GDDFI Discussion paper

DIGITAL FINANCIAL SERVICES: REGULATING FOR FINANCIAL INCLUSION

AN ICT PERSPECTIVE

Work in progress, for discussion purposes
Comments are welcome!
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Table of Contents

Figures

Tables

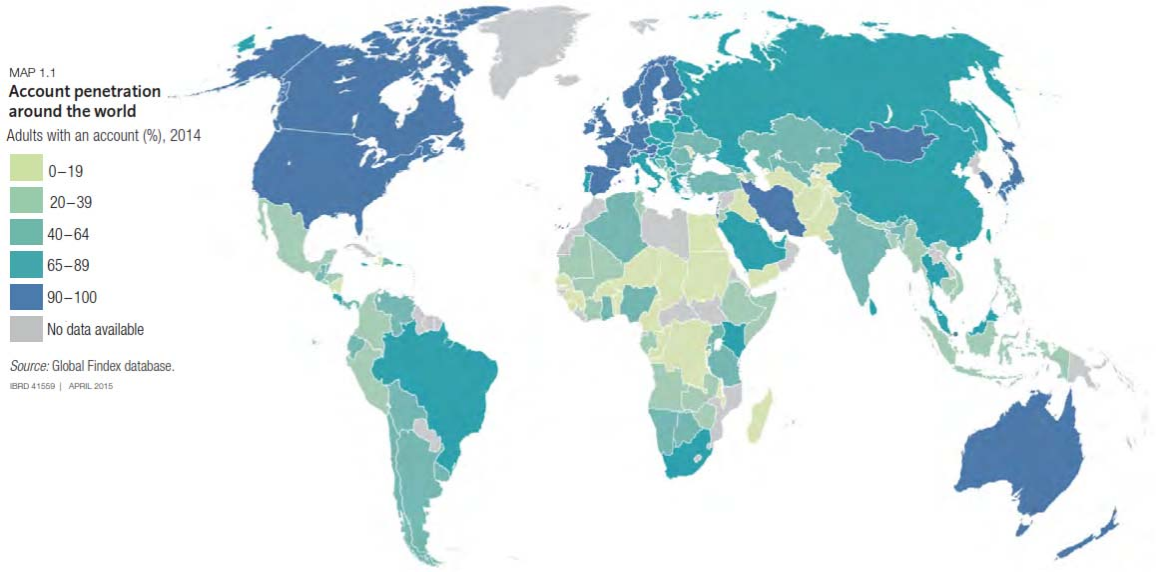
1 Introduction

Mobile financial services have become an important driver of financial inclusion in a growing number of countries. They are bringing finance to the 'unbanked', who have hitherto not had access to formal financial services – whether because they had no bank branches in their areas or services were just too expensive. Starting with mobile money wallets, used for transfers among subscribers, such services then developed to payment services, enabling bill payments by consumers to electricity, water and other utilities, schools and merchants. Innovation is enabling people not merely to store and transfer money, but even to borrow it – despite having no credit history.

Mobile financial services typically either ignite and grow rapidly, or don't grow much at all. In addition to the degree of financial exclusion, the rapid uptake of such services depends on the deployment of an agent network to allow customers to cash-in and cash-out. Just as important, however, are the regulatory barriers to entry and growth.[1] And once in full throttle, just as important to continued innovation and growth is competition.

Mobile financial services may be provided by mobile network operators (MNOs), as well as by banks and other providers that use the MNOs' network. Whether these are all allowed to enter the market, or whether only banks are permitted to provide such services, greatly influences whether the market will take off. After Philippines' early introduction of services, Bangladesh, Cote d'Ivoire, Guatemala, Kenya, Paraguay, Peru, Rwanda, Somaliland, Tanzania, Uganda and Zimbabwe have leapt forward in uptake of services, in part due to facilitative regulatory regimes.

Figure 1. Account penetration around the world



Source: Global Findex database 2014

Much depends on whether the financial regulators align entry restrictions with the low level of systemic risk involved in mobile transfers and payments, or instead impose the full weight

[1] Evans, D. and A. Pirchio (2015) 'An Empirical Examination of Why Mobile Money Schemes Ignite in Some Developing Countries but Flounder in Most', Coase-Sandor Institute for Law and Economics Working Paper no 723.

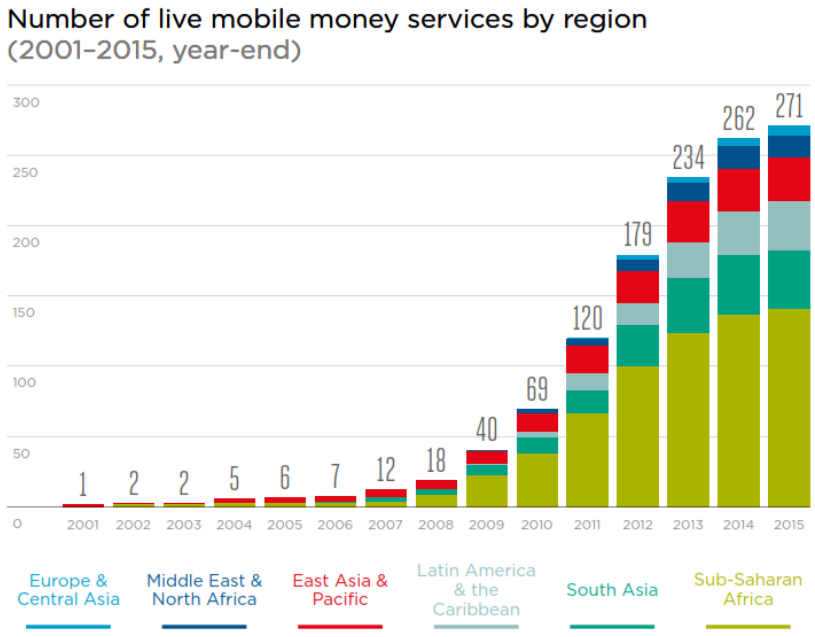
of banking regulation. Markets are more likely to thrive where MNOs are permitted to press ahead in offering such services. They already have a large customer base connected to the same extensive geographic telecommunications network over which mobile financial services will be provided, as well as a light-foot distribution system of agents.

The ability to recruit, train and deploy agents around the country is crucial for a 'two-sided platform' business composed of users on one side and agents on the other to attract sufficient numbers of each to reach viable scale. Then the 'network effects' kick in, providing greater utility to users because there are more and more people – and businesses and schools – in more and more places to whom they can send their money. Regulators have to judge how best to encourage the development of agent networks for mobile financial services at the same time as liberalising traditional banking through 'agent banking' (also referred to as 'branchless banking').

As usual in fast moving technology driven industries, the price of success is often new regulatory policy challenges. The same network effects that make it hard at the start to get the mobile financial services sector moving, and then enable it to take off and grow explosively, also carry a risk of concentrating market power in the leading providers.

Particularly where the leader already has significant market power in the mobile telecommunications services sector, the risk of creating a dominant mobile money platform is high. This risk is accentuated where powerful providers fend off rivals not merely through producing a better product at a better price, but through ongoing exclusive deals with agents, limiting access to the mobile networks, and the lack of interoperability among different mobile money platforms.

Figure 2. Growth in the number of mobile money services by region



Source: GSMA, 2015 State of the Industry Report: Mobile Money.

Regulators face tricky issues in working out what is innovation and investment and what is actually anticompetitive exclusionary behaviour, and whether to intervene or hope the market will resolve matters over time. For instance, in Indonesia, Pakistan, Peru and Tanzania, the MNOs have voluntarily established account-to-account interoperability. Egypt is currently

wrestling with interoperability issues, including integrating a mobile payments gateway into the banks' automated clearing house (ACH).[2]

As the services evolve beyond plain transfer and payment services into 'intermediation' between depositing and lending – putting money at risk – a suite of new regulatory issues arises. The relationship between the banks and MNOs and other providers has to be reconfigured, and new forms of partnerships among these are emerging.

In an unbanked market, the challenge of determining whether to lend (and if so, what amount for what duration, and at what interest rate) to people with no credit record is being met by analysing their mobile money behaviour patterns. By generating credit scores from algorithms applied to customers' mobile money transaction histories, MNOs are unlocking credit for population groups that never before had access to formal financial services. This also is creating new regulatory policy questions, as only the leading mobile money platforms have the transaction history data. Again, regulators must struggle with questions about where reward follows innovation and investment, and at what point a customer's data belongs to him or her, or should be available to would-be lenders other than the same mobile money provider.

All in all, exciting technological advances are producing electrifying results for financial inclusion, and promising to open doors out of poverty, but their success depends on a complex mix of regulatory policy issues many of which have little precedent.

The purpose of this paper is to shed light on some of the most important issues that policy makers and regulators face in accelerating the spread of mobile financial services, while ensuring that the market develops competitively rather than becoming beholden to a very small number of dominant players. It focuses on the issues that have most at stake and are the most pressing rather than trying to address every possible relevant regulatory or competition issue. In doing so, the paper aims to help regulators support the key contribution of ICT to digital financial inclusion using mobile networks, introducing those that are unbanked and underbanked into the digital economy.

Section 2 provides background to mobile financial services and their importance in driving financial inclusion. While there has been important progress, we are still very much at the start of the story, with many countries still to introduce such services, and far more yet to see them reach significant scale.

The World Bank has referred to mobile money as a 'success story' that is also a 'regulatory minefield.'[3] While section 2 celebrates the success to-date but suggests that most of the success is yet to come, section 3 turns to what is indeed something of a minefield. It is all too easy for regulation to impede growth in mobile financial services, or for the absence of well-judged and well-timed regulatory intervention to result in a market dominated by one player facing no meaningful competition.

The heart of the paper, Section 3, explores regulatory policy issues that are key to encourage initial growth and then make growth and ongoing competition and innovation sustainable:

- Section 3.1 begins by outlining the ***impact of regulation*** on whether the mobile financial services sector will take-off at all and whether it will become competitive.

[2] See http://blog.mondato.com/a-new-kind-of-egyptian-revolution/.

[3] World Bank, World Development Report 2016, available here.

- Turning then to the substantive regulatory issues, section 3.2 discusses ***prudential financial regulation***, including safeguarding user funds, protecting against fraud, terrorism financing and money laundering. This is chiefly the domain of the financial sector regulator, often the central bank. Countries are experimenting with different levels of regulation for different types of risk.
- Section 3.3 looks at the importance of the ***agent network***, and how to preserve the incentive for rapid rollout of agent networks without allowing exclusive arrangements to prevent competitors to enter the market successfully. These are matters where both the financial sector regulator and competition authority, if there is one, would naturally be involved.
- Section 3.4 examines the ***connectivity*** problem where MNOs are both providing mobile financial services and providing telecommunications network services to competitors. Experience shows that there is a serious risk that MNOs with their own mobile money service may set pricing and other conditions of access for key telecommunications network services in a manner that excludes rivals. This concern over vertical integration and control over a bottleneck resource for downstream competitors is 'meat and potatoes' in telecommunications regulation and competition law.
- Section 3.5 then explores the question of ***account-to-account interoperability***, meaning the ability to transfer funds from the mobile wallet account of one provider to that of another provider. This has important implications for network effects and prospects for competition.
- In section 3.6, the paper takes up the use and availability of ***customer data for risk-related financial services***, principally lending and insurance. This has implications for telecommunications regulators (as MNOs may have important relevant data), financial regulators (who want to ensure firms can manage risk appropriately) and competition regulators (who want to ensure all firms have access to resources necessary to compete).
- Section 3.7 concludes the discussion of regulatory issues by focusing on ***consumer protection***, including ensuring services provided to people who tend to have low financial literacy are provided with a reasonable level of transparency to enable them to make informed decisions. Questions of privacy and data protection and data security are also addressed, as are the need for complaint and dispute resolution processes.

Having set out the above key areas, section 4 turns back to the roles of financial, telecommunications and competition authorities, and how these interrelate around some of the issues discussed in section 3. It explores the importance of collaboration among these authorities, yet also indicates where each can make progress where such collaboration is not possible.

The paper concludes in section 5 by affirming the importance of regulatory policy makers engaging with these issues in order to facilitate growth and competition.

These are matters that organisations such as the International Telecommunication Union (ITU), the World Bank's Consultative Group to Assist the Poor (CGAP), the Bill & Melinda Gates Foundation, and industry bodies such as the GSMA, have been examining from various different angles (many of their reports feature among the footnotes to this paper).

An important theme of this paper is the importance of collaboration among financial, telecommunications and competition authorities.[4] The ITU's Focus Group on Digital Financial Services[5], for example, brings together a wide array of stakeholders and is examining a number of matters discussed in this paper. It is to be hoped that even wider collaboration will bring together regulatory policy makers, private sector participants, civil society and other stakeholders to make their way across the regulatory minefield. The rewards of doing so successfully are a thriving mobile financial services sector that can play a valuable role in lifting populations out of poverty.

Box 1: International standardization activities in Digital and Mobile Financial Services in ITU-T

The ITU-T has a number of standardization activities relevant to digital and mobile financial services. Among its study groups (SGs) that develop standards, SG17 tackles security issues, SG12 quality of service and SG3 cost and competition issues.

In June 2014, ITU-T set up a Focus Group on Digital Financial Services (FG DFS) for financial inclusion to foster dialogue between telecommunications and financial services regulators, and the private and public sectors, in collaboration with the Bill and Melinda Gates Foundation. The work of the Focus Group on Digital Financial Services (FG-DFS) is looking at four main areas: DFS Ecosystem, Technology Innovation & Competition (TIC), Interoperability and Consumer Experience and Protection. The FG DFS, incorporating 60 organizations from some 30 countries provides a unique platform bringing together regulators and stakeholders from both telecommunications and financial services to share best practices and their experience in DFS. The deliverables of the Focus Group will address a range of issues in digital financial services such as interoperability, consumer protection, competition issues, security measures for DFS applications, quality of service, big data, merchant payments acceptance, digitization of payments, DFS platform features, data protection, regulatory framework for DFS, agent exclusivity and digital identity.

The FG DFS is expected to complete its work at the end of 2016 and transfer its key deliverables to the study groups for implementation as international standards.

ITU-T SG3 will fold the outputs of FG DFS into its ongoing work on developing international standards in the areas of competition policy, costing and charging, and digital identity. ITU-T SG17 will work on the recommendations of FG DFS to develop international standards in the fields of security and digital identity. The deliverables of FG DFS on quality of service issues will be transferred to ITU-T SG12 to develop key performance indicators (KPIs) for quality of service and experience for digital financial services.

[4] This paper builds on prior work of the ITU, including a chapter in Trends in Telecommunication Reform 2014 on digital transactions, as well as earlier work on the regulatory landscape for mobile banking in 2012 in the same publication.

[5] The Focus Group's webpage is available here.

Box 2. Terminology

'Mobile financial services' is a catch-all term used here to cover a wide range of potential financial services that can be provided over a mobile network, from mobile money services (including transfers and payments) to banking-type services (including deposits and borrowing), insurance and other services.

Mobile financial services depend on the basic notion of 'mobile money', a form of 'electronic money' issued on receipt of funds, redeemable for cash, that enables the user to carry out financial transactions over a mobile phone.[6] 'Electronic money' is part of any country's payment system[7], and may be stored on a range of other devices too, such as chips, prepay cards and computer systems.[8] Interoperability between these and mobile money will increasingly become an issue as digital financial services converge.[9]

Mobile money is usually denominated the given country's currency, and held on account in what is often referred to as a 'mobile wallet', or 'm-wallet', i.e., the record of the balance against which mobile money transactions are debited or credited. Mobile money is similar to 'airtime', except the latter only represents the prepaid amount held for the customer's use of services, e.g., voice calls, SMS and data usage. Mobile money actually had origins in the transfer of airtime from one customer to another.

A 'mobile money transfer' (MMT, also referred to here just as 'transfers') is simply the transfer of mobile money between two account holders over a mobile telecommunications service. This requires converting cash into mobile money (cash-in) through an agent and instructing the transfer on a mobile device. Once received, the transferee can convert the electronic money back into physical currency (cash-out) through an agent.

A 'mobile payment' (also referred to here just as 'payments') involves a mobile money transfer made in exchange for a good or service, for example, to an electricity or water company, school for payment of fees, or merchants. A mobile payment is often an alternative to using a debit or credit card or a cheque – or lining up in a long queue with cash – to make the payment. 'Mobile payments' also include 'bulk payments', which are made by a business or government to persons (G2P), for example in payment of salaries or social security.

As more and more people receive funds (e.g., salaries) into the mobile money system, and make and receive more transfers and payments using mobile money (e.g., for expenses), mobile money stays in its electronic form and there is less need to cash-in and cash-out.

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[6] Aron, Janine (June 2015). ''Leapfrogging': a Survey of the Nature and Economic Implications of Mobile Money,' at 6.

[7] The 'payments system' is the combination of mechanisms that governments, business and individuals pay each other for goods, services, taxes and other purposes, and typically includes an electronic payment and settlement system and real time gross settlement system (RTGS), an automated clearing house to process cheques and electronic funds transfers (EFTs), payment cards, payment cards, automated teller machines (ATMs) and point of sale (POS) devices, as well as mobile payments. See for example the Central Bank of Kenya's description of the national payments system, available here.

[8] Alliance for Financial Inclusion. (2012). Guideline Note - Mobile Financial Services: Basic Terminology. Available here.

[9] Aylward, C. et al. (September 2015), 'Review of Interoperability and Regulations of Mobile Money, EPAR Request No. 313,' Evans School Policy Analysis and Research (EPAR), Evans School of public Policy and Governance, University of Washington at 4.

'Mobile banking' is usually used to refer to more traditional banking services provided over mobile devices. Such services may include deposits, withdrawals, loans, account transfers, bill payments and balance inquiries. Mobile wallets effectively provide deposit (cash-in), safekeeping and withdrawal (cash-out) services just as banks do. The most significant evolution mobile banking presents for the user beyond mobile money transfers and payments is in offering interest bearing deposits and loans. It is in this shift that mobile financial services take a quantum leap forward in financial inclusion.

2 Financial inclusion and mobile financial services

2.1 Mobile money as a driver of financial inclusion

Access to financial services is a crucial enabler of economic and social development.[10] Until recently, policy efforts to develop financial services focused on the formal banking sector and its intermediating function in converting savings into investment. This meant that the wealthy, urban population enjoyed access to financial services while financial institutions neglected low income population segments (who generated low or negative returns) and rural areas (which required costly bricks and mortar branches).

