allowed OTC transactions such as remittance transfers and bill payments. Agents may also be able to receive and submit to the DFSP or bank a deposit account application; receive and submit to the institution a loan application; open a customer account following the institution's policies; open a basic account; analyze and approve a loan following the institution's policies and limits; receive deposits; and disburse loans.¹⁰⁶ Often they also sell mobile airtime vouchers¹⁰⁷ on behalf of MNOs. Thirty countries now have ten times more active agents than bank branches.¹⁰⁸

Super and Master Agents: In many cases, there are additional layers of agent services provided by what have become known as 'super agents' and 'master agents.' Definitions vary across markets, but super agents usually facilitate liquidity management and may be banks or specialized entities. Master agents can do some or all of the following: recruit, train, monitor, or provide liquidity support to their agent network. At a prudential level, they may act as principal agents for DFS agents in certain geographical areas whilst facilitating and managing cash liquidity for these agents in rural areas.

2.4.3 Technology Improvements and Innovations

Mobile Phones: Improvements in mobile network technology and coverage have allowed the leveraging of features of GSM mobile technology¹⁰⁹ to act as both an access mechanism and a seamless UI for navigating DFS service options. There is also greater reliability, affordability and sophistication of mobile handsets, particularly smartphone use. Most DFS-focused countries though are primarily basic and feature phone based.¹¹⁰ While Android, Windows and iOS-type smartphones dramatically improve the UI for DFS, many of the smartphones applications provided by DFSPs around the world require sufficient mobile data speeds to ensure an optimal user experience (UX).¹¹¹

Mobile Coverage: With mobile phones as the primary access mechanism for services, access to DFS is highly dependent upon the degree and quality of mobile coverage.¹¹² UIs for access to DFS in particular are dependent on the type of mobile coverage which, in many cases in the developing world, is via slower (narrowband) 2G technology while faster broadband third and fourth generation (3G and 4G) mobile coverage is limited primarily to urban and peri-urban areas and along national road corridors. The primacy of 2G coverage in developing countries forces DFS customers to use non-intuitive, coverage-sensitive USSD. These UIs and resultant user experiences are sensitive though to the quality of the mobile coverage and signal, and for now limit the suite of (all) potential services to primarily basic transactional type of services. Inconsistent mobile coverage also forces users to have SIM cards and prepaid accounts for all MNOs they anticipate can provide service at particular locations.

Identity Systems: Identity systems required for CIV are improving, driven by national standardized and online mechanisms to identify and authenticate users using biometric data.¹¹³

¹⁰⁶ Staschen, S & Meagher, P (2018) *Basic Regulatory Enablers for Digital Financial Services*, available at <https://bit.ly/2s8b2YX>

¹⁰⁷ This valuable and entrepreneurial service was however banned in Uganda in July 2018, ostensibly for AML reasons. See Flash Uganda Media (2018) *UCC issue final deadline for selling airtime scratch cards*, available at <https://bit.ly/2ONXW0u>

¹⁰⁸ GSM (2018) *2017 State of the Industry Report on Mobile Money*, available at <https://bit.ly/2sdS85g>

¹⁰⁹ These include features such as voice, SMS and USSD.

¹¹⁰ For a study on the uses of phone types in DFS, see Perlman, L (2017b) *Technology Inequality: Opportunities And Challenges For Mobile Financial Services*, available at <https://bit.ly/2r7nznz>; and **Exhibit 4** describing the evolution of these devices and their use in digital access to financial services.

¹¹¹ *ibid.*

¹¹² See further Perlman, L & Wechsler (2018) *Mobile Coverage and the Impact upon Digital Financial Services*, available at www.dfsobservatory.com

¹¹³ See **Section 2.5.3.1** below for more detail on identity systems; as well as Perlman, L & Gurung, N (2018) *Focus Note: The Use of eIDs and eKYC for Customer Identity and Verification in Developing Countries: Progress and Challenges*, available at www.dfsobservatory.com; and ITU FG DFS (2017) *Identity and Authentication*, available at <https://bit.ly/2KistMX>

Customer-centric DFSP Platforms: Customer confidence in the new ecosystem is improved through new vendor platforms that allow non-banks to safely store both fiat-backed and airtime-based user value,¹¹⁴ including the ability for a DFSP to provide immediate proof of transaction and advice of charge.

2.5 Aspirational Use Cases Benefits of DFS

As noted earlier, DFS has been touted by national governments, donors, SSBs and various aid agencies as a means to reduce poverty by providing an inclusive system that provides a range of financial services facilitating nationally accessible, low cost means to access and moving funds, grow capital, and reducing risk inherent in cash-based economies.¹¹⁵

The digital ecosystem also promotes speed and transparency in transactions and is especially relevant in replacing cash-transfer mechanisms such as *hawala*,¹¹⁶ as well as avoiding of fund ‘leakage’ through middleman fraud by doing direct G2P payments into recipient SVA.

While it remains controversial,¹¹⁷ the growing body of user data generated through DFS and its component ecosystems may have ancillary benefits in creating a profile of users that can be used for providing credit.¹¹⁸ There is however concern that unbridled credit provision using this data to first-time applicants for credit¹¹⁹ may create situations where customers overextend themselves and land on credit blacklists.¹²⁰

It can also enable remitters to direct funds to savings, health, education fees or other types of targeted accounts that ensures funds are being spent as intended.¹²¹

2.6 Factors Needed To Initiate and Catalyze DFS

2.6.1 Overview

The following factors can be seen as critical for the successful provision of ‘basic’ transactional services in DFS:

¹¹⁴ See ITU FG DFS (2017) *DFS Vendor Platform Features*, available at <https://bit.ly/2L3wbL2>; also see the open-source Mojaloop payment system platform devised and funded by the Bill and Melinda Gates Foundation, at <http://mojaloop.io> and <https://leveloneproject.org>

¹¹⁵ The integrated, low cost access ecosystem, it is hoped, will contribute to *inter alia* G20, World Bank UFA2020 and UN SDG development goals of poverty reduction, economic growth, jobs, greater food security and agricultural production, women’s economic empowerment and health protection. ITU FG DFS (2017) *The Digital Financial Services Ecosystem*, available at <https://bit.ly/2BiFoNK>

¹¹⁶ Meaning ‘transfer’ or ‘trust’ in Arabic, the process of sending money remotely where cash is not actually sent and money never enters the formal financial system, made possible through the use of intermediary hawala dealers at each remote location. Perlman, L & Wechsler, M (2019, forthcoming) *Derisking and Its Impact on Financial Inclusion (draft title)*, available at www.dfsobservatory.com

¹¹⁷ In particular, MNO Call Data Record (CDR) data is being used to develop profiles of user based on mobile airtime recharge values and frequencies, calling circles, location, and type of phone. The controversy relates to whether users are aware that their CDR are being used for these purposes, and/or shared with third parties. Some smartphone-based credit providers gather data on the user from smartphone use.

¹¹⁸ CDR data is being used in Kenya to create alternative credit scores. See thereto, Blechman, J (2016) *Mobile Credit In Kenya And Tanzania: Emerging Regulatory Challenges In Consumer Protection, Credit Reporting And Use Of Customer Transactional Data*, available at <https://bit.ly/2x93hqE>

¹¹⁹ Credit often begins with low-value amounts, and then increases as the borrower pays back amounts as per an agreement with the credit provider.

¹²⁰ On concerns about credit provision in DFS and recently reported massive increases in the number of low-income Kenyans being added to credit blacklists, see Microsave (2017) *Is Digital Credit A Silver Bullet?*, available at <https://bit.ly/2CdhJMU>

¹²¹ ITU FG DFS (2017) *The Digital Financial Services Ecosystem*, available at <https://bit.ly/2BiFoNK>

- Market and Ecosystem Need
- Technology Infrastructure Readiness
- Enabling Regulatory Environment
- Ecosystem Service Providers
- Identity schemes fulfilling AML requirements

2.6.2 Market and Ecosystem Need

As noted above, the need for alternative means of access to financial services in the developing world because of the large numbers of the population financially excluded through a lack of access to financial services. Since banks have traditionally been the front-line for the provision of financial services such as savings accounts and for remittances, and therefrom the inability of especially those in rural areas to find and use a bank in their area or region, the financially excluded have also been referred to as being ‘unbanked’¹²² or ‘under-served.’¹²³

A key driver of DFS is that G2P social payments are now being paid into DFS SVAs, increasing digital liquidity for use in transactions and increasing efficiency in the payments system.¹²⁴ With a number of countries developing integrated e-government services, the ability to access and pay for any available services becomes a critical development driver in poverty alleviation goals.¹²⁵ These platforms have made DFS an attractive proposition for users to pay school fees, utility bills, hospitals, taxes and fines. Increasing acceptance by merchants of electronic payment instruments is also critical in moving from simple person-to-person (P2P) transactions to more economy-wide use.¹²⁶ Cross-border remittances are evolving, but AML concerns relating to beneficial ownership on recipient accounts tempered regulatory approvals for outgoing remittances.

But despite the growth in account opening and what seem to be compelling use cases for DFS, recent surveys indicate that this has not translated to active use of these accounts. This worrying trend is discussed below,¹²⁷ but often lack of use may be because of a user’s lack of confidence in their ability to navigate DFS systems – such as the USSD menus - or they may have lost money through error or fraud; or mobile coverage needed is lacking. Taxation¹²⁸ on mobile airtime use and on transactions may also have a dampening effect on use. This often drives poor people to limit or abandon their DFS usage and rather pursue OTC DFS services provided by agents.¹²⁹

¹²² The unbanked are so referred because they do not have a bank account, usually because it is not profitable for a bank to serve them, unless mandated to do so by a central authority. In Nepal for example, the central bank has mandated a certain number of bank branches in newly re-crafted district areas. See Gurung, N (2018) *Focus Note: Digital Financial Services in Nepal*, available at www.dfsobservatory.com

¹²³ That is, they have a bank account but there are no conveniently located bank facilities for them to use the account, be that a bank branch or ATM.

¹²⁴ The World Bank estimates that by shifting payments directly into SVAs, governments can increase the number of an adults with an account by at least 160 million - figures quoted in Stuart, G (2016) *Government to Person Transfers*, available at <https://bit.ly/2M1KUXh>

¹²⁵ See the UN’s 16 Sustainable Development Goals (SDGs) available at <https://sustainabledevelopment.un.org/sdg16>

¹²⁶ See ITU FG DFS (2017) *Enabling Merchant Payments Acceptance in the Digital Financial Ecosystems*, available at <https://bit.ly/2IWZJ09>

¹²⁷ See **Section 3.2.3** on DFS activity levels.

¹²⁸ See **Section 3.2.2**.

¹²⁹ OTC has been flagged by the CB in Bangladesh as a money laundering concern in so as unsatisfactory training of, and supervisory checking on agents by service providers and banks has led to CIV deficiencies and the rise of anonymous transactions the CB says it cannot trace. See Dhaka Tribune (2018) *Anonymous transactions raise risk of money laundering*, available at <https://bit.ly/2PU1nio>

2.6.3 Infrastructural Components

2.6.3.1 Identity Systems

Identity is a set of attributes that uniquely describes an individual or entity. It has become apparent that a crucial enabler of the DFS ecosystem is the need to identify users of not just DFS services, but also holders of mobile SIM cards.¹³⁰ Being able to do so at all or reliably is however dependent on a national identity system capable of identifying, validating, authenticating, and attesting to a person's claimed identity but also will also allow some sort of authentication based on the presented identity.¹³¹ Many countries still do not have a national identify system at all. Many countries however have sectoral IDs, for example under the control of a national transport department, the national voting authority, or the central bank. Some of these ID's are biometrically enabled, using so-called eKYC processes of fingerprint or iris scans to validate identity.¹³² Some but not all of the sectoral IDs may be acceptable for DFS and bank-related CIV purposes however.