Barriers to financial inclusion on the demand side include: [11]

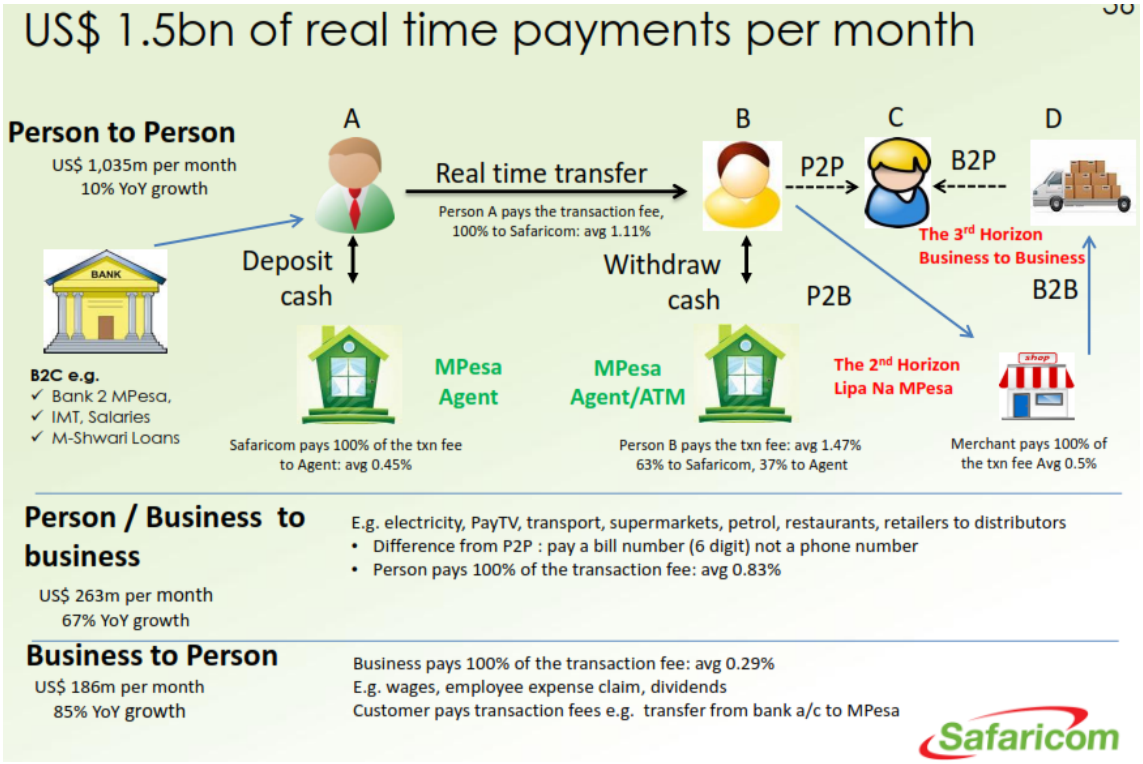
- ***affordability***, such as high interest rates on loans, high premiums on insurance products, and minimum balances on accounts;
- ***awareness and understanding***, both as to availability of products and how they are structured, priced and used;
- ***accessibility***, with financial products typically offered in urban centres and near high income users, and subject to heavy bureaucratic processes; and
- ***desirability***, with many products not designed for the needs of low income users.

Many would save through hiding cash, and borrow from friends and family or unlicensed money lenders – with all of their implications of limited capacity, security risks and high costs. A minority of the population in developing countries have held bank accounts. Banks have traditionally not pursued low income and rural populations, as returns would not justify the capital and operating costs of a brick and mortar branch and ATM networks. Traditional lending involves substantial costs including due diligence and credit risk assessment, as well as arranging collateral, which also faces delays and legal uncertainties in many countries.

[10] World Bank, 1989, *World Development Report: Financial systems and development*.

[11] CGAP, December 2014, Projecting Impact of Non-Traditional Data and Advanced Analytics on Delivery Costs, available here.

Figure 3. Mobile cash-in, cash-out, transfers and payments over M-Pesa



Source: Safaricom 2014-5 results presentation.

The rapid growth of mobile networks led to half of the world's population having at least one mobile subscription by 2014[12] and total mobile subscriptions reaching more than 7 billion by end of 2015.[13] The availability of mobile devices offered a distribution technology for mobile financial services for the unbanked. The initial impetus for mobile money services was for unbanked persons to transfer funds 'person-to-person' (P2P) that they had been transferring physically using mini-bus taxi services and travelling relatives or friends. The service brought people from the cash-based, 'unbanked' economy into modern systems of 'book-entry money.' It was the beginning of 'banking the unbanked.'[14]

Mobile money was first introduced in the Philippines in 2001, but the sector did not develop significantly for another five years, and services only became widespread in 2011.[15] At that time, mobile money grew quickly in many countries. For instance, in Cameroon, Orange launched in 2011 and MTN in 2012 and within 18 months, the market leader had over

[12] GSMA Intelligence (2015), 'The Mobile Economy 2015,' GSMA at 2, available here.

[13] ITU ICT facts and figures 2015, available here.

[14] Klein, M. & Mayer, C. *Mobile banking and financial inclusion: the regulatory lessons.* World Bank Policy Research Working Paper No. 5664 (May 2011).

[15] Aylward, C. et al. (September 2015), 'Review of Interoperability and Regulations of Mobile Money, EPAR Request No. 313,' Evans School Policy Analysis and Research (EPAR), Evans School of public Policy and Governance, University of Washington at 4.

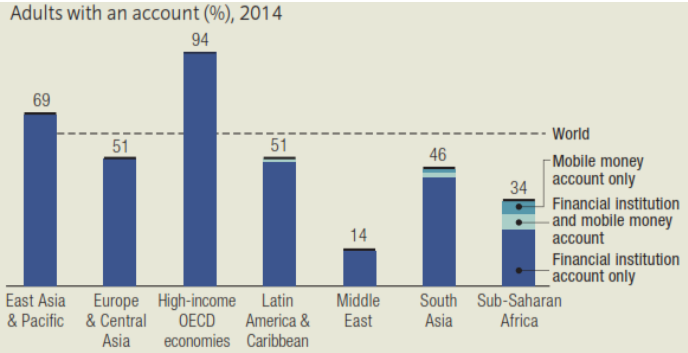
700,000 mobile money subscribers, growing to 3 million by 2016 (about 30% of the population).[16]

However, success with micro-credit since the 1970s and the uptake of mobile telecommunications in the 1990s and 2000s opened the opportunity for providing mobile financial services over mobile networks to the financially excluded.

The Global Findex database revealed that in 2014, 62% of adults had an account with a formal financial institution, i.e., bank, microcredit institution or mobile money provider. Many developing countries have very limited penetration of traditional financial services, particularly bank accounts and the range of services to which they provide access, such as transfers, payments, savings and loans (**Figure 1** and **Figure 4**).

Between 2011 and 2014, 700 million adults worldwide became account holders and the number of adults with no account dropped by 20% to 2 billion. The establishment of mobile money accounts has been a major driver of the increase in account penetration. The number of mobile money accounts reached 411 million globally in 2015, having increased by about a third from 2014. Mobile money is today available in 93 countries.[17]

Figure 4. Account penetration by type of account



Source: Global Findex database 2014

Mobile financial services more broadly are driving financial inclusion in countries where access to traditional financial services is very limited. In Sub-Saharan Africa, mobile money accounts drove the growth in penetration of general accounts (banks, micro-credit, savings and loans cooperatives, as well as mobile wallets) up by 10 percentage points from 24% in 2011 to 34% by 2014.[18] The increases are not merely the introduction of mobile money accounts: increasingly, banks are able to make their services available over mobile networks, and as a result bank accounts themselves are being opened at a faster rate.

Mobile money accounts are making financial services available to people who previously had no access to formal financial institutions. Six out of seven countries where less than 20% of the population has access to formal financial institutions (such as banks) have mobile money services. More than a third of countries with mobile money services had ten times more registered mobile money agents than bank branches. This physical presence is remarkable in bringing financial services into proximity to people in their daily lives – the agent on the

[16] *Development of the e-wallet in Cameroon*, Cameroon submission of 19 February 2016 to ITU Study Group 1 Rapporteur meetings.

[17] GSMA, 2015 *State of the Industry Report: Mobile Money*.

[18] World Bank, 2014 Global Financial Inclusion Report.

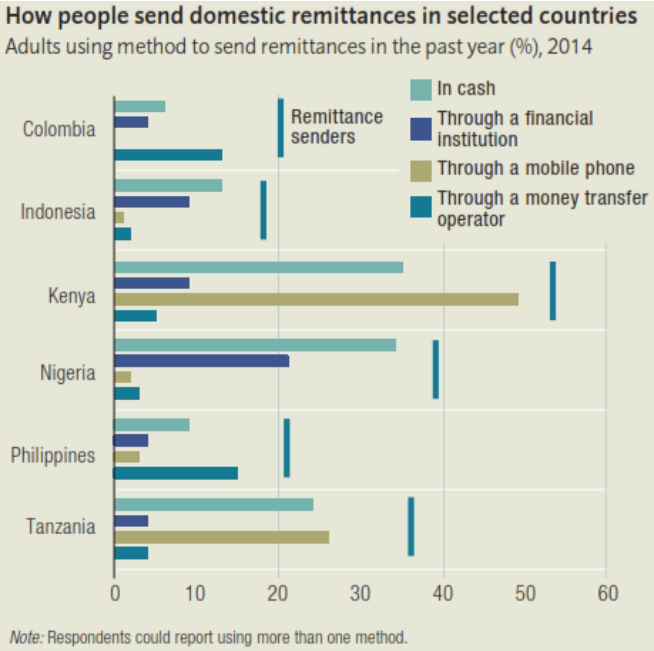
street corner and the connected device in the pocket. With the introduction of branchless banking through agents, it may also serve as a foundation for a wider surge in penetration by traditional financial institutions using some of these agent networks.

Switching from cash to mobile money transfers and payments improves efficiency by increasing the speed of payments and lowering the cost of sending and receiving them. Security is a significant benefit for remittances, which were previously vulnerable to theft and hold-ups on roads to rural areas for example. Transparency is also enhanced as the sender and recipient have a digital record, reducing the risk of leakage.

The largest number of mobile money transactions are person-to-person (P2P) transfers (71.5% of total volume of transactions) and airtime top-ups (66%).[19] However, only 3.6% of the value of all transactions was airtime top-ups.[20] The use of mobile money to make airtime top-ups reduces agent commission costs for top-ups.

Mobile money has been most successful in replacing cash transactions for domestic remittances, such as urban workers sending money to rural families. The fastest growing mobile money service is cross-border, led by remittances but with potential to support trade and regional integration.[21] In Central America, Colombia, Kenya, Mexico, Philippines and Tanzania, more remittances are sent by mobile phone than in cash. The World Bank found that 90% of Kenyans sending remittances in 2014 did so over a mobile phone.[22]

Figure 5. Methods of sending domestic remittances



[19] The majority of electronic transactions in Kenya, measured by volume, are airtime purchases. Zollman, J. & Cojocaru (2015), cited above.

[20] GSMA, 2015.

[21] The GSMA recorded 29 cross-border mobile money initiatives connecting 19 countries in 2015 alone. Cross-border transfers grew by 52% in volume (rather than value) compared with 2014 (GSMA, 2015 *State of the Industry Report: Mobile Money*).

[22] World Bank 2014, *Global Financial Inclusion Report*, available here.

Source: Global Findex database.

Importantly, using mobile money transfers and payments is a first step for many into the formal financial system. Data records of a customer's transfers and payments activity can become the basis of credit scoring that can facilitate mobile digital borrowing. The switch from informal borrowing and saving to the formal system (banks, micro-credit and -savings institutions, cooperatives and mobile financial services) can facilitate access to finance that was not otherwise available.

The financial inclusion impact of mobile money accounts is thus not merely a general increase in penetration of accounts: it has a particularly positive impact on access to financial services for disadvantaged income, rural and gender groups, bringing people into the financial services market who otherwise would have been excluded.[23]

Geographically, Sub-Saharan Africa has been a leader in growth in mobile digital financial inclusion, driven by mobile money services (**Figure 2**). South Africa launched mobile money services in 2004, Kenya followed in 2007 and Uganda in 2009. In many countries, most of the rise in general accounts was driven by growth in mobile money accounts. A third of mobile subscriptions had an associated mobile money account in Sub-Saharan Africa at the end of 2015 (this was 55% in East Africa). Tanzania doubled general account penetration to 40% in 2014 entirely by adding new mobile money accounts. In some countries, such as Zimbabwe, people have reduced accounts with financial institutions, switching to mobile money accounts.[24]

Today, all of the countries where over 10% of adults have a mobile money account are in Africa. In five of these thirteen countries (Côte d'Ivoire, Somalia, Tanzania, Uganda, and Zimbabwe) more adults reported having a mobile money account than an account at a financial institution.[25] In 19 Sub-Saharan African countries, there were more mobile money accounts than bank accounts.[26]

New services are also fast growing in Latin America and the Caribbean. Europe and Asia are also showing signs of accelerating growth. The latest countries to introduce mobile money in 2015 were Albania, Myanmar, Peru and Seychelles.

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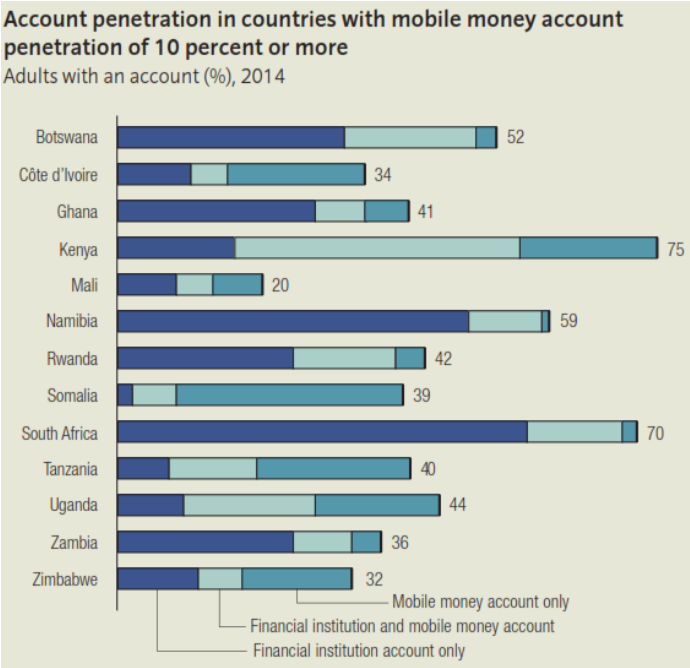
[23] See Claudia McKay and Michelle Kaffenberger in "Rural vs Urban Mobile Money Use: Insights from Demand-Side Data," Consultative Group to Assist the Poor (CGAP) blog, January 23, 2013, available here.

[24] World Bank, 2014, Global Financial Inclusion Report.

[25] World Bank 2014, *Global Financial Inclusion Report*, available here.

[26] GSMA, 2015 *State of the Industry Report: Mobile Money*.

Figure 6 Account penetration in leading African countries



Source: Global Findex database 2014

2.2 A growing financial business

Mobile financial services are becoming a significant revenue earner for some mobile operators. For instance, M-Pesa generated USD 320 million for Safaricom in 2015, more than a fifth of its revenues. Its USD 60 million growth in revenues from M-Pesa in 2015 (a 22.6% increase) was similar to the growth in revenues from broadband services, the service reporting the largest revenue increase.[27] Millicom, which holds the Tigo brand active in Africa and Latin America, generated USD 115 million in revenues from mobile financial services in 2015.[28] These companies, along with Econet in Zimbabwe, have strong expectations for ongoing high growth.

The revenue opportunity is only just beginning. Fees from transfers and payments necessarily remain limited in order to attract funds into the mobile money system, but the ability to generate high rates of interest on mobile money loans will leverage the system further.

Access to saving and borrowing facilities promise to be important financial inclusion drivers for social and economic development. People save for old age, education expenses, to start a business. People borrow to buy land or a home, for health and medical reasons, for education and school fees, or to start, operate or expand a business.[29]

[27] Safaricom, 2015 Annual Report.

[28] Millicom 2015 Annual Report, available here.

[29] World Bank, 2014 Global Financial Inclusion Report.

The business opportunity of providing banking services over mobile platforms is emerging, and mobile deposits and loans are on the increase. Safaricom's M-Shwari[30], the mobile lending platform, for example increased active customers to 5.8 million in 2015. It held Kshs 5.5 billion (about USD 54 million) on deposit and Kshs 2.1 billion (about USD 20 million) on loan at the end of its 2015 financial year. Most impressively, the non-performing loan rate for its loans was a mere 2.0%.[31] Safaricom's KCB M-Pesa banking product had registered 1.4 million users after launch in 2015, and was showing a rapid take-up in loans, reaching Kshs 950 million (about USD 9 million) in loans.[32]

The amounts on loan at any one time are only one indicator. Many loans are made for short duration, and quickly repaid. For instance, many are used for working capital, e.g., to buy livestock in the morning which are sold and the loan repaid in the afternoon. This makes the loans extremely profitable because the charge remains the same whether repaid quickly or at the end of the loan term.

It is not only in developing countries that mobile financial services present a commercial opportunity. For example, in Russia, telecom operators are partnering with banks to set up payment systems to pay for utility bills, public transport and other services.[33]

Box 3. Growth of financial inclusion in Kenya

In 2006, only 15% of adults in Kenya had an account with a formal financial institution, such as a bank.[34] Over 30% of adults used informal financial services, including through informal groups, employers and unregistered moneylenders. More than 40% of adults were entirely excluded from financial services in 2006. With the development of mobile money, by 2015, 71% of adults used mobile money. This also accelerated the opening of bank accounts: by 2015, the penetration of bank accounts had grown to 38% of adults. Indeed, mobile financial services appear to complement rather than replace traditional banking services. About half of those that use mobile money also have a bank account, and most bank account users also use a mobile money service.[35]

2.3 From mobile money to digital financial services

2.3.1 MNOs, aggregators and other mobile money providers

For a MNO, mobile money services began as value added services, additional to the core mobile voice and data business and partly a customer retention strategy. MNOs leveraged their existing physical telecommunications networks, agent networks, existing contractual relationships with customers, and distribution interface with the customer through the mobile phone, and deliver the service. Thus, where the regulatory regime so allows, MNOs have led

[30] M-Shwari, the most successful savings and loan product in terms of number of customers, was started in 2012 through a partnership between Safaricom and Commercial Bank of Africa (CBA).

[31] Business Daily, 11 July 2014, *CBA Aims for 10 million M-Shwari Accounts by Christmas*, available here.

[32] Safaricom, 2015 Annual Report.

[33] See Mastercard's Mobile Readiness Index, available here.

[34] Source: FinAccess. (2016). 'FinAccess Household Survey'. Available here.

[35] Financial Inclusion Insights (2014) reports that 49% of people that use a mobile money service also have a bank account. Source: Intermedia. (2015). 'Kenya. Digital Pathways to Financial Inclusion 2014 Survey Report'. *Financial Inclusion Insights*: *Applied research for digital financial inclusion.* Available here.

the growth of mobile money transfer and payment services. Over half of all MNOs in Sub-Saharan Africa had launched a mobile money service by the end of 2014.[36]

MNOs are not the only providers of mobile financial services. Banks and other providers also offer services. Numerous providers that are neither MNOs nor banks can offer account, transfer and payment services over the mobile network as well. Examples include BIM in Peru, EzeeMoney and PayWay in Uganda, and Tangaza and MobiKash in Kenya. Some provide wallets, transfer and payment services to retail customers. They can also in some cases aggregate the ability to pay funds into and receive funds from MNOs' mobile money services and bank accounts.

The MNOs control the mobile telecommunications networks. Until feature phones are replaced by smartphones and customers can access the mobile money provider directly via the Internet, the provider must negotiate access to the network and customer with the MNO. The network services required are usually unstructured supplementary service data (USSD), as discussed in section 3.4.1. A variety of models are used to negotiate access to these channels, and it is a key area where competition problems arise, as discussed in section 3.4.2.