Increased use of electronic identification over physical identification is also paving the way for the rollout in many emerging economies countries of national IDs using biometrics to create eIDs. These systems have as their overriding goals to advance a person's access to services, reduce identity fraud, and to increase financial inclusion.¹³³ These eIDs are particularly important for those countries affected by international derisking¹³⁴ resulting from AML-related concerns about lack of identification of beneficial ownership of DFS SVA and bank accounts.

Biometric eIDs will be used for CIV using eKYC systems at merchants, DFS agents, DFS offices and banks that have biometric capture devices, which may or may not be linked live to the national ID authority for instant attestation of the holder's claimed identity. Even with the noble intentions of uplifting the poor, often financial

¹³⁰ SIM registration may sometimes be sufficient to simultaneously open a 'basic' DFS account that does not allow cash-out, with additional CIV required for full SVA transactional functionality. In some countries, the number of DFS SVAs may be limited. In Jordan for example, a user may only have 2 DFS SVAs, even though they may have multiple mobile numbers and SIMs.

¹³¹ World Bank (2018) *Principles On Identification For Sustainable Development: Toward The Digital Age*, available at <https://bit.ly/2pZWkBY>. The UN's Sustainable Development Goals (SDGs) aims to achieve 'legal identity for all, including birth registration' by 2030. See 'Target 16.9' of the UN SDGs, available at <https://sustainabledevelopment.un.org/sdg16>, with financial inclusion and digitization of payments goals set by bodies such as Alliance for Financial Inclusion, the UN through the SDGs and the UNSGSA; the Global Partnership for Financial Inclusion (GPFI), and that of the Better Than Cash Alliance (BTCA). As the World Bank notes, identification is also a key enabler of Target 1.3 (implementing social protection systems), 1.4 (ensuring that the poor and vulnerable have control over land, property, and financial assets), 5a (giving poor women equal access to economic resources, including finance), 5b (enhancing the use of technology, including ICT to promote women's empowerment), 10.7 (safe and responsible migration and mobility), 10c (reducing the cost of remittance transfer), 12c (phasing out harmful fuel subsidies), 16a (strengthening the capacity to fight terrorism and crime), 16.5 (reducing corruption). Many central banks signed what is now known as the 'Maya Declaration,' a statement of common principles regarding the development of financial inclusion policy made by a group of developing nation regulatory institutions during the Alliance for Financial Inclusion's 2011 Global Policy Forum held in Mexico. See AFI (2011) *Maya Declaration*, available at <https://bit.ly/2Dism4S>

¹³² See the Aadhaar eID and eKYC system in India, considered the world's largest biometric database. United Identification Authority of India (2018) *United Identification Authority of India*, available at <https://uidai.gov.in>. In Jordan the identity-issuing agency is the Civil Status and Passports Department. For an overview of eKYC implementations worldwide, see Perlman, L & Gurung, N (2018) *Focus Note: The Use of eIDs and eKYC for Customer Identity and Verification in Developing Countries: Progress and Challenges*, available at www.dfsobservatory.com

¹³³ Aadhaar is part of the 'JAM Trinity' representing the government's goal to link every citizen's bank account number, mobile number with Aadhaar number for better financial inclusion policy. There is: (J) - Jan-Dhan Yojana (universal access to banking facilities – at least one per household); (A) - Aadhaar - Biometric identification/registration; (M) - Mobile Telephony – Service for everyone, solving the last mile problem.

¹³⁴ The termination of international correspondent banking relationships because of money laundering concerns. For a comprehensive overview of derisking and its effect on financial inclusion, see Perlman, L & Wechsler, M (2019, forthcoming) *Derisking and Its Impact on Financial Inclusion (draft title)*, available at www.dfsobservatory.com

inclusion and financial integrity goals may be in conflict: for example, lack of coordination between the internal/home affairs ministry developing policies and technical standards for national ID or the department or agency responsible for issuing a standardized, national ID can have unintended and negative consequences for DFS and financial inclusion and may lead to financial exclusion.¹³⁵ Thus while SIM registration can provide access to many services such as DFS, uncoordinated or overbearing regulations issued by regulators as part of their respective mandates may unintentionally exclude vulnerable and socially disadvantaged consumers.

2.6.3.2 Transaction Processing Ubiquity

The ability to undertake seamless digital transfer of value between (DFS) accounts at different providers is known as interoperability. This ability has been woefully lacking however, characterized more by ‘walled garden,’ siloed approaches by large DFSPs around the world, often those with significant market power (SMP).¹³⁶

Walled Garden: Within the DFS context, DFSPs may only provide transactional and value transfer services to its own customers.¹³⁷ That is, there is no ability to transfer value from one DFSP account to an account at another DFSP. In some cases, a DFSP may implement what is known as ‘token interoperability,’ whereby an account holder at DFSP-A may go to their local agent or use a value-transfer menu item on their phone to send value to a recipient at DFSP-B. Instead of receiving that value directly into their SVA, the recipient on DFSP-B may receive a ‘token’ in the form of a text message, with specific instructions on how to obtain the value, and a one-time reference number and linked PIN code that allows that recipient of DFSP-B to go to an agent of DFSP-A to perform a cash out of the value.¹³⁸

Bilateral Interoperability: In this method, bilateral agreements are negotiated between two DFSPs to create interoperability. Two technical implementations of this method are possible: first, DFSP-A is allocated a virtual ‘agent’ account at DFSP-B and visa versa. If a DFSP-A customer sends to a customer of DFSP-B, DFSP-A’s ‘agent’ account is debited with the value to be paid out to the recipient of DFSP-B.¹³⁹ In the second bilateral model, a third party aggregator will ‘switch’ the transactions and do ‘agent’ account balancing.¹⁴⁰

Centralized, Switched-based Integration: An interoperable DFS system requires the setup of an interoperable scheme and a switch, defined by a switch scheme¹⁴¹ with overarching standards such as business rules, governance

¹³⁵ The Ugandan SIM card registration process was affected during the course of 2017 by conflicts between the MNOs, the NTA and the government over deadlines for registration and availability of required ID documents. Users were switched off then on again following intervention by the president. New Vision (2017) *Telecom Firms Given 72 Hours To Deactivate SIM Cards*, available at <https://shar.es/1Pcmkq>

¹³⁶ See further on competition issues in DFS, Perlman, L (2017c) *Competition Aspects of Digital Financial Services*, available at <https://bit.ly/2xxLcma>

¹³⁷ The net effect is that customers in a DFS ecosystem cannot undertake direct account-to-account ‘interoperable’ digital transfers of value between DFSPs. A transfer from accounts within the same DFSP is known as an ‘on us’ payments. If it is digitally between accounts at different DFSPs, this is known as an ‘off us’ payment.

¹³⁸ The recipient need not have a DFS account at any DFSP though. They simply need to be able to receive using their mobile phone an SMS with the token sent by DFSP-A.

¹³⁹ Musa, O, Niehaus, C & Warioba, M (2015) *How Tanzania Established Mobile Money Interoperability*, available at <https://bit.ly/2H1UI0r>

¹⁴⁰ FSDU (2017) *Market Research on Interoperability in Mobile Financial Services In Uganda*, available at <https://bit.ly/2xw2sYW>

¹⁴¹ A scheme is characterized by a set of rules agreed between participants. Visa and Mastercard for example have their own credit card scheme rules.

models, technical standards, revenue splits between participants, common branding, and rules around disputes and customer protection.¹⁴² A number of countries are implementing this switched-based approach at a national level.

2.6.3.3 DFS Vendor Platforms

Platforms provided by third party vendors have been critical to the initial development of DFS, and similarly to DFS evolution. Consolidation and attrition over the past 20 years of ecosystem development has however left just a handful of vendors to provide scalable solutions. Ideally, the vendor solution should be modular, using service function interfaces based on standard protocols that render each layer independently from any other layer to make it easier to integrate different provider modules and facilitate high availability.¹⁴³ It could also support different access channels including mobile and web applications, as well as support connections to third parties using open application programming interfaces (API).¹⁴⁴ The Bill and Melinda Gates Foundation have developed open-source software and design platform called Mojaloop¹⁴⁵ for financial services companies, government regulators, and others taking on the challenges of interoperability and financial inclusion. Their intent is to give existing payment processors and providers a level playing field to connect to payment systems.

2.6.3.4 Ubiquitous Mobile Network Coverage

With mobile phones as the primary access mechanism for DFS, access to DFS is highly dependent upon the degree and quality of mobile coverage offered by MNOs. UIs for access to DFS are dependent on the type of mobile coverage which, in many cases in the developing world, is via slower (narrowband) 2G GSM technology. Faster broadband 3G and 4G mobile coverage is currently mainly limited to urban and peri-urban areas and along national road corridors.¹⁴⁶ With 2G-only coverage – a feature of rural areas in developing countries – users are mostly dependent on service and competition¹⁴⁷ quality-sensitive, text-based UIs such as USSD and STK. The UX with these UIs is poor and error-prone, often driving people to limit or abandon their DFS usage and rather pursue OTC DFS services provided by agents. Regular DFS SVA usage has reportedly dropped overall worldwide, with OTC use growing – a concern for regulators worried about traceability of transactions for AML purposes.¹⁴⁸

¹⁴² For example the JoMoPay DFS switch in Jordan, and Modelo in Peru. See CFI (2017) *Modelo Peru Brief*, available at <https://bit.ly/2LelAgg>

¹⁴³ See <https://leveloneproject.org>. The BMGF made available Mojaloop open-source software for creating a payment platform. The software is designed to provide a reference model for payment interoperability between banks and other providers across a country's economy. It is available free-of-cost, for software developers to adapt and banks, financial service providers and companies to implement.

¹⁴⁴ Data drawn from International Telecommunications Union Focus Group on Digital Financial Services (ITU FG DFS) (2017) *DFS Vendor Platform Features*, available at <https://bit.ly/2L3wbL2>. See also the open source 'Moja Loop' platform reference design from the BMGF Level 1 project: a number of vendors are producing APIs to connect to the Moja Loop platform. See <https://leveloneproject.org/>

¹⁴⁵ See also the open source 'Moja Loop' platform reference design from the BMGF Level 1 project: a number of vendors are producing APIs to connect to the Moja Loop platform. See <https://leveloneproject.org/>. Mojaloop was designed in collaboration with Ripple, Dwolla, ModusBox, Software Group, and Crosslake Technologies. The Bill & Melinda Gates Foundation provided funding and support through its Level One Project.

¹⁴⁶ For a detailed exposition of mobile coverage linkages to ubiquitous DFS provision, see Perlman, L & Wechsler, M (2018) *The Role of Mobile Coverage on Digital Financial Services*, available at www.dfsobservatory.com.