In addition to providing aggregation services at the mobile wallet end, providers are also aggregating services at the payment 'biller' end. Such innovation is often led by smaller companies that chase niche markets, or add particular functionalities. For instance, aggregators such as Kopo Kopo in Kenya, Selcom in Tanzania and Pegasus and Yo! Uganda in Uganda provide the technical interface to integrate multiple merchants, schools and utilities into the mobile payment system. Their services enable the billers to track customer receivables and payments, and to better manage overdue payments, bad debts and cash flow. Such companies typically need access to the MNO's application programme interfaces (APIs) for this purpose. The MNO's control over who it grants such access to affects the development of competition in this market.[37]

Other mobile money providers rely on the mobile telecommunications network even if the customer's device is not the primary means of interface and mobility is not the central feature. For instance, Uganda's Payway introduced kiosks where customers could purchase airtime, and expanded its offer to the ability to pay TV providers, electricity purchases, purchase data, and payments for electronic ticketing. Also in Uganda, EzeeMoney provides various payment services over mobile networks using point of sale (POS) devices connected to SIM cards.

Box 4. Innovations in payment aggregation

A wide variety of institutions are partnering with mobile money providers to facilitate transfer and payment services, which reduce security risks for both sender and receiver.

For example, Nestlé recently entered into a partnership with Telenor's Easypaisa service in Pakistan to establish mobile money accounts and regular payments to up to 15,000 farmers who sell milk to the food company.[38] Efficiency, transparency and security gains for buyer

[36] GSMA (2014) at 18.

[37] For example, in Uganda, MTN has restricted the number of such aggregator/integrators to five entities that it trusts with its APIs.

[38] Easypaisa and Nestlé Launch Payments Mechanism for Dairy Farmers, *Pro Pakistan*, 12 April 2016, available here.

and seller are matched by the commercial opportunity presented to the mobile money provider in attracting users and integrating itself into regular economic activity.

The National Payment Corporation of India is launching a unified payments system with 29 banks over a smartphone app.[39] This will enable payment recipients, such as merchants, to initiate requests for payments. The payer need only accept the request and the transfer is executed, simplifying the payment process.

2.3.2 Convergence of mobile and banking services

For a MNO, entering into mobile banking would be a big step, requiring a banking license and becoming subject to banking regulation, including reserve requirements and other regulatory supervision.[40]

A MNO may choose to set up its own operation and apply for a banking licence. For instance, after Bharti Airtel, Vodafone M-Pesa and others in India were issued in-principle 'payment bank' licences (authorising deposit taking and transfer services), Bharti Airtel was recently upgraded to a full banking licence authorising lending as well.[41]

Some MNOs have chosen instead simply to buy an existing bank. For instance, Econet in Zimbabwe acquired Steward Bank.[42]

More commonly, the MNO may partner with an existing bank and deliver savings and loans through its existing mobile money service interface, as Vodacom did in Tanzania with Commercial Bank of Africa (CBA) in launching M-Pawa.[43] Safaricom did so earlier with CBA (M-Shwari) in 2012, and with Kenya Commercial Bank (KCB M-Pesa) in 2015, each of which are accessible through the M-Pesa menu. In Uganda, MTN is at time of writing preparing to launch mobile lending with Stanbic Bank. Because most developing countries have more mobile subscriptions than bank accounts, the introduction of mobile banking has driven up the number of bank accounts substantially.[44] MNOs such as Tigo in Ghana have also successfully partnered with insurance companies to offer insurance products.[45]

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[39] Anand, N. 2016, E-commerce, merchants to drive Unified Payments Interface growth: NPCI, *Business Standard*, 7 April 2016, available here.

[40] Often, unlike mobile wallets, deposits from each mobile bank user must be held in discrete accounts, and may not be pooled with other deposits in a trust account.

[41] R. Hanford, Bharti Airtel subsidiary receives Indian banking licence, 12 April 2016, *Mobile World Live*, available here.

[42] Tausha, I., G. Robb, T. Vilakazi (2015) 'Competition and regulatory issues in emerging mobile payments markets: a case study of Zimbabwe', paper presented at ***1st Annual Competition and Economic Regulation (ACER) Conference,*** Victoria Falls, Zimbabwe.

[43] CGAP blog, 27 November 2015, *M-Pawa 1 Year on: Mobile Banking Perceptions, Use in Tanzania*, available here.

[44] In Kenya, for instance, Safaricom has effectively been responsible for a massive increase in the number of bank accounts with introduction of its M-Shwari banking partnership with Commercial Bank of Africa, and in 2015 its KCB M-Pesa banking partnership with Kenya Commercial Bank. Cook, T. and C. McKay. (2015). 'How M-Shwari Works: The Story So Far'. *Access to finance forum*. No. 10. '' CGAP and FSD Kenya. Available here.

[45] CGAP blog, 15 February 2013, *Can Phones Drive Insurance Markets? Initial Results From Ghana*, available here.

In contrast, for a traditional bank, entering into the mobile banking business is essentially adding a delivery channel, whether as a value added service for existing bank customers to conduct their transactions or as a means of acquiring new customers. In wealthier economies, it typically involves providing a web interface for transfer, payment and investment transactions – an additional feature layered onto traditional banking.

Some banks have even chosen to enter the mobile services market by establishing a mobile virtual network operator (MVNO) in order to distribute their banking services, as Equity Bank has done in launching Equitel My Money in Kenya.

Where banking is largely unavailable, mobile banking opens up an entirely new market. It offers the chance to reach consumers that would not otherwise be served, providing banking services over their phones without entering a bank branch or dealing with a bank agent.

In terms of core competencies, mobile money providers move value through space, while banks' move value through time, and the trend is for these functionalities to converge. Firstly, the combinations of usage of mobile money and bank accounts, with their transfer, cash-in/deposit and cash-out/withdrawal functions, are increasing in variety. Customers with bank accounts increasingly transfer funds[46]:

- to unbanked persons by making transfers to their mobile wallets (more money flows from bank accounts to mobile wallets than the other direction); and
- to their mobile wallets to pay businesses or cash-out through mobile money agents instead of withdrawing at ATMs or bank branches, presenting significant opportunities for MNOs.[47]

Secondly, MNOs are evolving from providing mobile money services to jointly providing services through partnerships with banks, to providing bundled services of telecommunications and banking through a single entity with multiple licences. In turn, banks are becoming more convenient and less costly, as they are increasingly permitted to provide 'branchless banking', i.e., transacting certain banking services with the customer through an agent, which might also be an agent for a mobile money service.

Banks and MNOs are thus at times directly competing, with MNOs entering into mobile financial services, including mobile banking through partnerships with banks, and banks offering mobile wallets. This has implications for the regulation of market entry as in a number of countries, market entry has been permitted only under a bank-led model.

The potential rivalry between banks and MNOs also has important implications for competition in the market for these services. Most countries' banking sectors have several, if not dozens, of competing banks. In contrast, the mobile telecommunications business is a highly concentrated market due to scarcity of spectrum available for standard technologies and high sunk costs. Yet the banks rely on the MNOs to reach the customers, which exposes them to risk of exclusion by the MNOs from the market. Mobile money should not be restricted to banks and other financial institutions, but they should not be excluded from the market either.

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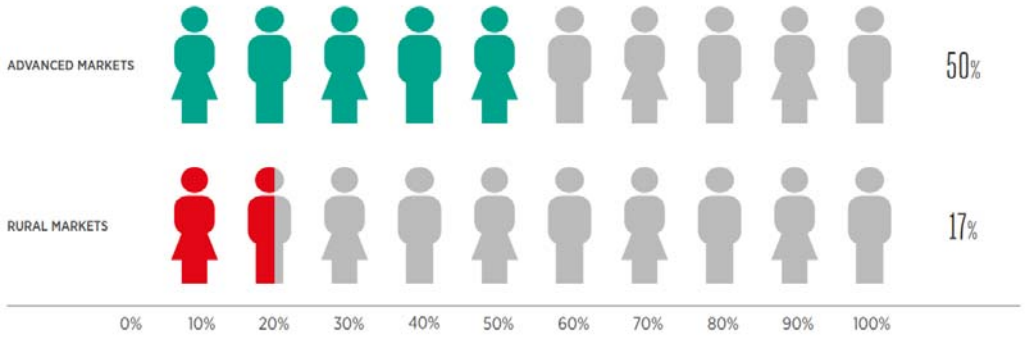
[46] Pasti, F. (November 2015), 'A2A interoperability: What is happening between banks and mobile money providers?,' GSMA – Mobile for Development – Mobile Money blog post, available here.

[47] Hernandez, Bernstein and Zirkle, 2011. *The Regulatory Landscape for Mobile Banking*. GSR11 Working Paper. Available here.

2.4 The need to develop mobile money further

While all this growth is very encouraging, there remain many countries that have not adopted mobile money, and even among those that have, growth has faltered and sputtered in many. The number of substantial revenue generating mobile money operators is actually quite limited, even if it is growing. Only fifteen mobile money providers had monthly revenues greater than USD 1 million during the middle of 2015, and only three of these were not MNOs. Only twelve had over one million 'active accounts.'[48]

Figure 7. Captured addressable mobile money market (active 90-day customers per GSM connections)



Source: GSMA, October 2014, Spotlight on Rural Supply: Critical factors to create successful mobile money agents

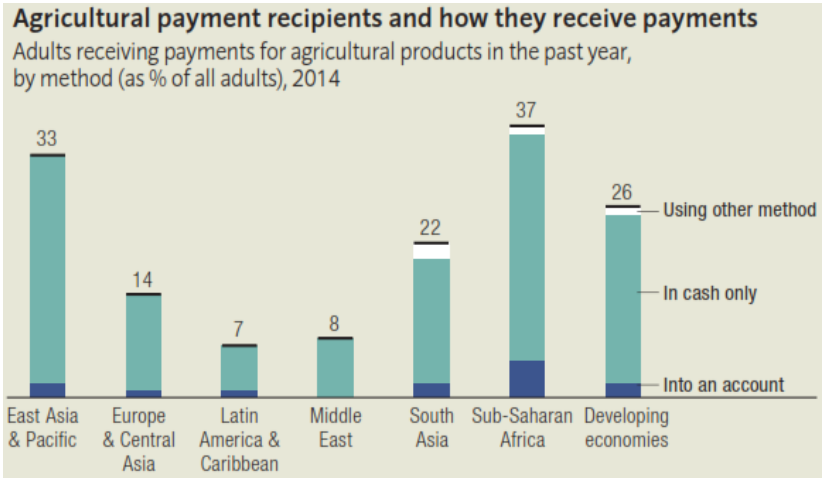
There remains a major disparity between urban and rural reach of mobile money. The latter, of course, are where most of the financially excluded reside, making extension of mobile financial services into rural areas a priority for financial inclusion. In countries that are predominantly rural, only 17% of mobile phone subscribers use mobile money actively, compared with 50% in countries that have more advanced economies (**Figure 7**).[49]

Furthermore, although mobile money presents extensive opportunities, cash remains the predominant means of making payments even in countries with the highest mobile money penetration. Cash is still 'king', as illustrated in **Figure 8**.

[48] GSMA, 2015. Active accounts are measured for these purposes on a 90-day basis.

[49] GSMA, October 2014, Spotlight on Rural Supply: Critical factors to create successful mobile money agents, available here. The GSMA defined 'rural' as being economies where 30% or more of the GDP was from agriculture.

Figure 8. How agricultural payments are received



Source: Global Findex database.

For all the waiting time saved paying utilities by mobile money instead of cash, even these are still largely paid in cash, as shown in figure 9.

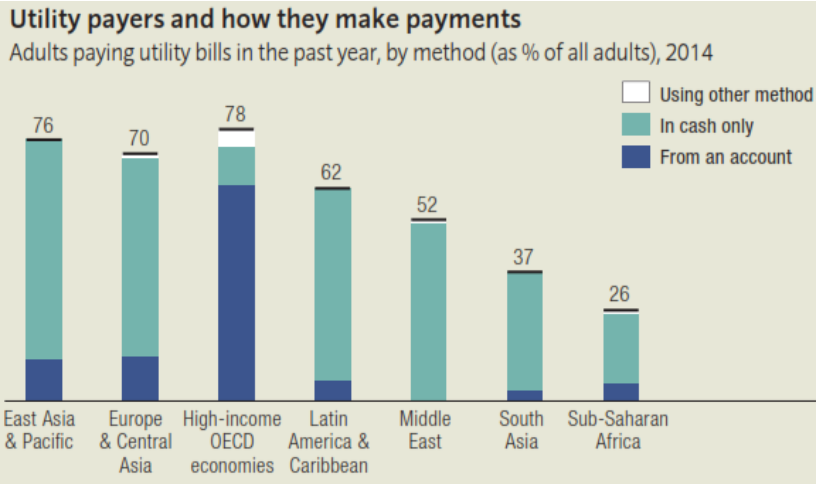
Cash remains predominant even in Kenya, where M-Pesa has been deeply integrated into daily economic life (though where payment is made electronically, the main means is mobile money).

Despite the large variety of services that are being developed, the vast bulk of mobile money use is still for basic transfer and payment services: i.e., cash-in, transfer and cash-out. Of mobile money in circulation, 94% is P2P and only 6% is merchant payments, with 76.8% of money leaving the mobile money system as cash-out rather than bill payments, bank deposits and other uses.

Even where mobile money is used for remittances, the money transferred is typically cashed-out and used to pay for family expenses.[50] Thus the use of services remains primarily a substitute for cash transactions rather than to start a business, buy equipment or build up savings.

[50] Source: Zollman, J. & Cojocaru (2015), cited above.

Figure 9. How utilities are paid



Source: World Findex database

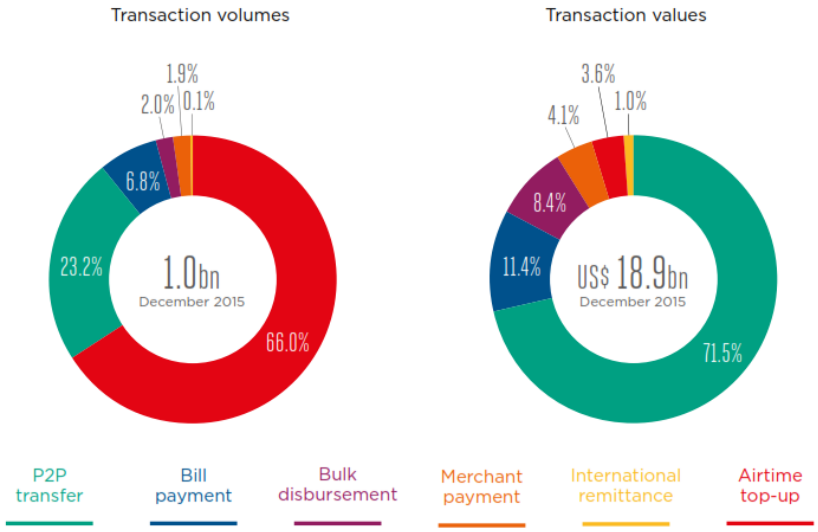
Even in the transfer and payments market, innovation also remains quite concentrated. For instance, the development of merchant payments is accelerating, yet four mobile money providers are responsible for about 80% of the worldwide volume of merchant payments, a crucial market for the development of ecommerce and cashless purchases in stores.[51] Competition in mobile money services is increasing, but remains limited. About a third of countries with mobile money services have only one provider, a further third have only two, and a third have three or more (with a median of five providers).[52]

Only in a few countries have services developed a thriving market in savings, loans and insurance. Thus while mobile money increases 'financial inclusion', the actual use of financial services remains in very early stages of development.

[51] GSMA, 2015 State of the Industry Report: Mobile Money.

[52] GSMA, 2015 State of the Industry Report: Mobile Money.

Figure 10. Global product mix by volume and value (December 2015)



Source: GSMA, 2015 State of the Industry Report: Mobile Money.

Successful take-up of mobile money will not itself solve all financial inclusion problems. For instance, even with availability of mobile credit, borrowing remains extremely expensive. Where substantial amounts require to be secured by collateral, whether by pledging movable assets or mortgaging property, many countries have severe problems with their laws and administration of collateral. This increases costs, including legal fees, and imposes extensive delays. Mobile money is thus not a complete solution for financial inclusion.

However, mobile financial services do play a hugely important role in opening access to financial services for vast numbers of people, increase economic efficiency and transparency, and spur on a race to provide financial services to population groups that were previously ignored. And ensuring that the regulatory regime will enable growth and competition in such services is surely a high priority for any country seeking to help its people climb out of poverty.

In short, the opportunity for financial inclusion is huge, and only just beginning.

3 Regulating for financial inclusion

3.1 The importance of good regulation

The successful development of mobile financial services in the future will have a major impact on financial inclusion. For those countries still to launch services or in the early stages of doing so, a number of factors explain whether such services will take-off rapidly or flounder. One of these is regulation.

Mobile financial services, like telecommunications, face 'network effect' dynamics common to 'platform' services. Network effects exist where the utility derived from consuming a service increases as the number of users increases.[53] This applies both in telecommunications

[53] Rohlfs, J, 1974 *Bell Journal of Economics and Management Science*, A Theory of Interdependent Demand for a Telecommunications Service.

and payments markets. Positive feedback loops often apply so that as the number of users increases, even more are attracted to the platform.

Furthermore, mobile money services are what economists call a 'two-sided platform.' A two-sided platform brings together two groups who need each other to generate mutual value from the collaboration. The utility of a mobile money system depends not only on the number of people to transfer and receive funds, but also on access points to the system itself for putting the cash in and taking it out (in addition to a safe and reliable transfer system). For traditional banks, these are branches and ATMs, and in mobile money they are agents.

However, the very thing that makes a two-sided platform successful is also what makes it hard to get going. The ability to attract users depends on having attracted enough users and agents in the first place. As a result, possibly after a period of slow growth, they will either ignite and take off or wither.[54] Mobile money appears to have followed this model, beginning in 2004, but only really launching widely in 2009-10, and then igniting in several countries.

Figure 11. Mobile Money Scheme Successes and Failures

Ignition with Explosive Growth	Ignition with Weak Growth	Failed to Ignite	Too Soon to Assess Ignition	No Basis
Bangladesh	Ghana	Burkina Faso	Democratic Republic of the Congo	Paraguay
Cote D'Ivoire	Philippines	Haiti	Sri Lanka	
Kenya	Pakistan	India		
Rwanda		Indonesia		
Somaliland		Madagascar		
Tanzania		Mexico		
Uganda		Nigeria		
Zimbabwe		South Africa		

Source: Evans & Pirchio, 2015 (although based on earlier data).

The regulatory framework is a key success factor. A 2015 empirical study of 22 countries[55] found that regulation plays a key role in the success of mobile money:

- By far the most countries where the sector ignited and grew explosively did not require a bank to be involved for anything other than to hold funds. They had minimal limitations on who could operate a mobile money scheme, relatively light 'know your customer' (KYC) requirements, and minimal restrictions on who could serve as an agent.
- In contrast, by far the most countries where the sector failed to ignite had relatively heavy regulation requiring banks to take the lead role – to the exclusion of MNOs. They then typically imposed other heavy burdens including stringent KYC requirements and restrictions on who could operate as an agent.

[54] David S. Evans, *How Catalyst Ignite: The Economics of Platform-Based Start-Ups*, in PLATFORM, MARKETS AND INNOVATION, (Annabelle Gawer, ed. 2009). Available here. David S. Evans and Richard Schmalensee, *Failure to Launch: Critical Mass in Platform Businesses*. 9(4) REVIEW OF NETWORK ECONOMICS (2010). Available here.

[55] Evans & Pirchio, 2015 (see footnote 1).