¹⁴⁷ On competition-related matters in DFS, see Perlman, L (2017c) *Competition Aspects of Digital Financial Services*, available at <https://bit.ly/2xxLcma>. On the effect of mobile coverage on competition in DFS, see Perlman, L & Wechsler, M (2018) *The Role of Mobile Coverage on Digital Financial Services*, available at www.dfsobservatory.com

¹⁴⁸ On these concerns, see in greater detail ITU FGDFS (2017) *Over the counter transactions: A threat to or a facilitator for digital finance ecosystems?*, available at <https://bit.ly/2ywZrbA>; and on AML concerns in Bangladesh with OTC, see Dhaka Tribune (2018) *Anonymous transactions raise risk of money laundering*, available at <https://bit.ly/2PU1nio>

2.6.3.5 Supporting Systems and Providers

As noted above, third party aggregators can fulfill a number of possible and important roles in DFS. In bilateral interoperability they often ‘switch’ the transactions and do ‘agent’ account balancing.¹⁴⁹ Technical Solution Providers (TSPs) will provide ancillary services, such a connectivity to national ID systems for biometric authentication; provide USSD and STK gateways and shortcodes; provide an ability for PSPs to link to MNO airtime-based and DFS-wallets to withdraw customer funds on a pull-push basis;¹⁵⁰ provide secure links between providers; as well as to Automated Teller Machines (ATM), and Automated Clearing House (ACH) networks.¹⁵¹

2.6.3.6 User and Merchant Interfaces

With basic and feature phones dominating most DFS markets, DFSPs currently mostly facilitate access to DFS systems via text-based USSD and the encrypted SMS-based STK – both UIs of which work on almost all GSM-based handsets.¹⁵² Smartphones in these countries are usually only found in urban and peri-urban areas, which match the 3G and higher mobile phone coverage available in those locations.¹⁵³ India expects smartphones to be the majority of phones in use by 2022,¹⁵⁴ but this goal is also dependent on whether there is sufficient high-speed data coverage to ‘power’ data-intensive smartphone applications, which in turn is largely dependent on telecommunications policy.¹⁵⁵

2.6.4 The Regulatory Environment for DFS

2.6.4.1 Overview

DFS implementations to date have highlighted the emergence of novel responses and innovations from regulators and lawmakers to facilitate the entry, and then supervision of, new non-bank market participants.¹⁵⁶

This evolving legal and regulatory environment usually include distinctions between the policy decisions, the legal frameworks to execute on these policy decisions, and a sector or market conduct regulator to issue specific regulatory instruments, and to enforce these instruments:

- Policy decisions by ministry, parliament or similar high decision-making body
- Laws that implement a decided policy framework

¹⁴⁹ FSDU (2017) *Market Research On Interoperability In Mobile Financial Services In Uganda*, available at <https://bit.ly/2xw2sYW>

¹⁵⁰ See above for a description of pull-push.

¹⁵¹ As suggested by the IFC, where general-purpose financial infrastructure is lacking, there is an opportunity for incumbent banks to leverage their position of already having payments, identity and trust assets in place to expand rapidly in partnership with fintech companies that can help fill gaps in banks’ channels, product sets, and processing capabilities. See IFC (2017) *Digital Financial Services: Challenges and Opportunities for Emerging Market Banks*, available at <https://bit.ly/2H369oJ>

¹⁵² Not all (Android) smartphones support STK.

¹⁵³ A number of ‘contactless’ facilities such as NFC and linkages of fiat-backed DFS accounts to companion debit cards are also spurring the growth of merchant payments. ITU FG DFS (2017) *Enabling Merchant Payments Acceptance in the Digital Financial Ecosystems*, available at <https://bit.ly/2IWZJ09>

¹⁵⁴ Financial Xpress (2018) *Giant leap: India to have over 500 million smartphone users by 2022*, available at <https://bit.ly/2PIOAIB>

¹⁵⁵ National telecommunication policies include shutting down analogue TV signals, and using the valuable long-range spectrum for mobile data use especially in rural areas. NTAs and governments will usually sell or auction this newly available spectrum as part of a ‘digital dividend.’ For a comprehensive overview on the role of mobile coverage in provision of DFS, see Perlman, L & Wechsler, M (2018) *The Role of Mobile Coverage on Digital Financial Services*, available at www.dfsobservatory.com

¹⁵⁶ Often though the regulatory innovations have been incremental or perfunctory, leaving incumbent banks to provide financial services directly but (now) allowing non-banks or agents to provide frontline customer services sign as CICO and account sign up.

- Normative acts within the remit of particular regulators such as regulations, circulars, and guidelines or inter-regulator MOUs to second powers.¹⁵⁷
- Methods to check on the market conduct of entities under the direct remit of the regulator, for example, using oversight,¹⁵⁸ supervision¹⁵⁹ and market-monitoring tools.¹⁶⁰
- Methods to monitor the market the market as a whole. These may include (new) regulatory technology (regtech) tools.¹⁶¹

The extent to which a legislative framework exists for enabling DFS and its service and participatory components varies greatly around the world. The regulatory exigencies of regulators differ though between the developed and developing world, with the latter focused on laws and regulations that fit national inclusion strategies.¹⁶²

Except for a few notable exceptions,¹⁶³ in many of the early implementations of DFS (when also known as ‘mobile money’), laws, regulations, supervision and oversight fastening on the DFS ecosystem followed what is known as an *institutional* approach. Here specific sector regulators had supervisory oversight and rule-making capacity over institutions within their regulatory domain. The traditional *institutional*¹⁶⁴ approach to regulation of DFS that in effect only allowed licensed banks to provide financial services under a bank license regime. Thus, for example, banks were regulated by the national banking regulator and telecommunications-related entities by the NTA. If a new non-bank market participant wanted to provide even basic transactional financial services that emulated basic

¹⁵⁷ For an example of a model MOU between a NTA and CB, see Perlman, L (2018) *Model MOU Between a central Bank and National Telecommunications Authority For Digital Financial Services Regulation*, available at www.dfsobservatory.com

¹⁵⁸ *Regulation* is said to be prescriptive, often quantitative, and generally not very flexible. It may prohibit an activity or prevent it. Definition from Federal Reserve Bank Of New York (1997) *Patrikis: Supervision and Regulation*, available at <https://nyfed.org/2kAeozL>

¹⁵⁹ *Supervision* is more qualitative and involves the safety and soundness of specific institutions. It depends upon the judgment of an examiner or inspector, needing close, first-hand, observation and analysis. Definition drawn from Federal Reserve Bank Of New York (1997) *Patrikis: Supervision and Regulation*, available at <https://nyfed.org/2kAeozL>

¹⁶⁰ *Oversight* is considered much less intrusive than supervision and might be viewed as surveillance, normally conducted at a distance. Definition drawn from Federal Reserve Bank Of New York (1997) *Patrikis: Supervision and Regulation*, available at <https://nyfed.org/2kAeozL>

¹⁶¹ On the role of regtech in financial inclusion, see Perlman, L & Gurung, N (2018a) *Use of Regtech by Central Banks and its Impact on Financial Inclusion*, available at www.dfsobservatory.com

¹⁶² Where the legal and regulatory framework for non-bank participation in DFS to catalyse financial inclusion goals does not directly exist however, this has often required a novel response from regulators, described below.

¹⁶³ For example in Kenya, where MNO Safaricom was given a Letter of No Objection (LONO) by the central bank in the absence of jurisdiction of the banking law over the planned service.

¹⁶⁴ The institutional and functional approaches are two broad approaches to the issue of regulation and which may also reflect variations in legal frameworks. The functional approach places the focus on the service received by the consumer regardless of the type of institution providing that service. This broad protection may be the remit of specific consumer protection agencies, competition authorities, or ministries of trade and industry. The issue however, is that while this ‘catch-all’ appears to provide recourse insofar as all institutional types are concerned, the reality is that these entities may ultimately lack the necessary institutional capacity and specialized knowledge to pronounce on, for example, complicated aspects of financial consumer protection. Thus, multiple regulators may have (ineffective) remit over the same entity for different reasons, and may result in consumer ambivalence, corporate intransigence and posturing, and thus the effective maintenance of the *status quo*. A SRA may be overwhelmed when obliged to address financial sector complaints in addition to other economy-wide consumer protection issues. In contrast, the institutional approach focuses not on the service per se, but on the institutions providing any financial service. It supposedly leaves the regulation in the hands of specialized bodies, for example, the central bank (CB), which may implement consumer protection provisions in relation to regulated financial institutions. However, this approach may distort market dynamics by fragmenting responsibilities amongst too many regulators to the extent that some entities like nonbanks are not captured. Implementation may also be challenging insofar as multiple regulators with varying levels of capacity may be required. There is often, however, no one-size-fits-all solution to the design of a legal framework for financial consumer protection, and for coherence and maintenance of the financial system generally. It should reflect the structure of the financial system and the nature of each economy’s overall legal framework. This may take the form of specific, single, dedicated agencies to deal with consumer protection issues relating to specific or general aspects of retail financial services.

bank account functions, they would invariably not fit into the institutional categorization described in the laws and regulations and thus invariably would not be able to independently offer DFS services, with a banking partner often required. Banks though saw the low-cost model of DFS as cannibalizing their account base, and often limited their resources in partnering with non-bank DFSPs.

As the dampening effects of the institutional (bank-centric) approach to DFS enablement became evident,¹⁶⁵ a *functional*¹⁶⁶ approach to regulation has been embraced by many regulators. Here regulation is focused on the service offered rather than the entity providing it. The effect was to allow non-bank entities such as MNOs and DFSPs to offer banking-like financial and transactional services through DFS, subject to a proportional regulatory regime that matched the perceived risk of these services to the degree of required regulation and supervision. In this new disruptive formulation, the evolving regulatory environment in relation to facilitating DFS provision by non-banks is said to be ‘enabling’ or ‘non-enabling,’¹⁶⁷ with the institutional approach restricting DFS to a ‘bank-centric’¹⁶⁸ approach seen as non-enabling.¹⁶⁹ Aspects of a foundational ‘enabling and proportional’ regulatory environment for DFS ignition and catalyzation are discussed below.

2.6.4.2 The Regulators of DFS

DFS is an emerging and evolving ecosystem, with a similarly dynamically evolving¹⁷⁰ regulatory environment.¹⁷¹ Generally, the DFS-related regulators may include prudential regulators; financial integrity regulators; sector regulators and market conduct regulators.¹⁷² The core regulatory authorities required then to provide a ‘foundational’ enabling environment for DFS include the country’s CB, its NTA, and its financial intelligence unit

¹⁶⁵ See **Exhibit 10** which shows World Bank Findex 2017 comparative data demonstrating account growth of DFS markets using enabling or non-enabling regimes.

¹⁶⁶ See on the ‘regulating by function’ rather than by the institution providing that function (service), Schwarcz, S (2014) *The Functional Regulation of Finance*, available at <https://bit.ly/2CTCDDq>; Cunningham, L & Zaring, D (2009) *The Three or Four Approaches to Financial Regulation: A Cautionary Analysis Against Exuberance in Crisis Response*, available at <https://bit.ly/2PD26rq>; G30 (2008) *The Structure of Financial Supervision Approaches and Challenges in a Global Marketplace*, available at <https://bit.ly/2QaQgSl>; Greenacre, J (2018) *Regulating mobile money: a functional approach*, available at <https://bit.ly/2CXs4zi>; Perlman, L (2012) *LLD Thesis: Legal and Regulatory Aspects of Mobile Financial Services*, available at <https://bit.ly/2KGfC8k>, and also CDG (2016) *Financial Regulations for Improving Financial Inclusion*, available at <https://bit.ly/2shcPL9>. CDG define this approach as functional approach (to financial services regulation) where ‘services of the same nature are regulated in the same way, rather than, for example, according to the type of provider.’

¹⁶⁷ These were terms first used by the GSMA in relation to the impact of local regulatory regimes on provision of DFS. See di Castri, S (2013) *Mobile Money: Enabling Regulatory Solutions*, available at <https://bit.ly/2kGPgqX>. An ‘enabling’ regulatory environment is described in *inter alia* Gutierrez, E & Singh, S (2013) *What Regulatory Frameworks are More Conducive to Mobile Banking? Empirical Evidence from Findex Data*, available at <https://bit.ly/2JV1WsF>. See also Porteous, D (2006) *The enabling Environment for Mobile Banking in Africa*, available at <https://bit.ly/2JxtOzz>. For an assessment of how enabling environments have evolved and whether they have worked to enhance financial inclusion, see Staschen, S & Meagher, P (2018) *Basic Regulatory Enablers for Digital Financial Services*, available at <https://bit.ly/2s8b2YX>

¹⁶⁸ The notion of a licensed bank being the primary pivot (by regulation) in DFS provision – originally termed ‘bank-led’ - was introduced in CGAP’s 2008 study of what was then commonly known as ‘branchless banking.’ See Lyman, T, Pickens, M & Porteous, D (2008) *Regulating Transformational Branchless Banking*, available at <https://bit.ly/2LORgdn>

¹⁶⁹ See di Castri, S (2013) *Mobile Money: enabling Regulatory Solutions*, available at <https://bit.ly/2kGPgqX>. The non-bank DFSP may be restricted from providing any DFS services other than as a supportive agent network for a bank.