For those countries that have already achieved widespread penetration and use of mobile money services, the challenge will be to ensure that competitive market dynamics put appropriate discipline on providers in terms of the prices they charge, their incentive to innovate, and the quality they provide.

The same network effects that make it hard to get a platform industry going and yet generate successful models can create competition problems. These include exclusive arrangements with agents, pricing and conditions of access to the necessary underlying telecommunications network services, interoperability between the services of different providers, and market power from control over customer data.[56] These issues are taken up in this section 0.

Resolving such issues typically requires regulatory intervention. Yet a large number of countries still do not have an enabling regulatory framework for mobile money. Even out of those where mobile money services exist, nearly half do not have an enabling regulatory framework. Even countries that have established a regulatory framework are struggling to get it right. There remain very significant challenges in getting the right financial regulatory model for licensing market entry, prudential regulation of deposit taking and consumer protection in lending. There are significant challenges also in the interplay between telecommunications and financial services, with the latter being provided to the customers and running over the networks of the former.

Some regulatory issues fall squarely within the remit of the financial services regulator, typically the Central Bank (e.g., authorising market entry, prudential regulation and account-to-account interoperability), some of them squarely within the remit of the telecommunications regulator (e.g., access to and pricing of telecommunications network services used for delivery of the services), and some of them crossing both regulators' areas of responsibility or even general competition authorities where these have been established (e.g., agent exclusivity). Coordination among these regulatory bodies is crucial to develop a regulatory landscape that will enable mobile financial services to thrive.

Enabling regulation will not alone guarantee success of mobile money in a country. Building a mobile money business involves numerous challenges. Mobile operators typically do not invest unlimited amounts of capital expenditure, and remain focused on their core telecommunications business and their networks and value added services. A business manager must justify the decision to invest in mobile money in competition with other demands for capital investment of the business. Mobile money neither yields short-term returns nor is it tied to long network investment cycles. Many MNOs thus underinvest in mobile money with the result that agent networks are inadequate, interfaces are not user friendly, and marketing is weak, resulting in slow take-up.[57] Thus an enabling regulatory environment is a necessary but not sufficient condition for the growth of mobile financial services.

[56] Bourreau and Valletti, 2015; Robb and Vilakazi, 2015; Maezer 2015; and Sitbon, 2015.

[57] GSMA

3.2 Prudential regulation and customer due diligence

3.2.1 Managing opportunity and risk

A fundamental question in designing any regulatory framework concerns market entry: who is to be allowed into the market and on what basis. The approach to financial regulation of mobile financial services is crucial to whether they will take-off and grow rapidly or not.

In most countries, often for good reasons, financial services face strong regulatory requirements. There are two broad themes in financial regulation:

- ***prudential regulation***, concerned with the integrity of financial institutions and the stability of the financial system as a whole; and
- ***market conduct regulation***, concerned with protecting the consumer from unfair contracting, fraud and excessive prices and interest rates (and possibly advocating competition).

Banks serve as intermediaries between those who have and those who need money, taking deposits from the former and lending to the latter. They invest deposits in loans and instruments with different maturities, prospects of repayment and return, and ultimately ability to fund repayment to depositors. While generating higher returns, the banking business carries risks of 'bank runs' and financial instability.

Stringent prudential regulations on banks in particular are intended to ensure that the financial system is robust, resilient to shocks, and so less vulnerable to such financial instability and systemic risks.[58] Banks therefore are subject to prudential regulation (as well as deposit insurance) to address these risks.[59] They often face:

- ***capital requirements*** as to the amount of their equity in relation to the debt (amount, risk and maturity) they carry to avoid them funding themselves excessively through debt and becoming insolvent;
- ***reserve requirements*** regarding the proportion of their assets that must be held in cash and highly-liquid assets, enabling them to meet deposit withdrawals and other obligations;
- ***governance requirements*** aimed at managing the financial risks of managing the maturities of deposits and loans, currencies and other factors relating to the nature of investment; and
- ***reporting and disclosure requirements*** that have the purpose of enhancing internal governance and facilitating external supervision of the above requirements.

However, different financial services involve various levels of risk, and so merit different types of regulation. Where there is a diversity of services, and where providers offer only lower risk financial services, full banking regulation may be unnecessary, disproportionate and counterproductive to the development of such financial services.

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[58] For example, Basel Committee on Banking Supervision, 2010, Basel III: *A global regulatory framework for more resilient banks and banking systems* strengthened regulation in the wake of the 2007 financial crisis.

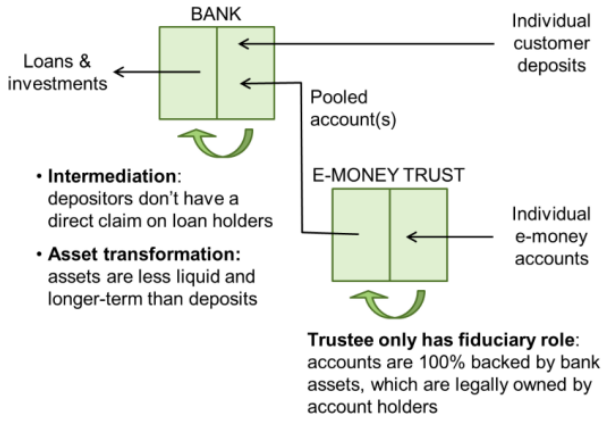
[59] Reinhart, C M and K S Rogoff (2009): "The Aftermath of Financial Crises," *American Economic Review*, vol. 99(2), pp 466–72.

For example, some basic financial services do not entail significant systemic risk, and only require certain key protections:

- ***Conversion of cash to electronic money*** (cash-in) depends on proper authentication of the cash, identification of the customer, and a reliable book keeping system.
- ***Storage of money*** for safe keeping (instead of keeping it 'under the mattress') depends primarily on the same things, as well as control over access to the funds, making governance, audits and KYC procedures key to ensure the integrity of the system.[60]
- ***Transfers and payment services*** require documentation of the delivery to and transfer by the network, authentication of the recipient, and so rely on internal messaging and control protocols to protect against fraud and system failure. Prevention of terrorism finance and money laundering may also justify limiting the amounts that may be transferred, requiring certain record keeping, and identification of the sender.

Such electronic money services may serve as a conduit for money into the banking system (see **Figure 12**), but in themselves they can be provided without the credit, market or liquidity risk associated with full 'banking' services. Because the risks of investing are not present in the mere provision of mobile money transfer and payment services, many of the prudential regulations applicable to banks are therefore not necessary or relevant to such services. Market conduct regulation may suffice to protect consumers and support trust in such services through transparency and disclosure requirements, standards for informing customers of the balances held and transactions carried out, and audit requirements. A lighter licensing regime, such as e.g., electronic money issuer (EMI) licences, may be appropriate.

Figure 12. Electronic money as a pass-through into the banking system



Source: Mas, I, 29 July 2014, Shifting branchless banking regulation from enabling to fostering competition, available here.

This point is particularly important for financial inclusion, as unnecessary regulation acts as a major barrier to entry and growth in mobile money. There are, then, strong financial inclusion policy reasons to calibrate the regulatory requirements to be well-suited and proportionate to the risks involved in the activities of the service provider. As stated in a Bank of International

[60] Makin, P, 2009, *Regulatory Issues Around Mobile Banking*, OECD.

Settlements paper, "regulation should be designed by type of service"[61] and not according to whether the core business of the provider is a bank, a MNO or something else.

While robust regulation is needed to protect against systemic risks in banking, "In the case of basic financial services for the poor, the danger seems not so much systemic repercussions that might impose large financial costs; the danger is more that such services do not emerge in the first place, and financial inclusion simply does not happen." [62] The still weak performance of a lot of countries' mobile money sectors (see section 2.4) suggests that these lessons are still highly pertinent.

Getting the level of financial regulation right allows new service providers to enter the mobile money market and innovate who otherwise would not. In the early phase of a mobile money market, MNOs are one potential such new entrant. They already have the networks over which the services are provided, have contractual relationships with the target customers, have a basis for rapid deployment of agent networks, as well as strong brands and marketing experience.[63]

Financial services regulators have taken a variety of approaches to regulating the provision of mobile money transfer and payment services. In some cases, these have been ad hoc in the absence of enabling legislation, using 'no objection letters' as pioneered by Kenya.

Some regulatory frameworks have been patched together in the absence of enabling legislation. In Uganda, the absence of such legislation the Bank of Uganda has had to control mobile money providers through its regulatory mandate over banks. A mobile money provider that is not a licensed financial institution can only enter the market under an arrangement with a licensed financial institution, and it is the latter that obtains the authorisation from and is supervised by the Bank of Uganda. Thus banks intermediate between mobile money providers and the regulator, acting as the conduit for authorisations, reporting and enforcement through their licences.

However, regulatory models that require a mobile money provider to have a banking licence or form a certain kind of partnership with a bank in order to provide transfer and payments services impose a significant barrier to entry into the market. Such approaches are increasingly viewed as disproportionate in addressing the actual risks presented by the activities.

3.2.2 Safeguarding user funds

3.2.2.1 *Insulating the float from risk*

In the mobile transfers and payments market, the mobile money provider naturally always has a positive balance of funds held for the users, known as the 'float.' A key question is what it should be permitted to do with such funds, and what should happen to any interest or other value they accrue.

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[61] Dittus, P. and Klein, M., 2011, *BIS Working Papers, No 347*, On harnessing the potential of financial inclusion.

[62] Dittus, P. and Klein, M., 2011, *BIS Working Papers, No 347*, On harnessing the potential of financial inclusion.

[63] For these reasons, MNOs still lead mobile money services today. According to the GSMA, 69% of services launched in 2015 are operationally run by MNOs, and 58% of all live services are MNO-led.

At one end of the spectrum, putting the funds in a safety deposit box or non-interest bearing account with a bank imposes an opportunity cost, as funds sit idle and lose value with inflation (a real issue in many countries). Thus inaction may avoid some market risks, but it encounters others.

At the other end of the spectrum, if the provider takes the funds and lends them like a commercial bank, or trades and invests like an investment bank, it needs to be regulated like a bank. Far more stringent regulation would be necessary to ensure that the provider – and its agents – always have liquidity to pay those who wish to cash-out, and to complete transfers and payments.

Regulatory approaches vary in the space between these extremes when it comes to what the mobile money provider can do with the float. The underlying objective is to ensure that the funds are available for payment to users when they seek to cash-out of the system. This requires them to be free of risk of loss through poor investment, or of claims by creditors of the mobile money provider. Typically, the funds are pooled together, and held separately ('ring-fenced') from other assets:

- ***Risk of loss*** is minimised through limitations on the kind of account that may be used for holding the funds. In some cases, it must be a prudentially regulated financial institution, often a licensed bank (Afghanistan, Uganda). In some countries, greater flexibility is allowed by permitting funds also to be kept in other liquid assets approved by the Central Bank (Kenya and Nambia), or in government securities (Philippines).[64]
- ***Protection from creditors*** is achieved through a common theme that the funds must be unencumbered, i.e., not subject to creditors' claims other than the mobile money users themselves whose cash it represents. The protection from creditors is in some cases achieved by requiring that the account be an 'escrow account' held for the benefit of users (Uganda[65]) or a mechanism such as a trust or fiduciary (Democratic Republic of the Congo[66]).

The more protective such safeguards are, the less need there is for prudential regulations that typically apply to banks, such as reserve requirements and capital requirements, as users are protected directly by the segregation of the funds. (Indeed, the requirement to pool the funds and keep them separate amounts to something like a 100% reserve requirement.)

3.2.2.2 *Interest earned on user funds*

When it comes to what may or may not be done with the interest or other value that accrues on the float, rules also vary, with it being used: only for charitable purposes (Kenya); for the direct benefit of mobile money customers subject to Central Bank approval (Liberia); for the indirect benefit of mobile money customers such as promotional campaigns (Lesotho); passed on to customers (Ghana); or left for the mobile money providers to use as they please (Afghanistan, India and Namibia).[67]

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[64] Dittus, P. and Klein, M., 2011, *BIS Working Papers, No 347*, On harnessing the potential of financial inclusion; GSMA, di Castri, S., 2013, *Mobile Money: enabling regulatory solutions*, available here.

[65] Bank of Uganda, *Mobile Money Guidelines* 2013.

[66] Banque Centrale du Congo, *Instruction* n.24/2011.

[67] Dittus, P. and Klein, M., 2011, *BIS Working Papers, No 347*, On harnessing the potential of financial inclusion; GSMA, di Castri, S., 2013, *Mobile Money: enabling regulatory solutions*, available here.

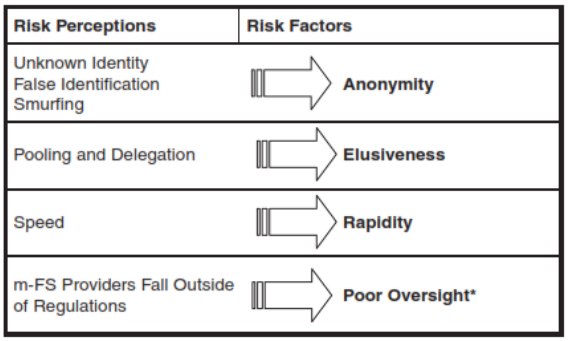
In Tanzania, Tigo Pesa began distributing interest that accrued on underlying trust accounts to its mobile money customers and agents in 2014, followed by M-Pesa and Airtel Money. Significantly, the annual interest rate has been high enough to be competitive with savings accounts.

Hesitation among regulators to allow mobile money providers to return interest earned on the float to users seems to arise from association with the traditional ensemble of banking activities. Regulators are concerned in particular about the risks arising from the intermediation function of taking deposits and putting them at risk by lending and investing them. However, the mobile money float is not put at risk in this manner but instead is protected from loss and creditor claims as described above. As such, there remains little rationale (perhaps other than to protect banking deposits from competition) to prevent mobile money operators returning interest to users on their mobile wallet balances. Indeed, allowing this where they can do so without excessive administrative cost may enhance competition and innovation in mobile money services.

3.2.3 Protecting against fraud, terrorism finance and money laundering

Banking and payment systems are exposed to 'integrity' risks that arise from the anonymity of payments, the difficulty of tracking them due to pooling of funds and delegation of functions, the speed with which transactions occur, and the difficulty of regulating the system (**Figure 13**).

Figure 13. Risk factors identified with mobile money



Source: Chatain, P., Hernández-Coss, R, Borowik, K, Zerzan A, 2008, Integrity in mobile phone financial services, World Bank Working Paper No. 146

Financial regulation requires licensed financial institutions to manage such weaknesses in order to control risks of use of banking and payment systems for fraudulent, terrorist and money laundering purposes. It does so through a combination of:

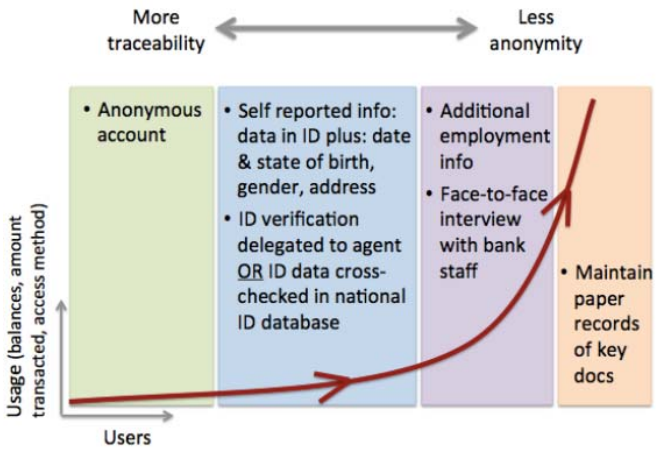
- ***know-your-customer*** (KYC) requirements to carry out initial due diligence on customers;
- ***authentication*** procedures to identify customers when transacting, and to verify their instructions; and
- ***amount limitations*** on deposits or amounts that may be transferred.

In countries where a national ID system or equivalent identification measures are not in place, stringent customer identification requirements may be disproportionate to the risk of the transactions. Tiered or progressive KYC rules vary with the following parameters:

- the amount of information the system needs from customers;

- the documentation customers must bring to verify that information, such as national IDs, birth certificates, evidence of residence; and
- how these documents are in turn verified, such as through face-to-face meetings and cross-referencing to other databases, and whether such verification can be delegated to agents.

Figure 14. Progressive KYC in Mexico



Source: Mas, I, 29 July 2014, Shifting branchless banking regulation from enabling to fostering competition, available here.

The risks presented by mobile money systems grow with their scale, but so also do the financial inclusion opportunities they present. The risks are increasingly mitigated by a mobile money system's ability to identify customers through SIM registration and PIN numbers and record transactions digitally. This makes them less anonymous than cash (reducing anonymity risk), track each transaction (reducing elusiveness risk), and monitor the number, frequency and scale of transactions (enabling oversight).[68]

Telecommunications regulation itself can support the objectives of financial regulation. For instance, a wave of regulation has swept the World in recent years, requiring MNOs to register subscribers. This has been so forceful that non-compliance has led to disconnecting large numbers of customers (e.g., Uganda's MTN disconnected 3.7 million customers in 2015[69]), and major fines (the Nigerian Communications Commission imposed the World's largest ever known fine on a telecommunications operator for failure to carry out registration[70]).

Telecommunications KYC requirements are thus increasingly becoming an input to compliance with KYC requirements for mobile financial services. In Uganda, for example, the Bank of Uganda is in the process of approving the introduction of lending products by MTN in collaboration with the bank CBA, relying on the information it collects at the time of SIM registration to open bank accounts. This will be cross-referenced with the national ID

[68] GSMA, di Castri, S., 2013, *Mobile Money: enabling regulatory solutions*, available here.

[69] MTN Annual report 2015.

[70] In 2015, MTN was fined in Nigeria for failing to register subscribers.

system to meet CBA's KYC requirements under the financial legislation, and enable lending over MTN's mobile money platform.[71]

As the functionality of such systems are developed and regulation is tailored to match restrictions to the kind and scale of risk involved, the gap between the protectiveness of financial regulation and the financial inclusion opportunity narrows. The Financial Action Task Force (FATF) requires countries to follow a risk-based approach to regulation.[72] Such an approach allows for applying lighter transaction and balance limits and automated transaction monitoring systems for lower-risk services, such as plain mobile money transfer and payments, while imposing more stringent identification and verification requirements for higher-risk services.

3.3 Agent network issues

3.3.1 Liberalising agent networks

As explained in section 3.1, mobile money services are 'two-sided platforms' – they bring together users and agents to create value for each group. Agents are the direct human interface of mobile money with the customer, and agent networks are the backbone of the service for cash-in and cash-out transactions, as well as often assisting with transfers and payments. An extensive agent network is thus centrally important to mobile financial services, just as it is for prepaid telecommunications services.

Agents are responsible for more than 90% of cash-in and cash-out transactions (ATMs and bank branches make up the remainder), illustrating how indispensable they are to mobile money services. They compete with bank branches and ATMs for cash-in, cash-out and other transactions, but do not have the same capital investment costs. They can provide a variety of services in addition to cash-in and cash-out, such as account opening, bill payments, assistance with remittances, G2P payments, insurance, airtime top-up and credit. Innovation at the agent level is important in developing the variety of services available to the population.

Agents present by far the largest operating cost of a typical mobile money provider. In addition to agent recruitment and training, it has been estimated that the largest 10 mobile money providers pay on average 54.4% of revenues in agent commissions for customer

[71] Section 7 of Uganda's Financial Institutions (Anti- Money Laundering) Regulations, No 46 of 2010.