¹⁷⁰ For a recent gender perspectives on regulatory enablers for DFS, see Bin-Humam, Y, Izaguirre, J-C & Hernandez, E (2018) *Regulatory Enablers for Digital Finance: A Gender Perspective*, available at <https://bit.ly/2PV4SFz>

¹⁷¹ Laws, regulations, supervision and oversight though have traditionally followed an institutional approach, whereby specific regulators have had supervisory oversight and rule-making capacity over institutions within their regulatory domain. Thus, for example, banks have traditionally been regulated by the national banking regulator and telecommunications entities by the NTA.

¹⁷² Regulators may ‘extend’ their remits over DFS and its enabling components even and especially where there is no direct legal basis for doing so: this reach is usually achieved by using omnibus powers in that regulatory bodies’ establishment statute.

(FIU) on AML matters. This ensemble reflects the primarily transactional iterations of a DFS ecosystem in its foundational stage, and the number of impacted regulators will increase as service offerings evolve.¹⁷³

In particular, as service offerings, competition-based complexities increase and the DFS ecosystem generally evolves, additional regulators - outlined in **Exhibit 5** - will be impacted and become part of the regulatory ecosystem for DFS. These may include other prudential regulators, other sector regulatory authorities (SRAs); and market conduct regulators. There may be co-jurisdiction between regulators over a similar domain or issue, for example on AML and competition issues.

Central Bank: In most jurisdictions, the CB as the apex bank in the country is the lead regulator in DFS. It will, at a minimum, set licensing and authorization criteria for DFSPs and e-money issuance; establish consumer protection mechanisms; set safety and soundness guidelines including schemes for safeguarding of pooled funds and user accounts; set AML/CIV policies for SVA use; establish quality of service (QOS) and risk management guidelines for services; set agent standards; and many often also set interoperability standards and policies. In some cases it may also act in a catalytic role of establishing or building a national interoperable platform or switch that integrates a DFS ecosystem with its e-money-based SVA and agent networks with ‘traditional’ financial ecosystems such as those involving ATM and card networks.

National Telecommunications Authority: The NTA primarily acts in supporting role to the CB in DFS with its jurisdiction usually limited to issues related to the modalities surrounding access to primary DFS bearer channels such as USSD and STK. The NTA also regulates critical SIM card registration process. If the provider is a licensed MNO,¹⁷⁴ the NTA may be directly involved in regulating that DFSP through some type of authorization for provision of DFS-type services as a value added services (VAS) license.¹⁷⁵ It may also insert itself in discussions on interoperability between DFSPs and other participants.¹⁷⁶ And while it is usually the NTA or a technology ministry’s primary competency, the CB may include security and risk management requirements for use of bearer services such as USSD in its licensing requirements for DFSPs.

Financial Intelligence Unit: The FIU - also known as a ‘financial intelligence authority’ or AML Unit - will usually specify minimum standards to be followed for CIV and AML activities, as well as for specifying DFS transaction tier limits. The FIU policies – sometimes granular, but more often than not principles-based - would then ‘trickle down’ to the other regulators to apply in more granular form any rules based on a risk-based approach (RBA) to their own supervised entities. A RBA is generally based on guidelines and principles – rather than rules - for addressing a particular risk, so as to lead to a desired outcome.¹⁷⁷

¹⁷³ Service offerings and capabilities in DFS 2.0 and beyond may include bilateral interoperability between DFSP and independent credit provision by DFSPs.

¹⁷⁴ It may also intervene if there are competition-related concerns on that licensee not providing access to scarce resources at FRAND terms.

¹⁷⁵ See on the role of the NTA, Perlman, L (2018) *The Role of the Telecommunications Regulator in Digital Financial Services*, available at www.dfsobservatory.com

¹⁷⁶ The NTA in Kenya for example threatened to split up MNO Safaricom if it did not integrate its dominant M-PESA DFSP subsidiary with other DFSPs in Kenya for interoperability purposes. Quartz (2018) *Kenya Won't Force A Spin-Off Of The World's Leading Mobile Money Service After All*, available at <https://qz.com/1212396>

¹⁷⁷ A feature of a RBA is that compared to a normative, rules-based approach, the supervisory entity does not specify the precise steps required to achieve the desired outcome, rather leaving it to the implementing entity to address the risks outlined in guidelines by implementing procedures and rules that are contextually relevant to it. The rules and procedure of each entity may thus differ, although the net effect of each variation is to address the risks outlined in the guidelines. On the use of a RBA for Customer Due Diligence (CDD), see FATF (2017) *Anti-Money Laundering and Terrorist Financing Measures and Financial Inclusion with a Supplement on Customer Due Diligence*, available at <https://bit.ly/2taubZM>; and Lyman, T & de Koker, L (2018) *KYC Utilities & Beyond: Solutions for AML/CFT Paradox?*, available at <https://bit.ly/2OqOgso>

Competition Regulator: A market conduct regulator such as the competition authority – if there is one as an independent entity - may for example set parameters for provision of access to scarce resources such as USSD and STK or at fair, reasonable and non-discriminatory (FRAND)¹⁷⁸ terms. It may in some jurisdictions have the power to order the ‘break up’ of entities who through a market study, have been found to have and SMP abused this dominance.

Additional Regulators: There are of course specialized laws and regulators who may have an omnibus remit over an entity, no matter the institution and service offered. These regulators, agencies, or government ministries may and usually are eventually be drawn into regulation, oversight, and policy-making of other components of the DFS ecosystem. These – where there are specific regulators formed - may include tax authorities; data protection regulators for use of customer information; technology ministries for technology standardization; consumer protection regulators; and home/internal affairs for ID document issuance and verification.

Memorandum of Understanding: The overall complexity of DFS and its components has also necessitated closer cooperation between implicated regulators, usually codified as bilateral or multilateral memoranda of understanding (MoUs).¹⁷⁹

Remit/Authority	Competition	FIU	Data Protection	Consumer Protection	CB	NTA	Tax
Authorization To Operate Services	Yes				Yes	Yes	
Data Privacy	Yes		Yes	Yes	Yes	Yes	
Consumer Protection	Yes		Yes	Yes	Yes	Yes	
Quality of Service	Yes			Yes	Yes	Yes	
Competition	Yes		Yes	Yes	Yes	Yes	
CDD/KYC/CIV	-	Yes	Yes	Yes	Yes	Yes	
Security	-	Yes	Yes	Yes	Yes	Yes	
Taxation	-				Yes	Yes	Yes
Transaction Data Monitoring	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Exhibit 5: Cross-jurisdictional remits in DFS for DFS-impacted regulators and their direct and extended remits over DFS and its enabling components. Core foundational DFS -related regulators will include the CB, the NTA, and FIU.

¹⁷⁸ See on FRAND policies and its effect on DFS, Perlman, L (2017c) *Competition Aspects of Digital Financial Services*, available at <https://bit.ly/2xxLcma>

¹⁷⁹ For a model MOU between a CB and the NTA on DFS, see Perlman, L (2018) *Model MOU Between a central Bank and National Telecommunications Authority For Digital Financial Services Regulation*, available at www.dfsobservatory.com

2.6.4.3 Factors and Components in Regulatory Development

Organic growth in capacity, internal learnings, technical assistance from external donors¹⁸⁰ and entities,¹⁸¹ peer interactions,¹⁸² and an evolution of outlook/thinking by key policy makers within regulatory bodies has facilitated regulatory reforms and innovations that to a large degree have allowed DFS and new participants to emerge to challenge the primacy of licensed banks as exclusive providers of financial account services.

Ultimately, unless a regulator uses creative methods¹⁸³ to extend their remit to regulate evolving components of DFS ecosystem, there may be no legal basis for their regulations and enforcement such that any activity in the DFS ecosystem may be subject to court review¹⁸⁴ and regulatory arbitrage.¹⁸⁵

An emerging trend in the tools of central banks and other regulators is the creation of what are known as ‘regulatory sandboxes,’ as flexible frameworks to facilitate beneficial innovation in the financial sector while still managing risks of newer technologies. Specifically, regulatory sandboxes can address regulators’ challenges to understand existing and emerging innovations, as well as fintech innovators challenges to understand complex regulations and regulatory expectations. Innovations are housed in controlled, safeguarded environments to live test innovations which would ordinarily be stifled by regulatory uncertainty or incompatibility under the regulator’s supervision for a limited duration. As of 3Q 2018, over 50 countries had operational or proposed regulatory sandboxes.¹⁸⁶

Exhibit 6: Regulatory Sandboxes and their Role in Financial Inclusion

And while many of the regulatory innovations that have emerged around DFS are mostly organic, internal initiatives, they often reflect impetus from (top-level) inputs, guidelines and strategies from banking and payment-oriented supra-national SSBs such as FATF or the BIS noted earlier.¹⁸⁷ Most CBs for example will in some form implement recommendations from these SSBs in national law, regulations or directives, guidances, by-laws, or

¹⁸⁰ See **Section 2.6** on the Role of Donors and Supporting Organizations

¹⁸¹ There are many example of TA: for example in Nepal, United Nations Capital Development Fund (UNCDF) assisted the Nepal Rasta Bank to implement a GIS system to map all financial points in Nepal. Gurung, N (2018) *Focus Note: Digital Financial Services in Nepal*, available at www.dfsobservatory.com. In Tanzania in 2014, the IFC through interaction with the central bank and industry, helped facilitate the introduction of the first effective interoperability in DFS in the world. See Musa, O, Niehaus, C & Warioba, M (2015) *How Tanzania Established Mobile Money Interoperability*, available at <https://bit.ly/2H1UI0r>. This author was the legal and regulatory consultant on the IFC project.

¹⁸² The Alliance for Financial Inclusion (AFI) is a peer body of global financial regulators and DFS market participants. It holds regional workshops and an annual global policy forum. See <https://www.afi-global.org/>

¹⁸³ Such as through their establishment statutes, a method used in relation to LONOs.

¹⁸⁴ As occurred in Uganda, described above.