[72] The first of the FATF's 40 recommendations provides "Countries should identify, assess, and understand the money laundering and terrorist financing risks for the country, and should take action, including designating an authority or mechanism to coordinate actions to assess risks, and apply resources, aimed at ensuring the risks are mitigated effectively. Based on that assessment, countries should apply a risk-based approach (RBA) to ensure that measures to prevent or mitigate money laundering and terrorist financing are commensurate with the risks identified. This approach should be an essential foundation to efficient allocation of resources across the anti-money laundering and countering the financing of terrorism (AML/CFT) regime and the implementation of riskbased measures throughout the FATF Recommendations. Where countries identify higher risks, they should ensure that their AML/CFT regime adequately addresses such risks. Where countries identify lower risks, they may decide to allow simplified measures for some of the FATF Recommendations under certain conditions." Financial Action Task Force, February 2012, *International Standards on Combatting Money Laundering and the Financing of Terrorism*, available here.

registrations and cash-in and cash-out transactions. Commissions in the first year or two can exceed 350% of revenue given the need to sign up customers.[73]

To achieve the necessary scale to enable network effects to take off, mobile money providers must rely on third party agents – shops, airtime resellers and others – to deal with their customers, and even trust them with the customers' money. In India, for example, the Helix Institute, which is involved in efforts to develop agent networks in many countries, found that 22% of agents were also mobile money agents, but 86% were shop owners.[74]

As with branchless banking generally, agent networks enable the mobile money provider to operate with far greater coverage than, and without the capital and operating costs of, bricks and mortar bank branches.

Traditionally, regulators limited financial institutions' delegation of customer-facing functions, for example requiring them to be registered legal entities with a business licence or minimum amount of capital. However, as a better understanding of the risks associated with agents has evolved, and weighed against the opportunity to drive financial inclusion, regulation of agents has lightened such requirements. This is relevant both to banks seeking to engage in 'branchless banking' and to mobile money providers.

For example, early in 2016, Uganda amended its Financial Institutions Act 2004 to allow banks to offer banking services through agents. This liberates banks to increase geographic coverage of their services at far lower cost. This liberalisation coincides with the imminent entry into the savings and loans market of the mobile money providers, and can be expected to spur competition between them in mobile banking. Such competition can be expected to drive financial inclusion to people who previously had no access to lending from the formal financial sector.

Regulators commonly require mobile money providers to carry out due diligence on their agents when selecting them, notify the financial regulator of their appointed agents, train them (e.g., not only to provide agent services but also to spot fraud and abuse), and supervise their activities. Thus the mobile money provider acts as the intermediary between the regulator and the customer interface.

A key question regarding agent networks is whether the mobile money provider (or the bank in the case of branchless banking) should be liable for the behaviour of the agent in the classic principal-agent sense. Such liability reassures the regulator and consumers and leads to lighter restrictions on agent requirements, such as agent eligibility, due diligence requirements in selecting them, and location restrictions. For this reason, the mobile money provider's liability for the agent's conduct may be required by regulation.[75]

However, there are strong arguments that agent networks should be liberalised even further. It has been suggested that they need not be treated as legal representatives of the mobile money provider when it comes to cash-in and cash-out. The agent is not actually issuing money or managing the customer's money. He or she is merely exchanging physical money with

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[73] GSMA 2014, Mobile money profitability: A digital ecosystem to drive healthy margins.

[74] Helix Institute, 2015, *Agent Network Accelerator Survey: India Country Report 2015*, available here.

[75] For example, Uganda's Mobile Money Guidelines provide in section 7(3)(b)(i) that a mobile money provider must "Enter into an agreement with the agent stipulating the responsibilities of both parties. The said agreement should not provide for exclusivity and should clearly state that the mobile money service provider shall be liable for the actions of its agents as regards to the provision of mobile money services."

electronic money on the mobile wallet.[76] These arguments may well gain traction as regulators develop experience and are better able to assess the risks associated with agent activities. They may lead to greater liberalisation of the agent market, increasing geographic coverage, speed and quality of service.

Agents do present some risks to consumers using cash-in and cash-out services, such as fraud, lack of liquidity, as well as poor explanation of the service, and of course error. Such risks might be mitigated through a separate licensing arrangement instead of requiring mobile money providers to be liable for agent behaviour. Development of independent agent networks might ensue, with greater flexibility in their delivery of cash-in and cash-out services for a number of mobile money service providers, potentially increasing competition among service providers themselves.

3.3.2 Agent exclusivity

As explained in section 3.3.1, a strong agent network is necessary for the mobile money business to succeed. It depends on physical persons ready to receive cash in a cash-in transaction, or provide cash for cash-out transactions. The enterprising mobile money provider able to establish the first and secure the widest coverage of agents has a significant competitive advantage over entrants that still have to grow their agent network.

Encouraging providers to be the first mover is an important element in competition law and policy, including in sectors such as finance and telecommunications. Innovation in agent networks has been an important competitive factor. In Uganda, MTN was able to get out ahead of any competitors partly because it decided not to restrict its agent network to its existing retailers, but to allow a wide range of individuals to become its agents.

Building an agent network involves substantial upfront costs in recruitment and training, and ongoing costs in commissions and supervision. It may also involve transfer of 'know-how.' Firms that make such investment and achieve an extensive agent network may argue that they need to recoup their investment, and that their competitors should not be able to 'piggy-back' on their investments by engaging the same agents. After all, a second firm, finding agents that have already been recruited (identified, evaluated, contracted) and trained in the mobile money business by the first firm, will face lower upfront costs. For these reasons, leading firms may wish to ensure that their agents act exclusively for them, and exclusivity is common, protecting their incentive to invest. Like many countries, Nicaragua for example has agent exclusivity. Some countries have a particularly high incidence of agent exclusivity. In India, for example, 89% of agents are exclusive to one mobile money provider (However, where the leading mobile

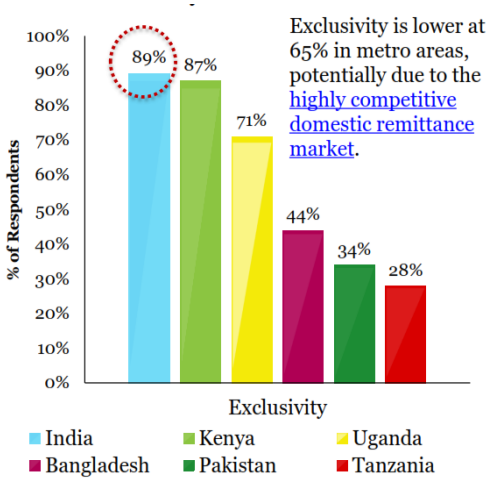
[76] In a cash-in transaction, the customer transfers physical cash to the agent and the agent transfers electronic money to the customer's mobile wallet. In a cash-out transaction, the transfer of the two forms of monetary value happens the other way round. The agent handles his or her float of cash to ensure he or she has sufficient electronic liquidity to transfer electronic money into customers' mobile wallets when cashing in, and enough physical cash liquidity to meet cash-out requests. The mobile money provider (or bank, in branchless banking) supplies the technology platform that carries out the electronic side of the transaction by guaranteeing the amount held on account by each party and recording the electronic transfer. The mobile money provider (or bank) is not actually a party to the transaction, and is not actually handling the mobile money provider's or the customer's money. It has been suggested that this is no different from a shop selling rice in exchange for cash, except that it is selling an electronic transfer. This is quite different from the situation where a customer deposits cash at or withdraws cash from a bank branch, where the teller takes possession of the cash on behalf of the bank and credits the customer's account. See Mas, I, 29 July 2014, *Shifting branchless banking regulation from enabling to fostering competition*, available here.

money provider enters into exclusive arrangements with agents, this may foreclose competition. It may violate the competition laws, or the competition provisions of financial or telecommunications laws.

Figure 15).[77]

However, where the leading mobile money provider enters into exclusive arrangements with agents, this may foreclose competition. It may violate the competition laws, or the competition provisions of financial or telecommunications laws.

Figure 15. Exclusivity in Helix Agent Network Accelerator countries



Source: Helix Institute, 2015, Agent Network Accelerator Survey: India Country Report 2015, available here.

Exclusive agreements with downstream distributors of a given product or service are not always regarded as anticompetitive, as sometimes there may be justifications for them. For example, franchise agreements (e.g., fast food restaurants) are a common business model where the franchisor (supplier) will typically license to the franchisee (distributor) various intellectual property rights, such as trade-marks and know-how, for the distribution of the specific types of goods or services. The franchisor will often provide training and ongoing support throughout the contract. In these cases, exclusive distributorship and single branding will often form a legitimate part of the agreement.

There are several factors to consider when determining whether a mobile money provider should be allowed to restrain its agents from being agents for a competing mobile money provider. Clearly an exclusivity arrangement limits competition – that is the very purpose.

The degree of market power of the mobile money provider will directly affect whether agent exclusivity produces an anticompetitive impact. The competition concerns are greater if the mobile money provider has stronger market power, because the unavailability of substitute services makes it more important to ensure some degree of competition at the customer-facing layer of the business.

The impact of agent exclusivity is not merely in making the first mobile money provider's agents unavailable. In many cases, these agents will in reality be the only agents that are economically feasible for the second, third and later mobile money providers to engage.

[77] Helix Institute, 2015, *Agent Network Accelerator Survey: India Country Report 2015*, available here.

This is because the business of being an agent depends upon sufficient scale of transactions to generate commissions. It is often not a very profitable business. Where one firm has achieved a large share in the market, the volumes of transactions carried by its competitors are lower. As a result, retailers and individuals may not be able to generate significant revenue by acting as agents for the larger firm's competitors. The smaller rivals may thus be unable to attract other agents.

It may then only be economically possible to build a substantial agent network using agents that already have a core revenue flow from the market leader's business. For such agents, adding another mobile money provider is a small enough incremental effort to be worth the small amount of additional revenue available from the competitor's commissions. In addition, if the larger firm has secured the most attractive locations – key retailers and corner kiosks – then there may not be a physical alternative to its agent.

Restricting agents to a single mobile money provider may thus restrict competition. This may result in a lack of competitive pressure on the leading provider to improve quality and variety in its services, to innovate, or to keep prices down. In Peru, CGAP found that "agent exclusivity can have a negative impact on potential for growth."[78] It may reduce the variety of services an agent may offer, and reduce the number of potential access points. This may mean, particularly in rural areas, that the population will have less access to services.

Thus agent exclusivity commitments to a larger mobile money provider can be a major impediment to its competitors' ability to build a viable rival business. As network effects take root, barriers between networks may be impregnable, and the unavailability of agents may cement market leadership, resulting in a single dominant player.

Box 5. Regulating exclusive agent arrangements

In countries where regulators are wrestling with the dominance of the market leaders, they have sought to tackle agent exclusivity. Zimbabwe, for example, recognises the competition problem of exclusivity arrangements, but has not ruled them out entirely and requires justification for them. For instance, in 2014 the Reserve Bank of Zimbabwe (RBZ) issued a National Payment Systems Directive[79] that provides: "Where a payment system provider requires entering into exclusive arrangements with an agent, the payment system provider shall apply to the Reserve Bank justifying why such an agreement is necessary." Justifications could include, for example, where the mobile money provider owns the agent shop.

Other countries have simply prohibited agent exclusivity. For example, the Regulatory Framework for Mobile Payment Systems in Nigeria, 2009 provides that the agents are not restricted to any one scheme operator and can serve as agents to multiple operators.

In Kenya, until 2014, Safaricom prevented its agents from being agents for other mobile money providers. Following a complaint by Airtel, the Competition Authority of Kenya (CAK) investigated the practice, found it to violate the Competition Act, and ordered Safaricom to allow its agents to be agents for competitors.[80] Around the same time, the Central Bank of

[78] Faz, X. and García Arabéhéty, P., CGAP, January 2015, *Driving Scale and Density of Agent Networks in Perú*, available here.

[79] Reserve Bank of Zimbabwe, NPS 01/2014, paragraphs 4 and 5, available here.

[80] Ochieng, L. 2014. "CAK Orders Safaricom to Open up M-Pesa." *Daily Nation*, 27 July, available here.

Kenya also issued regulations prohibiting exclusivity.[81] Similarly, in Uganda, the Bank of Uganda's Mobile Money Guidelines, adopted in 2013, prohibit agent exclusivity.[82]

Pakistan's Branchless Banking Regulations for Financial Institutions Desirous to Undertake Branchless Banking (31 March 2008) provide that one agent can provide services to multiple banks provided the agent has a separate service level agreement with each bank.

Enforcement of such prohibitions is important, as in some countries, agents of a leading provider may still come under pressure not to become agents of a competitor. There have been reports of regional agent managers monitoring agents and threatening to terminate their agency agreements if they become agent for another mobile money provider. Physical harm to publicity, kiosks and individuals has also at times been used. In some countries, many agents are unaware that they are at liberty to act as agents for competitors. Public information campaigns may thus be needed to ensure prohibitions on exclusivity are effective. Large numbers of agents remain exclusive to one provider in practice.[83]

Transition from exclusive arrangements to a non-exclusive market may thus take time and effort, including on the part of the regulators. A competition authority, if the country has one, may be well suited to pursue monitoring and enforcement due to its core business of active monitoring of retail markets, use of mystery shopping and complaints hotlines.

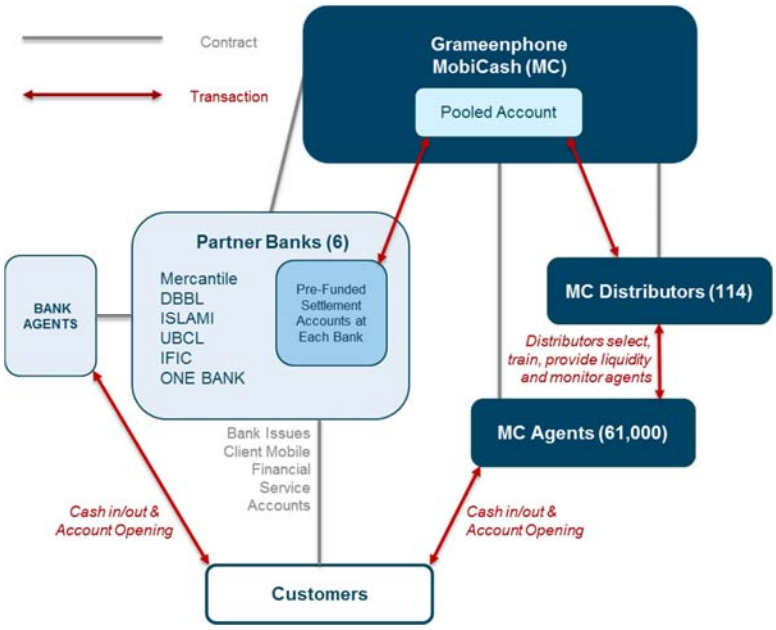
Models for active agent network sharing are arising. Bangladesh, Nigeria and Peru have each seen the development of shared agent networks where agents act seamlessly receiving cash-in and providing cash-out for many different providers of mobile financial services (**Figure 16**).

[81] Kenya's National Payment System Regulations prohibit agent exclusivity in Section 15.2: "No contract for the provision of retail cash services between an electronic retail payment service provider and an agent or cash merchant shall be exclusive." Section 15.3 allows agents to work for multiple financial institutions.

[82] See footnote 75.

[83] See for example, CGAP, 23 March 2013, Mas, I. and John, A., *Mobile Money Agents in Tanzania: How Busy, How Exclusive?* Available here.

Figure 16. MobiCash shared agent network in Banlgadesh



Source: Noor, W. and Shrader, L., CGAP, 24 February 2015, MobiCash shared agent network – Bangladesh, available here.

Box 6. Shared agent networks in Bangladesh[84]

Grameenphone in Bangladesh operates MobiCash, which has built an agent network of over 60,000 agents and acts as agent for several banks, including DBBL, One Bank (which operates OK), Mercantile Bank (which operates MyCash), Islami Bank (which operates mCash) and UBCL (which operates UCash) which have over 6 million customer accounts. For these banks and their customers, MobiCask registers customers with new accounts, provides cash-in and cash-out services, as well as bill payments, and the banks interact electronically with the customers using Grameenphone's USSD and SMS channels (see **Figure 16**). The combination of Grameenphone's telecommunications network and MobiCash's agent network allows these other mobile financial service providers to mount a challenge to the country's leading provider bKash.

3.4 Telecommunications network access issues

Mobile financial services are provided over the mobile telecommunications network. MNOs control the networks so other providers of mobile financial services must rely on the MNOs for access to these networks and customer devices. Such providers are thus both competitors and customers of the MNOs.

This potential conflict of interest in the MNOs exposes competing providers to the risk that MNOs restrict access to the communications channels. This is a serious risk because mobile networks are already a concentrated market, with only a few of them in each country. MNOs that are dominant in the mobile telecommunications market and aspire to grow (or protect market position) in mobile financial services may have both the ability and the incentive to exclude competitors from or increase their costs in the mobile financial services market. As

[84] Noor, W. and Shrader, L., CGAP, 12 March 2015, *Telenor's Shared Agents: Digital Finance Catalyst for Bangladesh?*, available here.

with the harm to consumers from dominant providers operating exclusive agent networks (see section 3.3.2), the harm from MNOs excluding competitors from the market or increasing their costs includes weaker innovation, a narrower range of available services, and higher prices.

3.4.1 Communications technology delivery channels

There is a range of communication channels available for provision of and access to mobile financial services. The desirability of a given technology in a given market depends on its compatibility with available handsets, user experience, security, cost, and ease of deployment.[85] Today, mobile money is chiefly accessed through the human interface of the agent in the street and the technical interface of the feature phone. The most commonly used access technologies are:

- USSD
- STK
- Internet

3.4.1.1 *Unstructured Supplementary Service Data (USSD)*

Most large scale mobile financial services in developing countries rely on USSD as their primary mechanism for connectivity with customers.[86]

USSD is a standard for transmitting information over a GSM network. It functions on the vast majority of feature phones and smartphones.[87] Delivery of services over USSD does not require programming changes in or access to a handset's SIM card. This allows non-MNOs and non-MVNOs to provide mobile financial services, and makes interoperability across different MNOs easier.[88]

However, USSD does not offer the same security capabilities as STK or mobile internet (described below).[89] The customer experience is also typically not as smooth as STK, with USSD having a higher risk of dropped sessions. Where customers are charged for usage, this can undermine trust and raise costs.[90] USSD is typically cheaper than SMS because it provides a session-based connection that is real-time and significantly faster and cheaper than SMS for two-way transactions.[91] To provide mobile financial services via USSD on an MNO's network, the provider requires a designated short code. The customer dials this (e.g., '*100#') and is then

[85] Hanouch, M. and Chen, G. (February 2015), 'Promoting competition in mobile payments: The role of USSD,' CGAP Brief.

[86] Hanouch, M. (2015) 'What is USSD & Why does it Matter for Mobile Financial Services?,' CGAP blog post, available here. Also see GSMA, 2014

[87] Hanouch and Chen (2015), cited above.

[88] USAID, 2010.

[89] Hanouch and Chen (2015), cited above.

[90] Hanouch and Chen (2015), cited above.