¹⁸⁵ Kenya’s high court for example struck down a legal amendment as part of the omnibus Statute Law (Miscellaneous) Amendment Act that required the NTA to consult the Competition Authority of Kenya before punishing any operator for abuse of dominance. The court ruling restored these powers to the NTA. See Telegography (2017) *Court Restores Market Dominance Powers to CA of Kenya*, available at <https://bit.ly/2ssQIkj>

¹⁸⁶ For more insights into the use of sandboxes for developing countries, see Wechsler, M; Perlman, L and Gurung, N (2018) *The State of Regulatory Sandboxes in Developing Countries*, available at www.dfsobservatory.com

¹⁸⁷ See **Section 2.3.1**

instructions. An overarching coordinating body – such as a national financial inclusion secretariat, agency or ministry – may also be established.¹⁸⁸ Often the CB will have its own financial inclusion department.¹⁸⁹

There is a growing use of innovative technology for compliance and regulatory purposes by regulators and the entities they supervise, manifesting in the relatively new but rapidly evolving field of ‘regtech’ – or ‘regulatory technology.’ Initial uses of regtech have revolved around use by market participants such as financial institutions, and emerging fintech companies to reduce compliance costs by automating typically manual information gathering and reporting processes. For regulators, regtech may improve their efficiencies by automating components of their supervisory and regulatory tasks while significantly enhancing their internal reporting processes. Understanding and then adoption of regtech can however be challenging in many developing countries that have technology and capacity constraints. Even though the goal may be to introduce and use regtech solutions, legacy internal processes, lack of policy insights and lack of capacity may in of themselves handicap this goal.¹⁹⁰

Exhibit 7: Use of Regulatory Technology – ‘regtech’ – for Financial Inclusion Purposes

2.6.4.4 Aspects of a Foundational DFS Enabling and Proportional Regulatory Environment

What is known as an ‘enabling environment’ for DFS may relate to an activity of appropriate regulators to set down conditions for participation in a sector, but may also relate to the legal ability (enablement) of the regulator itself to produce any enabling laws for market participants in the DFS ecosystem.¹⁹¹

‘Enabling and Proportional’ Licensing: The watchwords in respect of DFS and financial inclusion have involved the terms *enabling* and *proportional* regulatory regimes, generally referring to a regulator creating *ex ante* regulations¹⁹² and an environment that allows for the entry of new – usually non-bank – market participants to provide innovative solutions for financial inclusion.¹⁹³ Many supranational bodies have championed an ‘enabling and proportional’ approach to regulatory enablement for DFS. For example, ‘Principle 3’ of the G20’s ‘High-Level Principles for Digital Financial Inclusion’ of 2016 encourages regulators to:

¹⁸⁸ See for example *Banca de las Oportunidades*, a program to enhance financial inclusion in Colombia run by the Bank for Foreign Trade, Bancoldex. See Banca de las Oportunidades (2018) *Who We Are*, available at <https://bit.ly/2ymk8Xy>. Nigeria’s National Financial Inclusion Strategy mandated the creation of a ‘Financial Inclusion Secretariat’ supervised by the Financial Services Regulation Coordinating Committee, which reports to the National Economic Council. See CBN (2018) *Financial Inclusion*, available at <https://www.cbn.gov.ng/devfin/fininc.asp>; See also World Bank (2018) *National Financial Inclusion Strategies Resource Center*, available at <https://bit.ly/2D2ur4l>; World Bank (2015) *Overview: National Financial Inclusion Strategies*, available at <https://bit.ly/2LXjB0m>

¹⁸⁹ Jordan for example has a financial inclusion department overseeing the implementation and use of its JoMoPay switch.

¹⁹⁰ For further insights into the use of regtech use by central banks, see Perlman, L & Gurung, N (2018) *Use of Regtech by CBs and its Impact on Financial Inclusion*, available at www.dfsobservatory.com

¹⁹¹ See further **Section 2.5.5.2** on Factors and Components in Regulatory Development.

¹⁹² A CGAP report of 2008 of 7 jurisdictions of what was then commonly known as ‘branchless banking’ but which is functionally equivalent to what we call today DFS, scored the enablers to be (i) the authorization to use retail agents and (ii) risk-based AML/CFT rules as necessary, but not sufficient, preconditions for inclusive DFS, and classified several others as “next generation” issues, including (iii) regulatory space for the issuance of e-money particularly by nonbanks; (iv) effective consumer protection; and (v) policies governing competition. See Lyman, T, Pickens, M & Porteous, D (2008) *Regulating Transformational Branchless Banking*, available at <https://bit.ly/2LORgdn>

¹⁹³ For a distinction within financial sector between *ex ante* and *ex post* regulation, see CDG (2016) *Financial Regulations for Improving Financial Inclusion*, available at <https://bit.ly/2shcPL9>

‘Provide an enabling and proportionate legal and regulatory framework for digital financial inclusion, taking into account relevant G20 and international standard setting body standards and guidance.’¹⁹⁴

Lawmakers and regulators then usually craft rules that allow these new market participants, at a regulatory level ‘proportional to’ – that is, commensurate with - the perceived risk of allowing that new participant, to provide services. Generally, according to the FATF RBA, if the user and the services they use reflect comparatively less risk, then surrounding regulations – especially for CIV process – may also be relaxed.

At a more granular level, an *ex ante* ‘enabling environment’ has evolved marginally from initial implementations thereof to now address¹⁹⁵ whether there is:

- Defined, transparent and predictable rules and regulations
- Functional,¹⁹⁶ non-discriminatory approach to regulation that facilitates non-banks¹⁹⁷ being able to offer payment services and undertake e-money issuance as EMIs
- Support of a risk based approach (RBA) to CIV and Customer Due Diligence (CDD) based on FATF principles; and
- Consumer protection that involves consumer redress mechanisms and safeguarding of customer funds placed with DFSPs and banks as custodians of DFSP funds.

How these regulations are formulated is also a measure of how enabling they are. That is, regulations should establish a fair, non-discriminatory - and open - level playing field for market participants where similar rules apply for functionally similar services regardless whether or not the provider of these DFS is a bank, an MNO, or another DFSP. As noted above, this new approach to regulation is known – as noted above - as the *functional* approach, a pivot from the traditional *institutional* approach to regulation of DFS that in effect only allowed licensed banks to

¹⁹⁴ G20 (2016) *High-Level Principles for Digital Financial Inclusion*, available at <https://bit.ly/2c9V0WB>

¹⁹⁵ These ‘updated’ criteria to determine whether a jurisdiction is enabling were identified by CGAP in an important 2018 DFS regulatory study. The authors see these criteria though as basic, but not sufficient for enabling DFS. See Staschen, S & Meagher, P (2018) *Basic Regulatory Enablers for Digital Financial Services*, available at <https://bit.ly/2xmi8y2>. They compare their identified enabling criteria to that of the GSMA, UNSW and CDG. The GSMA criteria for what it terms ‘mobile money’ is considered enabling if (i) nonbanks are permitted to issue e-money; (ii) capital requirements are proportional to the risks of the e-money business; and (iii) mobile money providers may use agents for cash-in and cash-out operations. See di Castri, S (2013) *Mobile Money: Enabling Regulatory Solutions*, available at <https://bit.ly/2kGPgqX>

¹⁹⁶ Non-discrimination may refer to not just applying a functional approach to regulation, but to allowing international fintechs to provide services be on par with local players. Constructive barriers may include local ownership criteria, localization criteria requiring servers to be housed in the licensing country, and well as required references from local partners vouching for the international entrant. Similarly, entities owned in full or partly by the state may be given unfair access or pricing. For a discussion on barriers to entry, see ITU DFS FG (2017) *Interoperability*, available at <https://bit.ly/2LfZv0N>

¹⁹⁷ This may also include banks, although banks mostly have *de jure* ability to undertake these activities due to the omnibus nature of bank licensing regimes. In some countries – such as Colombia, Ghana, and Rwanda - banks require authorization/approval by the CB to offer separate e-money accounts as an additional product. Another exception are specialized ‘payment banks’ introduced the Reserve Bank of India in 2015. These are specialized financial entities for provision of DFS and related transactions. Credit and interest is not provided to customers. The first Payment Banks are operated by entities linked to MNOs, for example Airtel Payments Bank. See www.airtel.in/money. See Kumar, K & Raman, A (2015) *Did India’s CB get Payments Bank Approvals Right?*, available at <https://bit.ly/2stdae7>. In Bangladesh, even though non-banks cannot independently provide DFS, they can however provide DFS by partnering with banks as shareholders of a bank subsidiary that provides DFS.

provide financial services under a bank license regime. The latter scheme is known as a bank-centric (also known as ‘bank-led’)¹⁹⁸ model of DFS and is said to be ‘non-enabling.’¹⁹⁹

Many of the less or non-enabling rationales are rooted in combinations of the political economy in the country where traditional institutional thinking is engrained in political considerations,²⁰⁰ regulatory capture where banks successfully lobby their regulators to restrict non-banks from providing bank-like (non-credit) services.²⁰¹ Similarly, on the assumption that different providers do not necessarily entail the same risks.²⁰² The regulatory journey then to an ‘enabling’ environment, though, has featured some interesting carve-outs that often represent the local political economy, for example, allowing all non-banks except MNOs to provide DFS²⁰³ or requiring formation of specific financial entity vehicles to provide DFS.²⁰⁴ Restrictions on independent, direct provision of DFS by non-bank DFSPs without a mandated (and thus effectively ‘non-enabling’) need to partner with a licensed bank to provide DFS still exists in some markets but are increasingly becoming the exception.²⁰⁵

AML-related Provisions: CDD requirements often act as barriers to financial access for the poor, especially in environments where there is no national ID or where IDs are hard to obtain. FATF’s RBA to AML in DFS²⁰⁶ has allowed some, but not all, relaxation of ID requirements for CIV purposes.²⁰⁷ This is especially so where money laundering (ML)/terrorism financing (TF) risks have been assessed to be relatively lower for financial products and services in so far as they provide appropriately-defined and limited services to certain types of customers.²⁰⁸ Because DFS involves lower transactional value and volumes,²⁰⁹ it may be styled as ‘low risk’ compared to that for opening and use of bank accounts (as higher risk) where regular, large-value transactions can take place, often across borders. The RBA concept then has resulted in what is known as a ‘tiered’²¹⁰ CDD approach in DFS: where the ML risk is assessed to be low, there are lower CIV processes. The more ID and authentication of ID provided by a customer,

¹⁹⁸ The notion of a licensed bank being the primary pivot (by regulation) in DFS provision – originally termed ‘bank-led’ - was introduced in CGAP’s 2008 study of what was then commonly known as ‘branchless banking.’ See Lyman, T, Pickens, M & Porteous, D (2008) *Regulating Transformational Branchless Banking*, available at <https://bit.ly/2LORgdn>

¹⁹⁹ See di Castri, S (2013) *Mobile Money: enabling Regulatory Solutions*, available at <https://bit.ly/2kGPgqX> . The non-bank DFSP may be restricted from providing any DFS services other than as a supportive agent network for a bank.

²⁰⁰ For example in Moldova, where the author has seen very little political will to embrace DFS-type activities. Some politicians in Uganda have (unsuccessfully) to date, tried to foreclose on the ability of non-bank DFSPs to provide services. Daily Monitor (2017) *MPs pin BoU on unregulated mobile money transactions*, available at <https://bit.ly/2AvvuaA> ; and Blizz Uganda (2018) *MP drags MTN, UCC and Bank of Uganda to Court, Seeks an Injunction against MTN License Renewal*, available at <https://go.shr.lc/2Smqr3x>

²⁰¹ There is anecdotal evidence of this happening in developing and emerging economies. In Kenya soon after the launched of Safaricom’s M-PESA, major banks approached the Minister of Finance to shut down M-PESA, accusing it of being a Ponzi scheme. The minister reportedly approached the central bank on their behalf, but clearly the approach had no effect. On regulatory capture in banking in the US, see Igan, D & Lambert, T (2018) *Bank Lobbying: Regulatory Capture and Beyond*, available <https://ssrn.com/abstract=3128829>

²⁰² See CDG (2016) *Financial Regulations for Improving Financial Inclusion*, available at <https://bit.ly/2shcPL9>

²⁰³ For example in Nigeria where MNOs to date have not been allowed to directly offer DFS, instead allowed only to provide frontline agent CICO and sign-up services. This now appears to be changing in favor of a full enabling environment with the advent of ‘Payment Services Banks.’ See Tech Point (2018) *CBN Oks Telecom Operators For Payment System In New MoU*, available at <https://bit.ly/2qnGCjE>

²⁰⁴ For example the need in India noted above for MNOs to form ‘Payment Banks’ to provide services.

²⁰⁵ Liberia, Ghana, Colombia and possibly also Nigeria have or are moving away from the bank-centric model of DFS provision.

²⁰⁶ FATF (2017) *Anti-Money Laundering and Terrorist Financing Measures and Financial Inclusion with a Supplement on Customer Due Diligence*, available at <https://bit.ly/2taubZM>

²⁰⁷ See on IDs and CIV, **Section 2.5.4.1** above.

²⁰⁸ FATF (2013) *Guidance For A Risk-Based Approach Prepaid Cards, Mobile Payments And Internet-Based Payment Services*, available at <https://bit.ly/2jEAiAl>

²⁰⁹ MicroSave (2017) *Progress and Challenges with KYC and Digital ID*, available at <https://bit.ly/2teQXAN>

²¹⁰ Also called a progressive approach.

the higher their tier to allow them to store more in their SVA and undertake higher value and more frequent transactions.

The RBA principles are usually set at a national level by a FIU, then often codified as ‘Tiers’ by the CB as rules for DFSPs to follow, and then implemented by the DFSP. CDD usually also applies to agents. And depending on the risk profile of the customer and the service they are using, even ‘lighter’ CDD process may be allowed: known as Simplified CDD (SDD).²¹¹ SDD allows access to the basic, first level sets of DFS using just minimum identification.²¹² Some countries have implemented SDD practices in lower risk cases that successfully align financial integrity and financial inclusion policy objectives.²¹³ In 2015 in Peru for example, SDD measures were authorized by the banking supervisor (SBS)²¹⁴ for specific product and services. Providing only the national ID number is sufficient for opening a basic DFS account.²¹⁵

2.7 Role of Donors and Supporting Organizations

Many of the initiatives describe above to catalyze DFS in emerging and developing markets have been supported by a number of donors, supporting organizations, implementation partners and those engaged in capacity building. Donors – mostly philanthropic organizations, corporate foundations, and some G20-member government aid bodies – provide critical funding and thought leadership, and often direct technical assistance

²¹¹ SDD is characterized by a simplified CDD process for customers with a low risk profile. Less information or less robust verification of the customer’s identity and their intentions behind the business relationship may be required or verification may be postponed. It can ease difficulties for people to access financial services. FATF (2014) *Guidance for Risk-based Approach: The Banking Sector*, available at <https://bit.ly/1thpYyY>. The 2017 FATF *Supplement* provides country examples of simplified CDD (SDD) measures adapted to the context of financial inclusion. Those examples illustrate how SDD can support both financial inclusion and financial integrity policy objectives, especially where supported by alternative forms of identity verification, for example the use of e-identity tools. See FATF (2017) *Guidance On AML/CFT Measures and Financial Inclusion, With A Supplement on Customer Due Diligence*, available at <https://bit.ly/2wLMObN>

²¹² FATF (2017) *ibid*

²¹³ South Africa in 2008 implemented an SDD for banks providing low value products. Known as ‘Exemption 17,’ it was intended to simplify identification and verification requirements for low value products. It was withdrawn in 2017 ostensibly because SDD-type procedures are included implicitly in the modifications to AML legislation which requires a risk-based approach that allows an accountable institution to determine which business relationships or transactions pose a lower ML/TF risk and apply the necessary CDD requirements as described in the institution’s risk management and compliance policies. See FIU (2017) *Draft Withdrawal Notice Of Exemptions In Terms Of Financial Intelligence Centre Act, 2001, Published For Public Comment*, available at <https://bit.ly/2Pg8aG4>

²¹⁴ La Superintendencia de Banca, Seguros

²¹⁵ Providers had only to collect the full name, type and number of ID document of the customer, with the verification done though the National ID or passport for foreigners. The conventional CDD involved provision of their nationality, residence, phone number and/or e-mail address, occupation and name of employer of that person. SBS Resolution N° 2660-2015 implemented the integral risk management system for enterprises under the supervision of the SBS. This Resolution is applicable to all banking and financial institutions under the scope of the SBS. See PwC (2016) *Know Your Customer: Quick Reference. Guide*, available at <https://pwc.to/2ijumjA>

Name	Donor	International Body	Capacity Building	Implementation Partner
AFI			Yes	Yes
AFR			Yes	Yes
Bill & Melinda Gates Foundation	Yes			
Cambridge Centre			Yes	
CENFRI			Yes	
CGAP			Yes	Yes
Columbia DFSO			Yes	
DFID	Yes			Yes
Financial Sector Deepening				Yes
Fletcher School			Yes	
GIZ	Yes		Yes	Yes
GPIFI		Yes		
International Finance Corporation	Yes	Yes		Yes
Mastercard Foundation	Yes			
MEFMI				Yes
Mercy Corps				
Mercy Corps				Yes
Metlife Foundation	Yes			
Microsave				Yes
Omidyar Network	Yes			Yes
Rockefeller Foundation/Advisors	Yes			Yes
Toronto Centre				
UNCDF			Yes	
UNDP	Yes	Yes		Yes
UNSGSA		Yes		
USAID	Yes			Yes
World Bank	Yes	Yes	Yes	Yes

Exhibit 8: Role of selected donors, international bodies and implementation partners in the development of DFS ecosystems worldwide. Note that IFC and the Bill & Melinda Gates Foundation act as donors and investors in DFS-related companies.²¹⁶

3 Selected DFS Results and Challenges So Far

3.1 Overall Ecosystem

The GSMA reports that as of October 2018, there were 276 DFS offerings live in 90 countries,²¹⁷ providing DFS to some 690 million people, many of whom live in rural areas.²¹⁸ There were 5.3 million registered agents²¹⁹ and some USD 1.8 billion in transactions done over the reporting period. The IMF reported in its Financial Activity Survey (FAS) in October 2018 that on average, the number of DFS-type accounts in a low-income economy is more than

²¹⁶ Some data in this **Exhibit** is derived from CGAP (2018) *Donors and Investors*, available at <https://www.cgap.org/topics/donors-investors#.W9IrLXuDObo.twitter>

²¹⁷ GSMA (2018) *2017 State of the Industry Report on Mobile Money*, available at <https://bit.ly/2CKPLqF>

²¹⁸ *ibid*

²¹⁹ It is not clear if these refer to individual agents and also super- and/or master-agents. GSMA (2018) *2017 State of the Industry Report on Mobile Money*, available at <https://bit.ly/2CKPL>

twice the number of bank accounts per 1,000 adults.²²⁰ The IMF’s FAS data also confirms that low-income countries are leading the way in DFS adoption.

But as noted below, customer and agent activity is however very low. Interoperable schemes though are growing and morphing into full integration into national payment systems and growing numbers of e-government services. A number of countries have also recently implemented eKYC systems for CIV purposes.

3.2 Effect of DFS-related Regulatory Regimes:

3.2.1 Licensing

Ultimately all these regulatory efforts should percolate into actionable regulations and laws.²²¹ As noted above, four broad types of DFS operational models have evolved through regulation and policy.

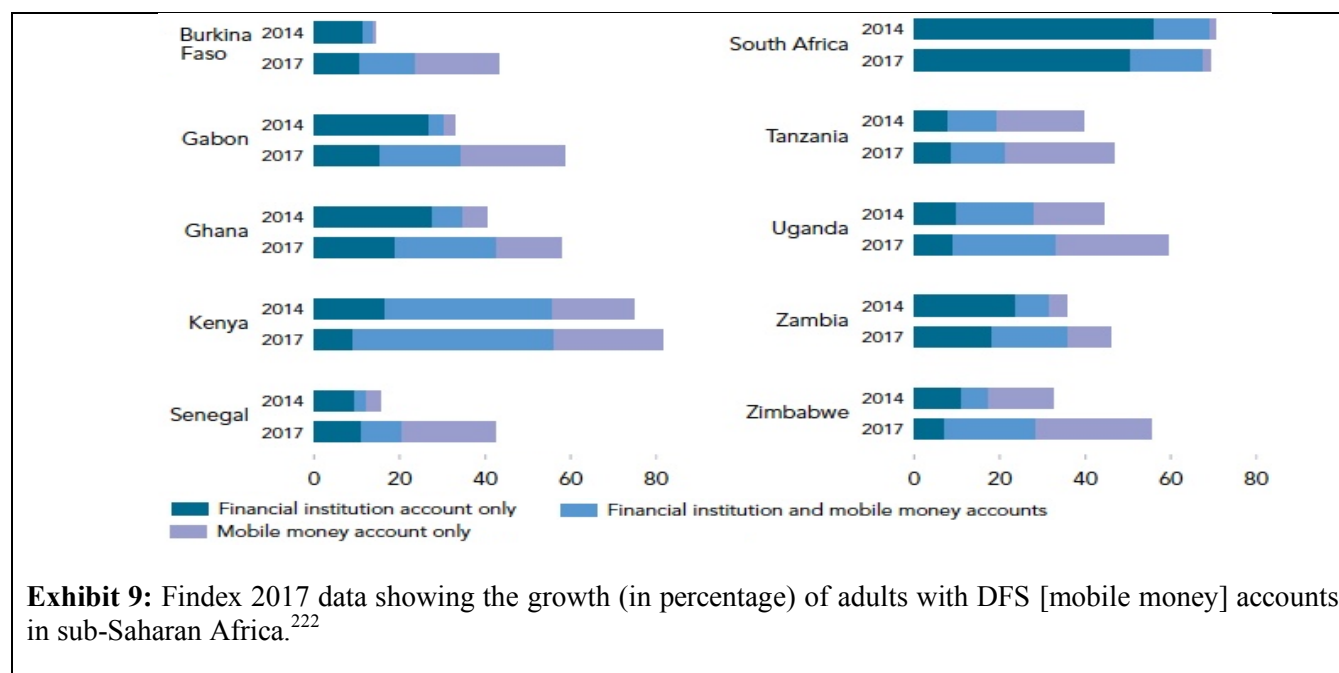


Exhibit 9: Findex 2017 data showing the growth (in percentage) of adults with DFS [mobile money] accounts in sub-Saharan Africa.²²²

Again, while reasons are more complex than a simple binary ‘enabling’ or ‘non-enabling’ and that each of these models have their own complexities and challenges and varying success and efficacy for financial inclusion, globally it is the non-bank-only DFS model²²³ that appears to be the most successful, simply because they are able to serve the ‘unbanked’ population in (rural) areas that banks were unwilling to pursue. Of these, data suggests that open licensing regimes for DFS provision are the most ‘enabling.’

²²⁰ IMF (2018) *IMF Releases the 2018 Financial Access Survey*, available at <https://bit.ly/2AoLKKv>

²²¹ In Uganda however, an ‘enabling’ national payments law has been in the works since the 2000s. The DFS ecosystem is reliant on LONOs, which have been challenged in court.

²²² World Bank Group (2018) *The Global Findex Database 2017*, available at <https://globalfindex.worldbank.org/>

²²³ The majority of the non-banks providing DFS are MNOs.

	2011	2014	2017
Colombia	30%	39%	46%
Ghana	29%	41%	58%
Liberia	19%	No data	36%
Nigeria	30%	44%	40%

Accounts (% age 15+)

Exhibit 10: World Bank Findex 2017²²⁴ comparative data showing account growth of DFS markets using enabling or non-enabling regimes. Boxes in black show the bank-centric regulatory regime for DFS. Boxes in gray show an open, enabling regime for DFS.