[91] Sanganagouda, 2011.

presented with a menu of options and communicates back and forth according to his or her selections.[92]

USSD codes may either be assigned by the MNO or the telecom regulator, depending on the jurisdiction. In Tanzania and Uganda, they are assigned by the regulator while in Kenya, USSD short codes are assigned to MNOs who may in turn provide secondary assignments to non-MNOs. Some have raised concerns that where the operators provide such secondary assignments these expose the mobile money providers further to the market power of the MNOs, with risks of delay and other impediments.

3.4.1.2 *SIM Application Toolkit (STK)*

STK-based interfaces comprise a set of commands programmed onto the user's SIM card. The menu for accessing the commands is embedded in the normal phone user interface, accessible on the phone's menu.[93] The programmed SIM determine how the SIM should interact with the outside world.[94] This makes it more secure than USSD and SMS (even though it operates over those technologies).[95] To use STK, a provider of mobile financial services needs access to programme the SIM card. Mobile financial service providers that are not MNOs or MVNOs (which control such access) typically do not have access.[96] STK functions on feature phones and smartphones, making it attractive for deployment in low-income regions.

3.4.1.3 *Internet*

Mobile financial services are also available through an internet connection. The versatility of the internet makes it highly attractive for such services. It also allows services to be 'network agnostic', i.e., the service provider need not have any affiliation with the MNO. For example, Uganda's UTL and MTN have developed mobile money applications that will work on their competitors' mobile networks.[97] Access through the internet should reduce many of the competition problems arising from MNOs' market power through control of USSD and STK on the GSM networks, as discussed in section 3.4.3.

3.4.1.4 *Other technologies*

Other possible technologies include SMS, interactive voice response (IVR), where the system interacts with the customer through the use of voice and signalling tones input on the keypad, and near field communications (NFC). These are far less used in developing countries for mobile financial services and so are less relevant to financial inclusion.

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[92] Camner, G., Pulver, C. and Sjöblom, E. (2012). 'What makes a successful mobile money implementation? Learnings from M-Pesa in Kenya and Tanzania'. GSMA.

[93] USAID (2010). 'FS Series #9: Enabling mobile money interventions: primer, diagnostic checklist, and model scopes of work'. Prepared by Chemonics International Inc. for the United States Agency for International Development (USAID) Financial Sector Knowledge Sharing Project. Available here,

[94] USAID (2010), cited above.

[95] Singh, G. et al 'Mobile Payments Infrastructure Access and Its Regulation: USSD.' CGAP Working Paper (May 2014).

[96] Hanouch and Chen (2015), cited above.

[97] Najjemba, I., 15 November 2015, pctechmag.com, Mobile Money: Transforming Lives, One Transaction at a Time, available here.

3.4.2 Anticompetitive practices

Mobile telecommunications networks are a 'bottleneck resource' in that they cannot be cost-effectively duplicated. A MNO may have two potentially conflicting incentives:

- to increase wholesale demand for its upstream telecommunications network services through encouraging value-added use by third parties, such as mobile money providers; and
- to protect its position from actual and potential rivals in the downstream retail mobile money market.

However, there is a feedback loop from the retail mobile money market into the retail mobile telecommunications market. Where an MNO operates a dominant mobile money business, it has a strong incentive to channel demand to its own transfer and payment services. By maintaining and strengthening its position in the mobile money market, the firm also strengthens its position in the mobile telecommunications market because the subscribers need the latter to obtain the former.

MNOs can use their market power over communications channels to leverage network effects to prevent competitors gaining traction in the downstream mobile money market. Strategies include refusing to provide USSD to competitors, offering prices which squeeze the competitors' margins to make their business commercially unviable, and discriminating in pricing and other terms.[98]

The harm can extend right into all areas of the mobile financial services market. For instance, if banks seek to offer their services across mobile networks in competition rather than partnership with the MNO, the development of mobile savings and lending services may be impeded.

3.4.2.1 *Refusal to supply*

In some cases, MNOs simply refuse to supply competing mobile money providers, or delay supply based on justifications such as lack of capacity or technical readiness.

In Zambia, for example, MTN was fined by the competition authority for restricting access to USSD of Zoona, a major payments competitor. In Zimbabwe, Econet is being investigated by the Competition and Tariff Commission (CTC) for potential breaches of the Competition Act. The banks complain that, after a period of refusal to supply USSD access, the access Econet did eventually set for customers accessing the banks' services is at a higher price than Econoet charges customers who are connected to its mobile money service EcoCash.

A mobile money provider that is not able to obtain access to the network channels required directly from the MNO might seek to use an aggregator which can provide it with access to several MNOs, possibly on better terms because the MNO may not initially be aware that the mobile money provider is behind the aggregator. However, this strategy may not succeed where the MNO learns that the aggregator is making network access available to the competing mobile money provider. In some cases, MNOs have even threatened the

[98] See Rey, P. and J. Tirole. (2007). 'A Primer on Foreclosure' in M. Armstrong and R. Porter (eds). *Handbook of Industrial Organisation III.*

aggregator with cutting off network access if it finds the aggregator is supplying a competing mobile money provider.[99]

3.4.2.2 *Excessive and discriminatory pricing*

Charges for use of the telecommunications network for mobile financial services vary. In the case of USSD, the most commonly used channel, the MNO may charge the mobile money provider and the customer nothing for a USSD session, which is more likely if the financial service is provided under a partnership between the MNO and the provider. Other times, the MNO will charge the customer, in which case the charge (although paid by the customer) is typically negotiated between the MNO and the mobile money provider. On other occasions, the MNO may charge the customer nothing but charge the mobile financial service provider a negotiated price. Sometimes that provider will pass the charge through to the customer, but other times it will simply absorb it in order not to discourage the customer from using the service.

Increasingly, MNOs are partnering with financial institutions to provide a broader array of mobile financial services. Different commercial models are used, though a common model is to share the revenue generated by the service. In such cases, the MNO may have an incentive to provide better pricing and other conditions of access to their network services than competitors of the partners. This might include removing usage based charges, for instance.[100] Such zero-rated pricing may provide a competitive advantage over other providers of similar financial services where the provider or end-users have to pay based on usage.

The MNO may discriminate in favour of partner providers of mobile financial services as well as aggregators that bring it larger volumes of business than it will itself generate. In many countries' competition laws and competition provisions of telecommunications laws, such discriminatory practices may be unlawful if they distort or harm competition.

As a result, some mobile money providers have abandoned efforts to use the dominant MNO's USSD services and have instead established themselves as MVNOs. In Kenya, Equity Bank reportedly launched Equitel, an MVNO operating over Airtel's network, chiefly in order to provide mobile financial services without the high costs imposed by dependence on competitor Safaricom's USSD prices.[101]

3.4.2.3 *Margin squeeze*

An MNO may not only discriminate in pricing, but may even impose a margin squeeze. A 'margin squeeze' occurs when an MNO charges a rival mobile money provider a wholesale price for its network service (typically USSD) that does not leave the rival enough of a

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[99] For example, in *EzeeMoney v MTN*, the Commercial Court in Uganda found that MTN had threatened Yo! Uganda Ltd. because it was supplying MTN's USSD connection to mobile money provider EzeeMoney. In November 2015, MTN was fined UGX 2.3 billion ($ 662,000) for anti-competitive conduct. The Commercial Court found that MTN had breached section 53(1) of the Uganda Communications Commission (UCC) Act 2013 which prohibits an operator from "(engaging) in any activities which have, or are intended or are likely to have, the effect of unfairly preventing, restricting or distorting competition in relation to any business activity relating to communication services". See Kiyonga, D. (2015). MTN fined Shs 2.3bn for sabotaging competition. *The Observer*, available here.

[100] M-Shwari and KCB M-Pesa in Kenya both operate without usage-based charges for using Safaricom's STK and USSD channels, respectively.

[101] Mas, Ignacio, and John Staley. CGAP, 18 June 2014, *Why Equity Bank Felt It Had to Become a Telco—Reluctantly*, available here.

margin between the wholesale price and the retail price in the market for money transfers and payments to make the supply of such downstream retail services commercially viable.[102]

Margin squeeze is commonly recognised as an anticompetitive strategy to raise the MNO's rivals' costs, whether just to give itself or its partners a competitive advantage or to exclude the rivals outright from the market. There are signs of margin squeezes being imposed by several dominant MNOs on their competitors.

Where the practices embed network effects enjoyed by a leading player, they can remove much of the threat from competition 'on the merits', i.e., on the basis of the actual price, quality, variety or innovation of its services.[103]

3.4.3 Evolution of network access issues

The ability of a MNO to act anticompetitively in its pricing or provision of telecommunications network services should diminish as smartphone penetration rises, mobile data prices fall and applications are developed. The customer will be able to access his or her mobile money provider directly over the internet rather than STK or USSD, so providers will be able to connect with them directly rather than acquiring a dedicated link using USSD channels.

In some countries, smartphone penetration is growing quickly, which is hopeful.[104] However, feature phones remain far more common than smartphones in lower income developing countries. In 2015, countries with a high percentage of unbanked adults still did not have strong smartphone or mobile broadband penetration, making the internet unavailable for delivering mobile financial services to drive financial inclusion. And even in 2020, large parts of the population – predominantly the lower income users who are also financially excluded – are expected still to be using feature phones. So long as this is so, USSD and STK will remain the most important platforms for the purposes of financial inclusion, and non-MNO mobile money providers will remain dependent on the MNOs for access.

Even when access via the internet becomes used ubiquitously by most of the population, competition problems may still arise. A MNO might proactively throttle or deny access to a competing mobile money provider's websites or applications, or zero rate access to its own or its partners' mobile money websites or application. How serious these issues will be remains to be seen, and it may be premature to intervene at this stage before such problems surface. Although these may remain important competition concerns, they are unlikely to be as severe as the current actual and constructive refusals to supply and excessive, discriminatory margin-squeeze pricing USSD that is happening today.

3.4.4 Remedies

Addressing anticompetitive behaviour and network access problems requires intervention under the competition law, if there is one, or provisions of the telecommunications law – or

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[102] Padilla & O'Donoghue. (2013). *The law and economics of article 102 TFEU*. 2nd edition.

[103] For instance, Tanzania, whose market is characterised by significant competition in mobile telecommunications and money services, enjoys lower prices for mobile money services than Kenya's, which is dominated by Safaricom.

[104] Already today, India has 185 million smartphone connections in the middle of 2015, which the GSMA expects to grow by half a billion by 2020. In Kenya, Safaricom reported that in the 2014-5 financial year, the number of its users with smartphones grew by 98% to 3.4m through provision of low cost smartphones. Safaricom 2015 results, available here.

both. Telecommunications regulators sometimes express some hesitancy to intervene, uncertain whether they have the legal authority to regulate mobile money related issues. However, this typically arises either out of confusion about the specific problem at hand, or political pressure not to intervene. The provision of wholesale network access, whether STK, USSD or internet, is a telecommunications service and governed by the given country's telecommunications sector laws. These typically include regulatory powers to intervene in questions of dominance, wholesale and retail pricing, and other conditions of service.

USSD channels have rarely been the major focus of a telecommunications regulator. They support value added services that are peripheral to a telecommunications operator's core business. However, as mobile money grows in importance, they may actually merit high priority in some cases.[105] Exclusion of mobile money competitors can support and embed a vicious circle of network effects in both the mobile money and telecommunications sectors, which risks entrenching dominance deeply.

Some countries' courts and regulators are beginning to react. The Telecommunications Regulatory Authority of India (TRAI) was the first to carry out a full price regulation proceeding in 2013 regarding provision of USSD for mobile money services.[106] The purpose of the proceeding was expressly "to design a mechanism and determine the terms and conditions under which mobile banking for financial inclusion can be facilitated" and set a price ceiling for USSD sessions.

India's is a bank-led model of mobile money, and thus mobile operators in India have less opportunity to drive mobile money growth. USSD pricing practices may be more extortionary than exclusionary. In countries with MNO-led models of mobile money, growth has been far stronger, and in face of this success regulators have been far more hesitant to intervene. While such instincts reflect the expert narrative, which advocates caution when intervening in mobile money regulation, it does not reflect the common attitude to regulating telecommunications services prices, which in many countries is to control them, particularly when subject to dominant market power.

Also in 2013, Peru's Supervisory Agency for Private Investment in Telecommunications (Osiptel) issued Standards Relating to Access by Electronic Money Issuers to Telecommunications Services.[107] These specifically address non-discriminatory pricing and terms of access to telecommunications network services for electronic money providers, including a 60-day negotiation period for negotiation after which Ospitel can be called upon to determine pricing and terms of access.[108] As discussed in Box 7, Uganda's communications regulator has identified the USSD market as appropriate for regulation. The Competition Authority of Kenya is currently carrying out a market inquiry into the pricing and conditions of access to the USSD channels, in particular for mobile money.[109]

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[105] Hanouch, M., CGAP, 17 February 2015, *What is USSD & Why Does it Matter for Mobile Financial Services?* available here.

[106] The Telecommunication Tariff (Fifty Sixth Amendment) Order, 2013 No. 5 of 2013

[107] Sitbon, E. (2015) 'Addressing competition bottlenecks in digital financial ecosystems', *Journal of Payments Strategy & Systems*.

[108] Supervisory Agency for Private Investment in Telecommunications (Osiptel), Standards Relating to Access by Electronic Money Issuers to Telecommunications Services 2013. See https://www.osiptel.gob.pe/ and here.

[109] Kenyan Gazette Notice No. 3829, as published in The Kenya Gazette, 29 May 2015.

Box 7. Uganda's communications and USSD market review

The Uganda Communications Commission (UCC) recently carried out a market review of telecommunications that found the MNOs to have significant market power in the provision of USSD services, and recommended consideration of various regulatory remedies.[110] It found that MNOs that supply access to USSD codes have the ability and incentive to limit competitive entry in the retail USSD market, price access to USSD excessively and provide poor quality service with compensation.

The UCC is now considering a number of potential remedies to address competition problems in the USSD market and their impact on mobile financial services. Remedies that were recommended for consideration (subject to a cost-benefit analysis) included:

--requiring MNOs to obtain UCC approval of USSD agreements;

--requiring MNOs to prepare UCC-regulated USSD reference offers;

--MNO obligations to meet all reasonable requests for interconnection in a fair, reasonable and non-discriminatory manner;

--account separation;

--charging for USSD on a cost-oriented basis and establishing reference rates (i.e., price caps);

--reporting USSD traffic usage and charges; and

--establishing of a dispute resolution service to resolve billing disagreements between a MNO and the service provider acquiring USSD services from it.

This represents a very typical array of remedies used to regulate wholesale telecommunications. Naturally, selecting which to apply is a question of fitting the remedies to the problem in a proportionate manner. Ultimately, network access problems can and should be addressed by the telecommunications regulator executing its statutory mandate.

Price regulation need not necessarily require a full blown cost accounting exercise for USSD services. Price regulation can involve pricing rationally related to cost, prior approval of prices, setting a price cap or fixing prices, in each case depending on information on costs and benchmarks. The key objective in the case of USSD services will typically be to ensure that the pricing is not actively distorting competition in the important mobile financial services markets.

Timing factors should also take into account the development of the smartphone market, which as discussed in section 3.4.3 should reduce the connectivity problem. Until then, however, the flow-through impact on the mobile financial services of not acting may in some countries merit eliminating problems arising from USSD pricing. This means in particular that prices should not be permitted to impose a margin squeeze on competing mobile money providers or discourage users from using the service if they (rather than the mobile money provider) are paying the USSD charges. In some cases, it may suffice just to get the USSD price down to a level low enough not to affect consumer choices and not to hurt a competitor's margins.

[110] Ugandan Communications Commission, Cartesian, 2015, *Mobile Platform Access for USSD-based Applications (MPA-USSD): Market Assessment*. Available here.

3.5 Account-to-account interoperability issues

3.5.1 Account-to-account interoperability

Mobile financial services operate through accounts, whether mobile wallets or bank deposit or bank loan accounts. Account-to-account interoperability is the ability to transfer funds from one account to another.[111] It enables "transfers between customer accounts at different mobile money schemes and between accounts at mobile money schemes and accounts at banks."[112] Its utility is in enabling users "to make electronic payment transactions with any other user in a convenient, affordable, fast, seamless and secure way via a single transaction account."[113]

Institutions typically allow interoperability between accounts of an individual, and between accounts of different individuals with the same institution. Today, in most countries, there is extensive interoperability among bank accounts. As banks have entered the mobile money market, and particularly as partnerships among banks and MNOs have developed, interoperability between bank accounts and mobile wallets has become common. However, interoperability between mobile wallets of different providers is not the norm. Most mobile money providers still only allow transactions between accounts belonging to their own mobile subscribers, i.e., on-net transfers.

Interoperability between mobile wallets is important in markets where MNOs' mobile money services are leading the development of the market because of network effects and the market power of the MNOs. The ITU's Focus Group on Digital Financial Services is thus focusing on interoperability, including developing a toolkit.[114]

3.5.2 Network effects and interoperability

Network effects were introduced in section 3.1. In telecommunications, regulators aim to ensure that networks interoperate seamlessly. This enables the networks to combine their network effects so that all users can communicate with all others regardless of the network to which they are subscribed. Without such interoperability, a larger network will have such a competitive advantage that it may be impossible for smaller networks to grow market share. This made interconnection fundamental to the introduction of competition in telecommunications markets.

Even where networks are interconnected, those with a smaller customer base may be prevented from competing by certain pricing strategies of those with a larger customer base. Large networks sometimes exploit network effects to preserve and deepen their market power

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[111] This is to be distinguished from sharing of agents, whereby an agent may perform cash-in and cash-out transactions for multiple mobile money providers and network neutrality whereby customers can access the same mobile financial services through different MNOs. Kumar, K and Tarazi, M. (January 2012), 'Interoperability in Branchless Banking and Mibole Money,' CGAP, available here.

[112] Clark, D and Gunnar C. (February 2014), 'A2A Interoperability, Making Mobile Money Schemes Interoperate,' GSMA at 4, available here.

[113] Aylward, C. et al. (September 2015), 'Review of Interoperability and Regulations of Mobile Money, EPAR Request No. 313,' Evans School Policy Analysis and Research (EPAR), Evans School of public Policy and Governance, University of Washington at 2, (citing ITU Focus Group on Digital Financial Services (2015), Output Document, International Telecommunications Union.)

[114] See here.

by using low on-net prices and higher off-net prices. This makes it significantly more expensive for their retail customers to call customers on other networks than to call on the same network.[115] This makes the larger network more attractive for customers, and where the larger network is dominant, a large price differential between off-net and on-net calls can harm competition. Such practices have sometimes been deemed to be anti-competitive.

As a network service, mobile money encounters similar issues. If customers of the largest mobile money provider cannot send and receive money to and from mobile money providers that have a smaller subscriber base, the latter are less useful and attractive to customers.

A lack of account-to-account interoperability in mobile money imposes inconvenience, cost and inflexibility on users:

- ***Inconvenience:*** The recipient cannot receive the money in his or her mobile wallet, and can only obtain the funds by physical withdrawal from the sending mobile money provider's agent. The recipient must locate and visit the agent, and depends on the agent being available and having sufficient cash.
- ***Cost:*** On top of this inconvenience, additional charges may apply to the sending user for such transfers and to the recipient for the cash withdrawal – amounts that would not apply in a simple account-to-account transfer.
- ***Inflexibility:*** This service is typically not available for transfer values below a certain value, making it less convenient than transferring between mobile wallets.

All of these factors make it far more desirable for senders and recipients to hold accounts with the same provider, typically the leading one. This may be one reason why many subscribers in countries with significant mobile money businesses will hold more than one subscription.

Where interoperability is not in place between mobile money providers (or where charges for cross-network transactions are high), it can be very difficult for alternative providers to build market share after the first provider has attracted a critical mass of customers. Mobile money markets therefore face a 'winner takes all' outcome resulting from 'competition for the market'. [116]

While this is resolved in telecommunications through interconnection regulation, the problem remains in mobile money. One might say that in telecommunications, network effects externalities are 'socialised' (i.e., shared across networks through interconnection, and passed through to users), while in mobile money and other platform services the externalities are 'privatised' (i.e., enjoyed by the successful platform operator).

Furthermore, where the mobile money provider is a MNO, it may be able to exploit network effects in both telecommunications and mobile money. The combination of mobile money network effects and telecommunications network effects poses difficult problems.[117] The

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[115] See, for example, Laffont, J., Rey, P., and Tirole, J. (1998). 'Network competition II: Price discrimination'. *Rand Journal of Economics*. Vol. 29, no. 1.

[116] Bourreau, M. and Valletti, T (2015) "Enabling Digital Financial Inclusion through Improvements in Competition and Interoperability: What Works and What Doesn't?" CGD Policy Paper 065, Washington DC: Center for Global Development at 14, available here.

[117] Evans & Pirchio, 2015 (see footnote 1); Sitbon, E. (2015) 'Addressing competition bottlenecks in digital financial ecosystems', *Journal of Payments Strategy & Systems*, 9(3); Jack, W. and T. Suri (2011) 'The Economics of M-Pesa' MIT working paper; Jack, W. and T. Suri. (2014) 'Risk Sharing and Transactions Costs: Evidence from Kenya's Mobile Money Revolution. *American Economic Review*, 104(1): 183-223; Robb, G. and T. Vilakazi

customer's mobile money account is in the vast majority of cases associated with her or her telephone number. Thus the firm with larger market share in telecommunications and/or mobile money may be able to leverage its market power from one market into the other. This can create a mutually reinforcing dynamic, whereby the telecommunications and mobile money services of the MNO become 'must have' services. The customer that does not have them is excluded from the ability to make cheaper calls and send money directly to most other users.

Account-to-account interoperability can reduce the network effects that contribute to market power in the markets for mobile financial services. It allows a new or smaller mobile money provider to offer an attractive service to customers because their customers can send money from any mobile wallet to any other mobile wallet – including those on the incumbent provider's network – without incurring charges at a level that discourages such a transfer. Interoperability can thus share the network effects across networks, and reduce the incumbent's market power. Most importantly for the consumer, interoperability enables mobile money providers to compete 'on the merits' of the service, attracting customers and usage on the basis of the quality, price, agent availability and innovation of its services.

Interoperability may thus reduce the harmful effects of anticompetitive USSD pricing (see section 3.4) and agent exclusivity (see section 0), because money can more easily circulate in the system.

3.5.3 Forms of interoperability

There are numerous possible ways in which interoperability can work[118], with variations depending on the degree to which they:

- have ***breadth of scope***, e.g., focusing on interoperability among mobile wallets only, or instead between mobile wallets and bank accounts as well;
- are based on ***bilateral or multilateral*** arrangements, i.e., a series of one-to-one arrangements or instead a common processor that switches payments for each account provider shared by all participants; and
- involve ***third parties*** such as regulators or independent switching providers to facilitate them or instead remain proprietary to their participants.

Interoperability can be set up by central banks, by banks that own their own switches, by card payment companies and between mobile money providers. Tanzania set up interoperability on a bilateral basis but relying on common standards to which all providers could sign-up, while Pakistan followed a switch model.[119]

The most desirable option in a given circumstance will depend very much on the starting point, for example, whether there are already partnerships between MNOs and banks, and existing and planned clearing and settlement systems. Different costs, negotiation complexities and risks are involved. Whether the process is negotiated or imposed by regulators will influence the appetite for risk and complexity.

(2015) 'Barriers to entry in mobile money: a comparative study of Kenya, Zimbabwe and South Africa', project report for CCRED/National Treasury project on Barriers to Entry; Hanouch & Chen (2015), cited above.

[118] Clark, D and Gunnar C. (February 2014), *A2A Interoperability, Making Mobile Money Schemes Interoperate*, GSMA, available here.

[119] GSMA, December 2015, *Mobile Money: Choosing a technical model for A2A interoperability: Lessons from Tanzania and Pakistan*, available here.

Negotiating the details of interoperability is sufficiently demanding that it requires a major commitment of time of the participating mobile money providers and experts, and possibly third party institutions to support, encourage and even fund the effort. Building systems for the first time, such as Tanzania's operational standards, also takes considerable time and support to reach consensus. Thus even where left to voluntary negotiation, the 'transaction costs' of arranging interoperability for the first time may require significant support from independent organisations and central banks.

Some features of any interoperability mechanism are particularly important to facilitate competition among service providers and make a meaningful difference for low income users. For instance, they need to be made in real time, unlike many banking transfer systems. It is also important to ensure that the charges for cross-network transfers be kept as low as possible, and if possible at the same level as for charges for transfers made to users of the same network.

This is more complicated than it sounds. In 'sender pays' telecommunications interconnection, the network operator is paid by the sender of the call. In contrast, mobile money transfers involve both sender and receiver paying, as mobile money providers typically generate revenue both on transfers and on cash-outs. (They rarely charge for cash-in, as the commercial objective is to attract money into the system; indeed, they typically pay an agent commission for facilitating cash-in.) So, if money leaves one mobile money provider's system for another's, the latter inherits the commercial opportunity of the cash-out business.

This could be resolved through charging the customer a fee for the transfer akin to a cash-out fee, but this would effectively undermine the purpose of interoperability, which is to enable seamless transfers. As a result, commercial models include agreeing a compensation mechanism payable by the receiving to the transferring mobile money provider, treating the transferring provider like an agent receiving a commission.

Thus embarking on introducing interoperability, whether through voluntary negotiation or mandated by regulation, is a commitment to a process that may take time.

3.5.4 Voluntarily negotiated interoperability

Voluntarily negotiated account-to-account interoperability between mobile money providers with large market shares and third-party mobile wallets is unlikely to be achieved soon in many countries. Nevertheless, in some countries, mobile money providers have concluded that it is in their commercial self-interest to negotiate account-to-account interoperability. In Indonesia, Pakistan and Tanzania, the MNOs have voluntarily established account-to-account interoperability, allowing users to make transfers to subscribers of another MNO.[120] But these are the exception.

Box 8. Account-to-account interoperability in Tanzania[121]

[120] For example, in Tanzania, as of February 2016, all four MNOs providing mobile wallets have achieved voluntary, bilateral interoperability. Subscribers of each MNO can transfer mobile money to accounts of subscribers held through the other MNOs at no additional charge.

[121] Musa, O., Niehaus, C., Warioba, M., CGAP, 4 March 2015, *How Tanzania Established Mobile Money Interoperability*, available here; Hanford, R., Mobile World Live, February 2016, *Tanzania in mobile money 'first' for Africa*, available here.

In Tanzania, four MNOs have negotiated and agreed voluntary interoperability of mobile money accounts.[122] Airtel Money and Tigo Pesa implemented interoperability in August 2014, and EzyPesa and Vodacom's M-Pesa joined in early 2016. Vodacom, the largest MNO and mobile money provider in Tanzania, had held back from joining the arrangement, but as it became plain that the others were proceeding without it, it became more advantageous to it to participate than remain out in the cold.

Instead of building a common switch as a central exchange system for all participants, the mobile money providers concentrated on common operating standards for bilateral exchange, including topics such as membership and participation criteria, clearing and settlement principles, dispute resolution, principles for interchange compensation (for cross-network transfers) and interparty risk.

The parties agreed to go further, including to enable cash-in and cash-out from any MNO agent for any service. In addition, they agreed that in due course they will enable employers *making* bulk payments of salaries into multiple mobile wallet accounts, and utilities, schools and merchants *receiving* payments from multiple mobile wallet accounts, to do so using a single account regardless of the subscriber's mobile money provider.

3.5.5 Mandating interoperability

Interoperability can also be imposed by regulation, but the reality is that to make it happen, extensive effort to facilitate and encourage negotiations among participants is necessary to address the sorts of complexities described above, and it needs to be timed thoughtfully. For example, the Central Bank of Nigeria declared interoperability mandatory in 2012.[123] It may be more important initially to ensure the mobile money sector develops before imposing obligations of interoperability.

Indeed, there are arguments that introducing interoperability too early may be counterproductive. In the early stages of developing a market for mobile financial services, the opportunity to build network effects should lead to fierce competition. Competitors will seek to make an early lead.[124] Some consider that imposing interoperability while there is extensive experimentation with new business models before the market matures may reduce the incentives for innovation and investment.[125]

However, some markets have developed network effects that may have become so strong that even the most innovative, best priced and highest quality new entrant mobile money service cannot make any headway in the market in face of the dominant service. Competition 'on the

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[122] The negotiations benefited from considerable expert support facilitated by IFC and funded by the Bill & Melinda Gates Foundation and Financial Sector Deepening Tanzania (FSDT).

[123] The NCB's order is available here. The Regulatory Framework for Mobile Payments in Nigeria, available here, provides in section 4: "All schemes shall be able to interoperate: 4.1.4.1 with other scheme or solution providers; 4.1.4.2 with other payment channels like cards, ATM, POS, etc.; 4.1.4.3 with the National Central Switch. 4.1.4.4 The National Central Switch shall provide scheme codes for the various operators of mobile payments services for the purpose of seamless operations and settlements, with the ultimate aim of giving immediate value to all user transactions."

[124] See Bourreau, M. and Valletti, T (2015).

[125] Early views on whether interoperability should be required by regulation have thus tended to shy away from the idea. In 2011, for instance, the view of authors of a Bank for International Settlements working paper was 'the tentative answer should be no – at least for the time being.' Dittus, P. and Klein, M., 2011, *BIS Working Papers, No 347*, On harnessing the potential of financial inclusion.

merits' is simply not possible because the mutually-reinforcing network effects of telecommunications and mobile money services make it extremely difficult to break into the market.

There is thus a risk that without interoperability, or introducing it too late, the market leader may become entirely invulnerable to competition.[126] Where one service provider is dominant, these network effects can crowd out competition and entrench the current market structure.

The arguments against mandating interoperability weaken as the market becomes more mature, as agent networks are built out, as the lead firm earns the returns to recoup its investment, and particularly as its dominance becomes embedded. In such cases, interoperability may be essential to alleviate harmful network effects.

However, large MNOs with extensive infrastructure and upfront investment in mobile money networks have little incentive to voluntarily interoperate with smaller MNOs and other mobile financial services providers.[127] In addition, interoperability may impose additional costs on service providers to allow for compatibility between diverse technologies and systems.[128] Most of all, nobody wants to give up protections against erosion of market share to competitors.

Given the challenges of complexity and unaligned commercial interests, the regulator's ability to resolve failures to agree may be essential to success. Beyond technical interoperability, it will also be important to ensure that charges for making cross-network transfers do not discourage cross-network transfers.

Imposing interoperability may become easier as more countries adopt models that can be followed, but the technical and commercial issues do require significant facilitation and expertise. The trade-offs among the different interoperability models need to be considered in context. In countries where market power has become particularly entrenched, ensuring interoperability may be necessary to enable competitors an opportunity to compete on the merits of the prices, quality, variety and innovation of their services.

Overall, the perfect should not become the enemy of the good. A desire to set up the perfect national interoperable system should not be allowed to become so complex to negotiate or costly to impose that it significantly delays addressing important competition problems, where they exist. Interoperability likely serves a very precise policy function, which is to address growing or entrenched dominance of the lead player, so if this can be achieved, its most critical benefits will be realised.

3.6 Customer data and risk-based financial services

Data is of increasing importance to mobile financial services. It is central to improving financial inclusion for more advanced services, such as lending and insurance. Data and its management is also key to profitability, and as a result, it is valuable. Control over access to data, then, is an important commercial and regulatory policy issue.

[126] Bourreau, M. and Valletti, T (2015).

[127] Aylward, C. et al. (September 2015).

[128] Clark, D and Gunnar C. (February 2014).

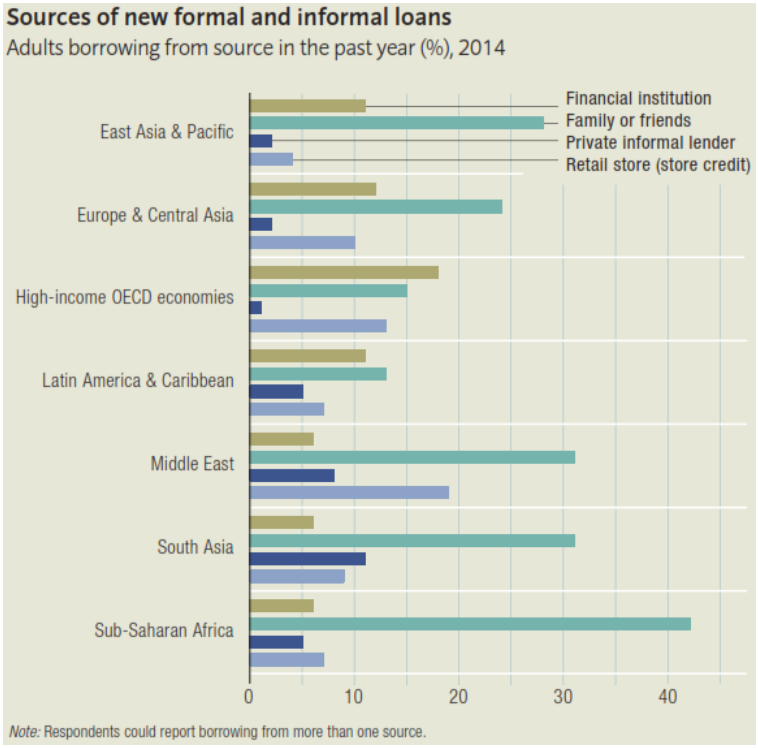
3.6.1 Borrowing practices of the unbanked

People in lower income regions borrow as often or even more than in higher income countries (section 2.1). Life is precarious and emergencies happen more often, and goods that are public and taken for granted in higher income countries (e.g., health and education) and necessary to advance are provided privately and require investment.

The difference between the wealthier countries and the poor is who they borrow from – and on what terms and conditions. People in lower income countries borrow markedly more from family and friends, and relatively little from formal financial institutions such as banks, microcredit lenders and mobile credit providers (**Figure 17**). They also borrow from informal money lenders at high rates of interest.

The lack of access to formal financial institutions for loans results from a combination of high cost to banks of building and maintaining bricks and mortar branch networks, lack of credit histories to inform lending decisions, costly due diligence compared to the small amounts involved, and time, cost and legal uncertainty of arranging collateral. Where banks do make loans available, large numbers of people do not avail themselves of such finance because of the burdensome process involved in securing approval and cost of legal fees.

Figure 17. Who do the rich and poor borrow from?



Source: Global Findex database 2014

In this context, mobile credit enters the market with an extraordinary potential to transform financial inclusion, bringing people into the formal lending market. Distribution costs are low because the customer is already identified, the telecommunications network and many agents are already in place, people have handsets, and the technology allows multiple automatized micro-loans at tiny marginal cost.

The key missing piece is the assessment of the customer's ability to repay. This is doubly difficult where the customer has not borrowed before in the formal sector. If he or she has

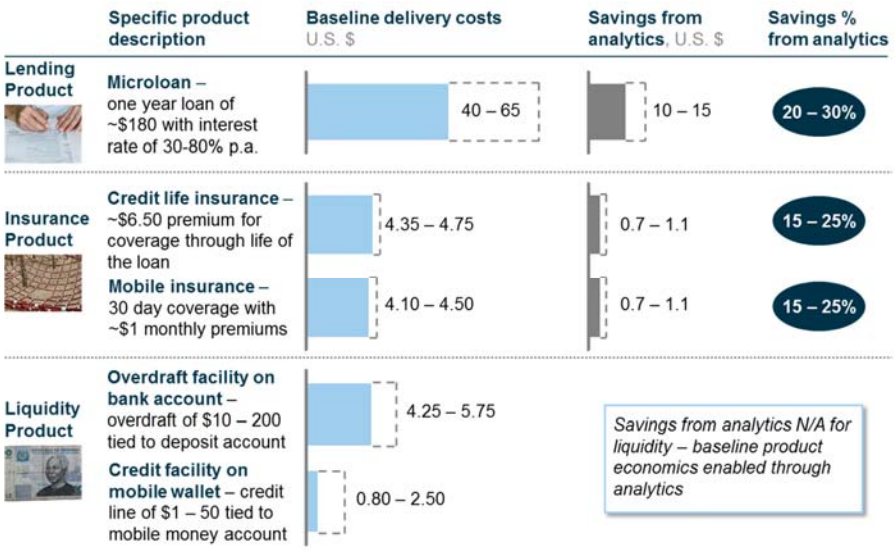
borrowed before, it may have been before credit bureaus were established in the country and started collecting data. Even if credit bureaus were already collecting data, they likely only collected 'negative' data about defaults and not 'positive' data about successful repayments.

It is in face of such poverty of data on the customer's creditworthiness that mobile money customer data enters the scene.

3.6.2 Mobile money transaction data and risk-based financial services

Digital activity leaves vast 'data exhaust' that can be immensely useful in evaluating risk and reducing cost of lending and insurance.[129] A recent study in Tanzania conducted by CGAP and McKinsey found that using non-traditional data and advanced analytics could reduce the delivery costs of basic microloans of around USD180 by 20-30%. The majority of savings would be generated from lower underwriting costs, loan application costs, collections costs and risk costs. The same study found that use of such data could reduce delivery costs for one-year credit life and mobile insurance by15-25% due to lower customer acquisition costs and more effective underwriting.[130]

Figure 18. Data driven cost-reductions in loans and insurance in Tanzania



Source: CGAP, December 2014, Projecting Impact of Non-Traditional Data and Advanced Analytics on Delivery Costs, available here.

Smartphones now have a wide range of capabilities[131] and phone use leaves a trail of data, such as phone use – quantity of use, as well as location and type (voice, SMS and data) – and locations. Airtime purchases give an indication of capacity to pay. Where users use value added services (VAS), the type and scale of these provides information about the user's

[129] Mayer-Schonberger, V. and Cukier, K., 2013, *Big Data: A Revolution That Will Transform How We Live, Work and Think.*

[130] CGAP, December 2014, Projecting Impact of Non-Traditional Data and Advanced Analytics on Delivery Costs, available here. Chen, Gregory, and Xavier Faz. 2015. "The Potential of Digital Data: How Far Can It Advance Financial Inclusion?" Focus Note 100. Washington, D.C.: CGAP, January, available here.

[131] Capabilities include: communication through voice and texting/messaging, call history records, internet access, location ID, biometrics, unique ID, touch screen, camera, graphical interface, Near Field Communications (NFC), remote monitoring and USSD menus.

choices and, where VAS are for entertainment (e.g., ring tones), they give an indication of disposable income. Where customers are accessing the internet, they leave vast information about their interests and, through social networking, their relationships. In addition, predictive tools such as psychometrics questioning on attitudes and abilities can help lenders build on credit scoring methods to produce a basic evaluation of entrepreneurial risk of business borrowers.