For example, while more indicative than conclusive of these transitions, the World Bank Findex 2017 comparative data shows larger growth of DFS markets where an enabling regulatory regime is employed by regulators.²²⁵ For example, Ghana and Colombia transitioned from bank-only approaches, as did India which in 2015 launched a ‘Payment Bank’ approach.²²⁶ **Exhibit 10** also suggests that the CB of Nigeria’s (CBN) long-standing prohibition on MNOs providing DFS may be the primary reason for low volumes of DFS use in Nigeria and high rates of financial exclusion.²²⁷ The CBN though is reportedly now on a journey to a ‘Payment Service Bank’ approach.²²⁸

3.2.2 Taxation

A number of countries – many recently in East and Southern Africa – introduced significant taxes on DFS and general payment transactions as well as on data mobile charges and social media use.²²⁹ These taxes are expected to have a largely dampening effect on DFS usage. In Uganda in particular, implementation of a tax on DFS transactions in mid-2018 led to an immediate decline in DFS transaction volume, with a drop at MNO Airtel of 33%. The controversial tax was initially set at 1% but after a public outcry about the tax itself and a procedural anomaly in the amount set, it was reduced to 0.5% and only applicable to withdrawals.²³⁰ Taxes were also introduced on social media use.²³¹ The Bank of Uganda had initially pushed back²³² on any taxes on transactions

²²⁴ World Bank Group (2018) *The Global Findex Database 2017*, available at <https://globalfindex.worldbank.org/>

²²⁵ *ibid*

²²⁶ Payment Banks are financial inclusion-focused, providing a limited amount of services such as small savings accounts, payments and remittance services to migrant labour workforce, low income households, small businesses, other unorganized sector entities and other users. They cannot accept fixed or recurring deposits and in for savings accounts, the maximum deposit is USD 1,364. The central bank gave in-principle approval to 11 entities to start payments bank. Airtel Payments Bank was the first one to launch, with Paytm Payments Bank, Fino Payments Bank and Aditya Birla Payments Bank are also operational. See Livemint (2018) *How payments banks are different from regular banks*, available at <https://bit.ly/2Je1Euf>

²²⁷ Leadership NGA (2018) *NCC, CBN Sign MoU On Mobile Money, Financial Inclusion*, available at <https://bit.ly/2JAqRP8>

²²⁸ See ProShare (2018) *CBN Publishes Guidelines For Licensing and Regulation of Payment Service Banks in Nigeria*, available at <https://www.proshareng.com/news/42108>

²²⁹ See generally on the taxes and their impact, Muthiora, N & Raithatha, R (2017) *Rethinking mobile money taxation*, available at <https://bit.ly/2IyvAmF>

²³⁰ Uganda Business News (2018) *Museveni calls 1% mobile money tax a mistake, orders for refund of deductions*, available at <https://bit.ly/2y154Bo>; Kapo, N B (2018) *Forget Mobile Money tax refund, the 1% was already spent- Gov’t*, available at <https://bit.ly/2D9PhyY>; Africa News (2018) *Uganda removes taxes on 'depositing and sending' mobile money*, available at <https://bit.ly/2qaP7Pj>; and Bitcoin.com (2018) *Wave of Mobile Tax Hikes Squeeze Africa's Poor to Indulge Governments*, available at <https://bit.ly/2CKMwTX>

²³¹ The taxes require daily payment of 200 Ugandan shillings (USD 0.05) to enable use of Facebook, WhatsApp, and Twitter.

²³² Observer Uganda (2018) *Telecoms, Bank of Uganda want mobile money tax scrapped*, available at <https://bit.ly/2ERMOuI>

but later dropped its objections when the tax was lowered. In Kenya in mid-2018, a tax was placed on fees charged on money transfers by banks, agencies, and other financial providers, increasing it from 12% to 20%.²³³ There is also a proposed tax of 0.05% for transfers of Sh 500,000 (around USD 5,000) or more sent through banks or other financial institutions. A court has however suspended the implementation of the tax. In Tanzania, there is a 10% excise duty for sending and withdrawing money using DFS.²³⁴ In Zimbabwe, taxes were increased in July 2018 on DFS transfers to effectively USD 0.02 for every dollar transacted.²³⁵ If the 2% on every dollar is applied, state coffers will reportedly get a boost of USD 1.28 billion. In Nigeria, Nigeria is seeking about USD 2 billion in back taxes from MTN,²³⁶ another potentially devastating blow to its commercial viability.

3.2.3 Ecosystem Activity Levels

DFSPs: The DFS ecosystem is relatively new and is still evolving. Starting and maintaining a DFSP is costly and involves new technical systems, internal process, treasury management, and new compliance requirements that DFSPs – even for established MNOs – have to finance and maintain. Agent networks are often the most expensive components for a DFSP’s activities, especially as it involves training, liquidity management and in some cases, security.²³⁷ The GSMA says that margins in the payments business are being squeezed by both increased competition and a downward pressure on fee-based revenue in particularly a squeeze on margins in both EMEA and North America.²³⁸ There are also other disruptive players – particularly those using QR codes for merchant payments – such as Alipay and SnapCash.²³⁹

Some DFSPs have closed down or, as is often characterized as being the result of ‘consolidation’ of their MNO parents. DFSP closures occurred recently in Rwanda,²⁴⁰ Ghana,²⁴¹ and South Africa.²⁴² Airtel in Kenya²⁴³ has said often its operations there are unprofitable and affect the viability of its telecommunications and DFS activities, although with the advent of interoperability and frequency expansion in Kenya, closure of its operations appears less likely.

²³³ This will reportedly also apply to statement requests, monthly account fees, and new debit cards. / As an amendment to the Excise Duty Act of 2015. See Bitcoin KE (2018) *A Look at the New Tax on Mobile Money and Banking in Kenya and Existing Alternatives*, available at <https://bit.ly/2AqXz2O>; and Bitcoin.com (2018) *Wave of Mobile Tax Hikes Squeeze Africa’s Poor to Indulge Governments*, available at <https://bit.ly/2CKMwTX>

²³⁴ GSMA (2017) *Taxation and mobile money in Tanzania*, available at <https://bit.ly/2EKN3aU>

²³⁵ In 2016, a 5% health tax was levied on airtime and mobile internet top-ups. See ITWeb Africa (2018) *Zimbabwe slaps tax on mobile money, online transactions*, available at <https://bit.ly/2PUptQF> ; and Bitcoin.com (2018) *Wave of Mobile Tax Hikes Squeeze Africa’s Poor to Indulge Governments*, available <https://bit.ly/2CKMwTX>

²³⁶ The Nigerian government also ordered MTN to refund some USD 8.1 billion in what it said was from illegally repatriated funds. Bloomberg (2018) *MTN says Nigeria is seeking to recover \$2 billion in back taxes*, available at <https://bloom.bg/2CprlTo>

²³⁷ Mobile World Live (2018) *Ghana to step up mobile money regulation*, available at <https://mwl.me/2RljbDI>

²³⁸ In Bangladesh, MNOs have complained that the value they receive for USSD use in DFS by banks and DFSPs is unprofitable. The NTA and CB have different views on whether to increase USSD pricing for DFS, with the NTA siding with MNOs, while the CB says pricing should reflect financial inclusion priorities. The NTA pricing proposal submitted to government is four times higher than the proposal of the central bank. Daily Sun (2018) *Session-based USSD price to raise mobile banking cost*, available at <https://bit.ly/2z7uGHm>

²³⁹ The GSMA also say that government-backed programs can exert a downward pressure on pricing.

²⁴⁰ Airtel (2018) *Airtel Appoints New MD to Run the Combined Entity in Rwanda*, available at <https://bit.ly/2D77o8H>

²⁴¹ Reuters (2017) *Bharti Airtel and Millicom announce deal closure to combine operations in Ghana*, available at <https://reut.rs/2idQxYJ>

²⁴² Tech Financials (2017) *MTN versus Vodacom – Who is the Biggest Provider of Mobile Money in Africa?*, available at <https://bit.ly/2qe2ZIA>

²⁴³ Capital FM (2017) *Airtel not exiting Kenya but looking to consolidate operations*, available at <https://bit.ly/2OcPxxQ>

Customers: Activity level reports at a high-level vary and depend on the reporting agency, be it the data from the World Bank Findex,²⁴⁴ the IMF,²⁴⁵ or the GSMA and its annual SoTIR.²⁴⁶ Whatever the source though, trend lines show large inactivity levels. Data from the World Bank’s 2017 Findex Survey suggest that while DFS accounts have grown from 2014,²⁴⁷ activity levels have fallen.²⁴⁸ Analysis from the Center for Financial Inclusion at Accion of Findex data found that roughly half of the new accounts — nearly 235 million — have not been used in the last year. The number of active account holders only increased by 285 million, much less than the overall growth, they say, in account ownership from 2011–2014. Similar trend lines have been reported by the GSMA, whose SoTIR 2017²⁴⁹ highlighted that of the 690 million ‘mobile money’ accounts opened, active account use within a 90 day period was at disappointing 35.8% and active account use within a 30 day period at a worrying 24.3%.

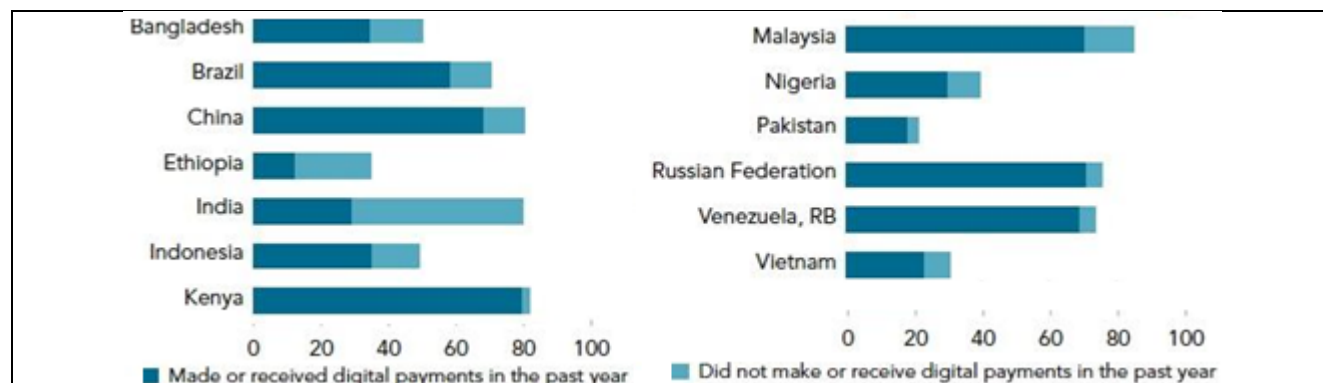


Exhibit 11: Adults with accounts percentage use. World Bank Findex 2017 data showing shares of account owners using ‘digital payments.’²⁵⁰ There are significant variations across developing countries.²⁵¹

Agents: GSMA report that agent activity globally is also at 54.7%.²⁵²

3.2.4 Service Bouquet Expansion

As DFS becomes more embedded in a country’s financial ecosystem and in the daily activities of customers, more service and permutations of access and use have evolved. These include integration into merchant payments and ability to send value across networks and systems. Similarly, the mobile phone and DFS systems are moving from standalone, to interoperability, and now increasingly into national switches, providing an opportunity for a fully ubiquitous (national) payment system. Catalyzing this in many respects are e-government services, where taxes, electricity, water, fines and many others can be paid directly from a mobile phone-based DFS SVA. DFS is also

²⁴⁴ See Accion-CFI (2018) *Financial Inclusion Hype vs. Reality: Deconstructing the 2017 Findex Results*, available at <https://bit.ly/2JAYB3n>

²⁴⁵ IMF (2018) *IMF Releases the 2018 Financial Access Survey*, available at <https://bit.ly/2AoLKKv>

²⁴⁶ GSMA (2018) *2017 State of the Industry Report on Mobile Money*, available at <https://bit.ly/2CKPLqF>

²⁴⁷ Some 515 million new financial accounts were opened around the world. World Bank Group (2018) *The Global Findex Database 2017*, available at <https://globalfindex.worldbank.org/>

²⁴⁸ See Accion-CFI (2018) *Financial Inclusion Hype vs. Reality: Deconstructing the 2017 Findex Results*, available at <https://bit.ly/2JAYB3n>

²⁴⁹ GSMA (2018) *2017 State of the Industry Report on Mobile Money*, available at <https://bit.ly/2CKPLqF>

²⁵⁰ Findex refers to digital payments as ‘using mobile money, a debit or credit card, or a mobile phone to make a payment from an account, or report using the internet to pay bills or to buy something online.’

²⁵¹ World Bank Group (2018) *The Global Findex Database 2017*, available at <https://globalfindex.worldbank.org/>

²⁵² *ibid*

now an important tool in humanitarian crises responses,²⁵³ with disbursements paid directly into SVAs rather than only through cash or in-kind goods, and similarly for payments to crises responders.²⁵⁴

As the GSMA notes,²⁵⁵ MNOs (acting) as DFSPs may be able to expand or redefine their top-line growth by considering new ‘adjacent revenue streams’²⁵⁶ closely linked to their core payments product offerings and which extend beyond the traditional transaction fee-based revenue model. Many of these new service offerings – such as credit and investments – may however depend on regulatory approvals²⁵⁷ as they may potentially pose financial ecosystem and consumer risk. Credit, as noted above, is being offered by DFSPs in conjunction with banks. The most well-known mobile-centric credit product is M-Shwari, a savings and credit product provided by MNO Safaricom in Kenya to existing customers of its M-PESA DFSP with bank partner KCB.²⁵⁸ Multi-national MNO MTN in 2016 introduced its MoKash credit offering in Uganda and Zambia.²⁵⁹ Loans are financed by its lending partner, the Commercial Bank of Africa. The role of MTN is to market, originate and disburse the loans and collect the loan repayments using MTN Mobile Money. The use of customer CDRs for building credit scopes remains controversial however,²⁶⁰ while concerns raised about large increases in large-scale blacklisting of DFS customers using credit facilities offered on their mobile phone for the first time.²⁶¹

3.2.5 Interoperability of DFS Platforms

As noted above²⁶² on transaction ubiquity, a majority of DFS systems operate as walled gardens, meaning DFSPs only provide transactional and value transfer services to their own customers and do not allow transfer of value to other DFSPs. There is however a momentum towards interoperability of some sort, be it bilateral interoperability or effective integration into switches, allowing value to be transferred and spent ubiquitously. In 2017-2018 alone, interoperability initiatives have been introduced in Uganda, Malawi, Rwanda and Kenya. In most cases there is no additional fee for transactions to other DFSPs, although in some cases there may be fees for transfers to and from bank accounts.

3.2.6 Effect of AML and Security Concerns

National regulators take their AML policy cues from FATF, which in a 2017 Guidance²⁶³ endorsed the use of lower forms of CDD based on a risk assessment by DFSPs and regulators. DFS activity though is low, and in decline in some places. As noted above, while the reasons appear to be complex, one of the factors suggested for the decline may be restrictive CIV and KYC regulations that make it harder for customers to transact beyond a basic account

²⁵³ See Gurung, N & Perlman, L (2018) *The Role of Digital Financial Services in Humanitarian Crises Responses*, available at www.dfsobservatory.com

²⁵⁴ Kourgialis, J (2018) *Learning From Ebola: How Mobile Money Can Prevent Health Crises*, available at <https://bit.ly/2qbFwbh>

²⁵⁵ Gidvani, L and Shulist, J (2016) *Rethinking the mobile money business model to capitalise on adjacencies*, available at <https://bit.ly/2OSjqZX>

²⁵⁶ *ibid.* The GSMA define ‘adjacent revenue streams’ broadly, to include all opportunities where the (mobile money) service can leverage its key assets such as the agent distribution network, customer base, and/or customer transaction data, to offer new services to existing and new customers and businesses. These streams they say may include offering digital credit or simple investment products.

²⁵⁷ Reuters (2018) *Kenya's central bank governor calls for regulation of fintech lenders*, available at <https://reut.rs/2spyhgl>

²⁵⁸ M-Shwari is operated by M-PESA and KCB and facilitates access to micro credit loans of a minimum of KSHs.100 any time charged at a ‘facility fee’ of 7.5%. See Safaricom (2018) *M-Shwari & KCB M-PESA*, available at <https://bit.ly/2t5LpZL>

²⁵⁹ Tech Financials (2017) *MTN versus Vodacom – Who is the Biggest Provider of Mobile Money in Africa?*, available at <https://bit.ly/2qe2ZIA>

²⁶⁰ Blechman, J (2016) *Mobile Credit In Kenya And Tanzania: Emerging Regulatory Challenges In Consumer Protection, Credit Reporting And Use Of Customer Transactional Data*, available at <https://bit.ly/2x93hqE>

²⁶¹ Microsave (2017) *Is Digital Credit A Silver Bullet?*, available at <https://bit.ly/2CdhJMU>

²⁶² Section 2.5.4.2 on Transaction Processing Ubiquity

²⁶³ FATF (2017) *Anti-Money Laundering and Terrorist Financing Measures and Financial Inclusion with a Supplement on Customer Due Diligence*, available at <https://bit.ly/2taubZM>

level, or even to get access to a DFS account. In particular, AML-related restrictions on SIM card registrations, DFS use and phone use and use may also have a dampening effect on DFS use by even legitimately registered users. For example, and as noted above, lack of regulatory coordination between the ID-issuing authority, the NTA and the CB in Uganda resulted in millions of customers not being able to fully use their DFS accounts.

And then in July 2018, the NTA in Uganda banned the sale of airtime scratch cards by street vendors exclusively in favor of electronic sale points.²⁶⁴ In Bangladesh in October 2018, the NTA forced MNOs to obtain prior permission for selling SIM cards to corporate users.²⁶⁵ Similarly, anti-fraud initiatives by NTAs have resulted in mobile phones suspected of being fake or stolen being blacklisted from national use, resulting in lack of access to DFS.²⁶⁶ In 2016 in Nigeria, the NTA fined MNO MTN over SIM card registration violations.²⁶⁷

3.2.7 Competition Issues

Besides limiting progression to richer and more interactive DFS services and providing a poor UX, there are also downstream competition and security related effects of not expanding or enhancing beyond the 2G-only coverage. Specifically, access to DFS via existing 2G-based UIs may be restricted by competing MNOs who control critical USSD and STK gateways. With 2G-only coverage likely to be the default coverage for a number of years yet in rural areas in the developing world, competition issues are likely to manifest concurrently and will require regulatory intervention and not as it is often now, forbearance.²⁶⁸

3.2.8 Security Concerns

Security concerns relate to the inherent insecurity of 2G technologies, such as USSD in use for DFS provision, such their use as a primary UI poses risks to the security of the DFS ecosystem as is currently configured.²⁶⁹

²⁶⁴ All retailers had to return unused and unsold stock of airtime scratch cards for refunds. Flash Uganda Media (2018) *UCC issue final deadline for selling airtime scratch cards*, available at <https://bit.ly/2ONXW0u>. Also in Uganda, an unexpected directive from the President citing a ‘threat to national security’ just before the February 2016 national elections, MNOs had to shut down key social media sites and disable DFS platforms during voting, with users remaining without access to funds for nearly four days. See Bold, C & Pillai, R (2016) *The Impact of Shutting Down Mobile Money in Uganda*, available at <https://bit.ly/2CJEp9W>

²⁶⁵ Daily Star News (2018) *Corporate SIM sale now needs prior BTRC nod*, available at <https://bit.ly/2qaShmj>

²⁶⁶ In Tanzania in 2016, some 2 million phone were electronically barred from use on all networks following an instruction from the NTA. See All Africa (2016) *Two Million Fake Mobile Phones Blocked in Tanzania*, available at <https://bit.ly/2D7vCjf>

²⁶⁷ Vanguard News Nigeria (2018) *SIM fine: MTN pays N165bn out of N330bn – NCC*, available at <https://bit.ly/2RiE5TA>

²⁶⁸ See further, Perlman, L (2017c) *Competition Aspects of Digital Financial Services*, available at <https://bit.ly/2xxLcma>

²⁶⁹ On security of the USSD UI and bearer and the impact on DFS, see Butler, K; Perlman, L; & Makin, P *et al* (2017) *Security Aspects of Digital Financial Services (DFS)*, available at <https://bit.ly/2HH6Jtn>

4 Conclusions

We recognize that many countries where DFS has been established are still in the ‘ignition’ phase, although fewer jurisdictions have connections on the (foundational) enabling environment. This may be because of key learnings of the benefit of a foundational enabling environment where previous methods have not worked; the desire to evolve beyond foundational transactions components to a more integrated financial ecosystem where the type of instruments and storage matter less than in a means ultimately to providing national services; from peer, regional and international groupings and learnings – such as through AFI, ITU, and other donor-sponsored collegial events and organizations.

While there are encouraging numbers of account signups seen in the latest Findex data, account activity levels are worryingly low. This may be because of technical and literacy levels of users, with many preferring to conduct DFS activity as OTC transactions through local agents. Not only may these trends affect the viability of DFSPs, but it also has money laundering implications as these transactions largely cannot be tracked. Indeed, there has been a wave of consolidation of MNOs, many of whom act also as DFSPs. While smartphones use is growing, there is still a majority of feature phone and thus USSD as the User Interface use in DFS worldwide, and even growing in India. Competition-related issues regarding access to USSD gateways and pricing of access are still of concern to regulators who must balance commercial concerns against financial inclusion priorities, a true ‘regulator’s dilemma’.

We view the enabling environment criteria as still fundamentally focused on the foundational, transactional DFS 1.0 ecosystem. Rather, we believe some ‘ignition’ is required in thinking and writing as systems and transactions types become more complex – evolving to DF2.0 and beyond – as the differentiators between instruments, systems and participants decrease and the interactions between regulators, and between participants become more complex, we see these ‘foundational’ enablers as insufficient regulatory tools. For enabling DFS 2.0 and beyond, we see the need for cooperation between market participants to provide interoperable, or integrated services and improved mobile data coverage.

Hence, tracking the evolution of DFS (which itself tracks technology innovations), the enabling environment needs to evolve, and rapidly. Capacity, regulatory automation, and cooperation become part of this enablement, fitting into more of broad national strategy that include financial inclusion, electronic commerce, data protection, telecommunications, payment systems, banking, AI, investment schemes. Technology companies are rapidly lowering the barrier to entry to these facilities, often leaving sector regulators scrambling to understand the new technologies and facilities, but also exposing weaknesses in cooperation needed to enable these ecosystems.

Similarly, strict CIV relating to Anti Money Laundering concerns may hinder account signups. Financial integrity concerns must then be balanced against national financial inclusion agendas. New biometric IDs and eKYC systems being established in many developing countries may provide some solution to these CIV challenges. Similarly, evolving regtech solutions may assist many regulators in their compliance and supervisory challenges, potentially freeing up valuable regulatory capacity. Innovation can also be developed through embracing regulatory sandboxes to test new products in a controlled environment.

An important component of properly regulating the DFS ecosystem is the importance of collaboration between central banks, NTAs and competition authorities for them to understand each other’s markets and their feedback loop effects which should include exchanges of data and analysis where allowed. Donors, SSBs and implementation partners play an increasingly important part in peer exchanges between regulators, and between regulators and industry, as well as providing critical technical assistance.

Security concerns relate to the inherent insecurity of 2G technologies, such as USSD in use for DFS provision, such their use as a primary UI poses risks to the security of the DFS ecosystem as is currently configured.