Data about a customer's revenues and expenditure habits – his or her cash flow – enables the lender to assess the risk of the customer defaulting on the loan, and so to manage that risk better in terms of credit approvals, loan amounts, loan durations and other conditions. Data about a customer's situation and behaviour will also enable the insurer to determine better what insurance to provide, and on what terms. Such data can be pieced together from mobile money activities. Innovative MNOs and banks can together use the customer's mobile money transaction data history and the bank's lending expertise to produce credit scores and instant lending decisions that determine loan amounts and terms.

Box 9. Data analytics for mobile financial services

Cignifi[132] has provided data analytics to MNOs in Mexico, Ghana and Uganda[133], an airtime financing company in Philippines and credit card company in Brazil. It develops and operates systems to analyse mobile phone data to assess customer risk, linking mobile phone customers and financial service providers. Cignifi's technology helps lenders to identify potential borrowers lacking credit history, setting tiered financial products according to the level of default risk. It will also assess the probability of a consumer using a specific financial product, thereby improving acceptance and activation rates and reducing customer acquisition costs. Cignifi generates revenue per credit score generated, by product developed and success fees.

Founded in Chile, Tiaxa[134] supports MNOs in providing micro credit in over 20 countries in Latin America, Asia and Africa. It carries out anonymous user behaviour analytics and credit scoring, risk management, and also runs technological and commercial processes for the disbursement and collection of loans. It "analyses macro and micro business variables, such as service usage and uptake, pricing effectiveness, user consumption and top-up behaviour and user response to certain campaigns, unique user, ARPU and user NPV, net-addition analysis, churn prediction, as well as technical and operational variables, such as platform and service uptimes, throughputs, networking and processing bottlenecks, charging efficiency, among others, allow us to suggest an effective plan to our clients, which leads to sustained economic results."[135] Tiaxa also provides MNOs with infrastructure, clearinghouse and revenue enhancement services.

[132] See http://www.cignifi.com/.

[133] Cignifi has assisted International Finance Corporation (IFC) in setting up mobile credit scoring for Airtel in Uganda. See here.

[134] See https://www.tiaxa.com/.

[135] See here.

Other firms developing ways to connect viable customers lacking sufficient credit histories or scores with access to finance by exploiting transaction behaviour and interactive communication data to assess risk include Revolution Credit[136] and Juntos Finanzas.[137]

In China, Alibaba built mobile credit products for ecommerce vendors using credit scoring based on internet usage and other data points. The automated lending system, which does not require direct contact with the lender, qualifies borrowers for unsecured loans based on revenue growth, transaction data, rating in the industry, user ratings and purchases and poor behaviour, usage levels and repeat buyers.[138]

In many countries, internet penetration and usage remains low, and people still operate predominantly on feature phones rather than smartphones. Safaricom in Kenya has launched successful mobile credit offers with two banks (M-Shwari with CBA and KCB M-Pesa with KCB) with extremely high increases in the number of account holders and rapid rise in the number of loans made (see Box 10). In Tanzania in 2014, Vodacom and CBA launched M-Pawa, a MNO savings product using a true bank deposit account and offering short-term, unsecured credit from CBA. Airtel offers mobile credit through Timiza, a partnership with Jumo, a microfinance institution. Tigo recently announced a credit product called Tigo Nivushe with Jumo.[139] MTN and Airtel in Uganda are preparing to launch similar services in Uganda.

Box 10. Mobile credit in Kenya

Safaricom and Commercial Bank of Africa (CBA) launched the mobile credit product M-Shwari in Kenya in 2012. By combining banking expertise in assessing risk based on behaviour with management of this data, Safaricom and CBA were able to create a system that produces credit scores that could be fed into CBA's information systems with pre-set lending criteria to generate instant lending decisions. As a result, a subscriber to the M-Shwari service on Safaricom's menu can apply for and obtain a loan from CBA within minutes, with the funds delivered to his or her M-Pesa mobile wallet.

As customers use this service, they build a credit history with CBA, which includes positive and negative data – which grows in its richness and usefulness to the lender with repeat loans. Subscribing to M-Shwari requires having a Safaricom subscription and includes opening a bank account with CBA, which is instantly done through cross-referencing of customer information already held by Safaricom. M-Shwari had 7.1 million active accounts in September 2015, of which 3.3 million were 30-day active.

The credit scoring algorithm and lending evaluation system appears to be highly effective. Non-performing loan rates are very small, at only about 2%, compared with over 20% in years past.

[136] See http://www.revolutioncredit.com/about-us/.

[137] See http://juntosglobal.com/ and Valenzuela, M., Holle, N., and Noor, W., CGAP, *Juntos Finanzas, A Case Study*, October 2015, available here.

[138] Shrader, L., CGAP, 11 October 2013, Microfinance, E-Commerce, Big Data and China: The Alibaba Story, available here.

[139] Gordon, C., CGAP, 2 March 2016, Tigo Nivushe, Tanzania: 5 Ways to Build Trust in Digital Lending, available here.

In 2015, Safaricom and Kenya Commercial Bank (KCB) launched a similar product, KCB M-Pesa, using similar processes. By September 2015, there were 2.7 million active KCB M-Pesa customers and 1.3 million 30-day active customers.

Co-operative Bank, with 10 million co-operative members, launched MCo-op Cash mobile money in 2014, which also allowed application for loans. By December 2014, 1.42m customers had registered for the service. After earlier launching mobile banking through M-Pesa with Safaricom and subsequent withdrawal from the relationship, Equity Bank launched in 2015 an MVNO, Equitel, and a mobile money and credit product (**Equitel My Money**) to its subscribers. Equitel runs across the Airtel network, but its core profit strategy is in banking services rather than mobile telecommunications. Existing Equity Bank customers can obtain their SIM cards from the bank's branches and activate the My Money account and link between bank account and Equitel SIM card. It reached 1.1 million subscribers by September 2015.

The credit scores generated by the algorithms using M-Pesa transaction data and the emerging credit history and used by CBA and KCB are not available to Equity Bank, Co-operative Bank or other aspiring mobile credit lenders. M-Pesa has a dominant position in mobile money services and the vast majority of customer transaction data that can be used in this manner for credit purposes.

Source: Safaricom Annual Report 2014-5

These products generate and analyse customer data, including history of mobile money deposits (usually to open a loan account a customer must have had a mobile money account for a minimum period such as 6 months), amounts deposited over time, the values and frequency of mobile money usage and airtime purchases and usage. For instance, a person who tops-up his or her air time regularly with a similar large amount every week is likely to be more reliable than someone who buys small amounts erratically. Thus such behaviour offers a proxy for financial stability. None of such data depends on smartphones or internet use – it can all be generated from feature phone use over the GSM network.

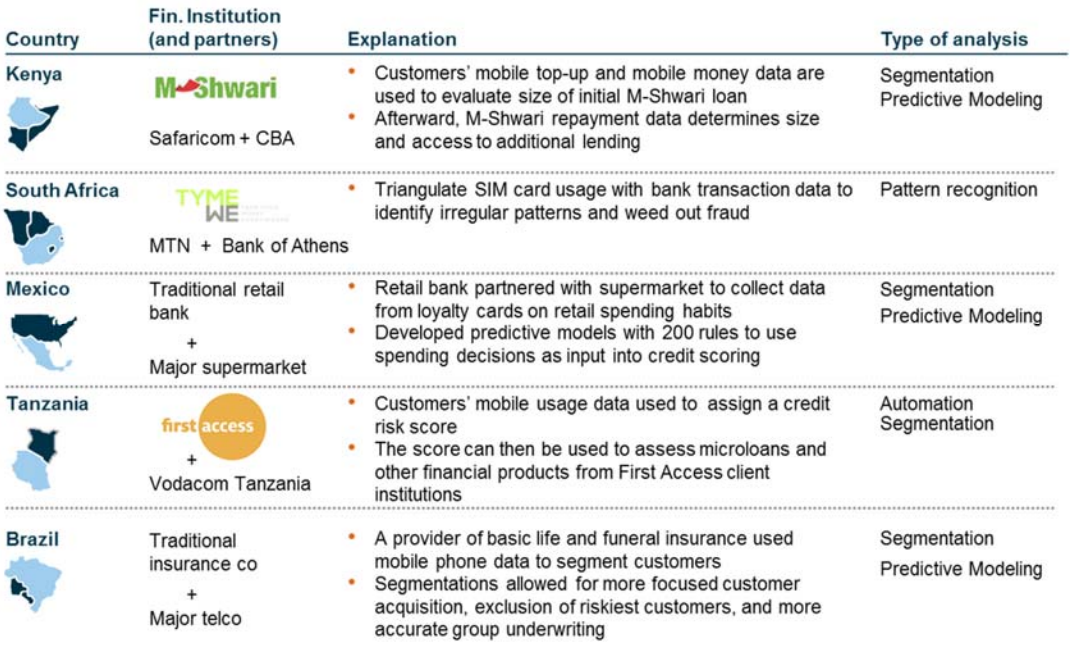
Data analytics depends on sophisticated expertise. Partnerships are increasingly common between MNOs, financial institutions and data analytics firms (see Box 9). The story of how digital data can be used for mobile financial services and to drive financial inclusion is only now beginning. It is likely to extend into finding new customers, deepening knowledge of the customer's needs and capabilities, and managing risks. The regulatory policy issues are also still in their infancy, with competition, consumer protection and security risks from data protection developing every day (see section 3.7.2).

For instance, correlations are being identified by firms such as Real Impact Analytics between a person's social network established from call detail records (CDR) in Africa and his or her mobile money uptake. This enables providers to target customers for suitable financial services earlier and more cheaply, and to retain them and provide more useful and valuable services to them as the relationship proceeds.[140] These sorts of innovations reduce the gaps in accessibility, affordability and desirability (see section 1) that have historically prevented low income people from accessing financial services.

[140] CGAP, 12 March 2013, *The Power of Social Networks to Drive Mobile Money Adoption*, available here.

Multiple types of partnerships between data analytics firms, financial service providers, MNOs, social networking and other internet companies can be expected to develop if allowed and motivated to do so.

Figure 19. Financial services applications of non-traditional data and advanced analytics in developing countries



Source: CGAP, December 2014, Projecting Impact of Non-Traditional Data and Advanced Analytics on Delivery Costs, available here.

3.6.3 Competition and regulatory issues

Accompanying the tremendous boost to financial inclusion that is offered by such services are emerging competition concerns.

Where customer data is built up through internet use, a variety of internet firms may have access to data collected. In the case of feature phone use over GSM networks, the mobile money provider has exclusive control over the transaction history over its mobile money service. The borrower's mobile money account is associated with his or her phone number. Neither the credit scores nor the positive credit history that develops are available to credit reference bureaus and so other potential lenders lack such data to inform their lending decisions.

If the MNO's mobile money service is dominant, lenders may face information asymmetries that reduce the quality of their credit evaluations and lending decisions. This may present barriers to entry, growth and innovation in mobile financial services, reducing competition and increasing costs of lending, and so borrowers' costs of borrowing. The relationship between credit eligibility and phone number may become another factor that raises switching costs not only in mobile credit but also in mobile telecommunications services.

The competitive advantage achieved through such innovation can be considerable. Where banks already have credit data on their customers, they can leverage such data for mobile lending to the same customers. However, lack of access to the extensive, current data and

credit scores generated by the dominant mobile money transaction data may raise barriers to entry for alternative lenders, and switching costs for customers. This may result in limited competition, and could account for the high interest rates that these types of services, which are growing quickly, can offer. For example, KCB M-Pesa offers loans at 4% per month, which is far higher than rates that can be obtained from the banks.

As the market develops, financial regulators will doubtlessly take an interest in the availability of data for lending decision-making, whether through credit bureau reporting or otherwise. One question will be whether the lenders should report not only negative credit histories but also positive credit histories to credit reference bureaus and whether this should be made available regularly enough to be 'real time.' Regulators may also take an interest in whether credit scores generated by algorithms using data held by MNOs that have dominance in the market (i.e., where they are the only ones that can generate such data) should somehow be made available to other banks.

Greater access to such data will allow a larger number of lenders to make better informed lending decisions, which should reduce the cost of credit and accelerate financial inclusion. Such competition should also enable the reduction in cost of credit to be passed through to consumers, resulting in lower interest rates on loans.

Again, of course, the regulator faces the dilemma of when, if at all, to intervene in the market. The kind of innovations being witnessed take not only investment, but more importantly sheer initiative, cleverness and drive, as well as capacity within the players involved. These features need to be encouraged, and the most obvious way is to allow them to reap rewards from their innovations.

At some stage, regulators are likely to consider requiring open access to data where it is an 'essential facility' for mobile credit when the provider is dominant. They may regard the data on a customer's transaction history as not merely something that the mobile money provider is entitled to use exclusively but actually something in which the customer himself or herself has an interest. In time, this may result in customers having a right to use such data not merely for services provided by a select number of partner banks, but with a broader range of potential lenders. Standards for how customers' transactional data is secured, accessed, analysed and shared (and who owns it) may be required to spur on development of mobile financial services.

3.7 Consumer protection

3.7.1 Transparency, disclosure and effective consent

The upsurge in mobile financial services raises a host of consumer protection issues. The services are new mass market products that are widely used and known. They are among the most exciting services to appear on the scene, and so have a high visibility.

Although there is demand for them, customers may lack knowledge of available alternatives and the general and financial literacy necessary to make well informed decisions. When customers face significant impediments or costs in their search for alternatives, or where there are only a small number of providers of the more convenient services (such as mobile credit), providers may be able to set prices and quality of service without regard to competition or consumer pressure.

Consumer protection and competition issues are closely interrelated. For example, transparent and simple pricing makes it easier to compare services. This creates competitive pressure for providers to improve price, quality, variety and innovation. And where there is competition, consumers may

also have difficulty accessing and assessing information to compare the offers available in the market from different providers. For instance, many customers are confused about charges for transfers to other mobile wallets and payments to utilities, schools and merchants.[141]

Some of the weak protections for consumers have significant consequences. For example, some mobile money providers do not clearly disclose the amount of the fee associated with a transfer, the interest rate applicable to a loan, or the USSD charge the customer may be paying for the transaction. Sometimes they disclose via a 'url' link to a website, ignoring the fact that many users have only GSM access on a feature phone. Some providers only disclose prices after the customer has contracted for the service, including fees and interest rates for loans.

Advertising billboards sometimes do not even state the interest rate period but merely quote an interest rate or only give the minimum in a range (e.g., "4% interest" when the rates range from 4% to 6%). Customers then assume the rate quoted applies, and have no awareness of whether they are being charged based on a month's or a year's value of money. Proper disclosure should show the total effective cost of credit, including an annual percentage rate and one-off and recurring fees, as illustrated in **Table 1**.

As a result, some countries have developed rules as to what must be disclosed and when it must be disclosed to potential customers. For instance, Tanzania's Electronic Money Regulations 2015[142] require disclosure of fees and charges before imposing them.

In addition to the price of the financial services (e.g., fee for an inquiry, a transfer or transacting a loan), in many markets, there is a lack of transparency when it comes to the charges for the underlying telecommunications service (principally USSD) that customers use for those mobile financial services. When accessing a provider that is not the MNO, the customer may not even know whether the MNO is charging him or her – or the provider – for the session. Some MNOs inform the customer of the charge after the transaction, and others do not inform the customer at all.

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[141] Mazer, Rafe and Rowan, P. (2015), 'Competition in Mobile Financial Services, Lessons from Kenya and Tanzania,' CGAP.

[142] The Electronic Money Regulations 2015 provide: (1) An electronic money issuer shall display and disclose charges and fees for its services to its customers and any changes thereof. (2) An electronic money issuer shall notify its customers the fees and charges before imposing such fees or charges. (3) The notice to customer shall (a) be delivered through electronic media and displays in a conspicuous place at the electronic money issuer's offices and agents outlets; and (b) not be misleading to customers;" Bank of Tanzania Electronic Money Regulations (2015), Part XI.

Table 1. Basic consumer disclosures in mobile financial services

Poor disclosure	Better disclosure
"Your loan request of **** has been approved and funds credited to your account."	"You will receive ****. The annual interest rate is **% in addition to a fee of ****. You will make 3 weekly payments of: **** and repay a total amount of ****. Your first payment is due 7 days after you receive your loan. Early payments are welcome. Your next payment of **** is due on 8 July 2016. Please confirm you agree to these terms by pressing 1."

3.7.2 Privacy, data protection and security

The lack of access to formal financial services in developing countries makes consumers more likely to grant consent to access to and use of their data, and less aware of the risks. Consumers also often do not have the support of well-tuned legislation, much less enforcement by courts or other agents. Breaches of privacy and particularly data security may result in identity theft, harm to credit records, fraud and other risks. Poor people thus tend to be more vulnerable than those in well developed markets.

A range of privacy and data protection issues will need to be addressed in most mobile financial services markets. These include requirements to obtain effective consent, including through 'opt-in' permissions for use of customer data. Such rules on data sharing and use of data by the provider for recurring purposes would place greater responsibility in the hands of consumers for how their data is used. Rules on liability for third parties' use of customer data need to be developed. Privacy and marketing rules may be needed as well.

Privacy and data protection laws will generally need an overhaul in many countries that have as yet only rudimentary legislation. They may rely extensively on recent data protection adopted in the European Union.

Box 11. Data protection in the EU

The recently revised European General Data Protection Regulation[143] applies to the processing of personal data of data subjects in the EU, regardless of the location of the data controller and/or of the data processor. It clarifies the concept of personal data. Importantly, it strengthens the obligations imposed to organisations, such as the appointment of 'data protection officers', performance of 'privacy impact assessments', adoption of security and data protection policies and procedures, as well as the obligation to notify data breaches to the competent authorities and, in certain cases, to the data subjects. Further, it defines more demanding requirements regarding the information to be provided to the data subject as well as the data subject's consent. Controversially, it includes the right to be forgotten. It also

[143] REGULATION (EU) 2016/…OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation), available here.

establishes rules on profiling, and authorises very substantial fines for non-compliance, which may be of up to 20 million Euros or up to 4% of the worldwide annual turnover.

However, lack of understanding of the data ecosystem and associated risks, as well as the appetite to access the service, likely reduce the protection afforded by effective consent systems. Regulators will likely need to ensure some basic protective measures, and increasingly focus on requiring at least the larger providers to adopt the 'Privacy by Design' principle. The development of industry standards, in dialogue with the regulators, for this purpose, will be important to ensure actual adoption.

Increasingly, the possibility for customers to 'port' their data to different firms, e.g., to support a loan application or open an account, may be considered (see section 3.6). This would empower consumers, but must be balanced against the importance of encouraging development of proprietary data analytics and innovative services.

Lastly, security issues are crucial both for consumer confidence that will drive adoption rates up, as well as for protection. Issues relate to access control, authentication, non-repudiation (i.e., preventing customers denying transactions they have carried out), data confidentiality communication security, data integrity, availability and privacy.

The ITU[144] has adopted recommendations regarding security of mobile financial services. These set out approaches to system security for mobile commerce and mobile banking provided over next-generation networks (NGNs)[145] and general architecture of a security solution for mobile commerce and mobile banking in the context of NGN, including identifying relevant participants and their roles, as well as operational scenarios and implementation models.[146] It has also developed toolkits on security that are applicable to mobile money.[147]

3.7.3 Disputes and complaints processes

Processes for redressing customer complaints about the collection and use of incorrect data, or data incorrectly collected, will be needed. Disclosure about what data about a customer is collected, how it will be treated and used, including for third parties, will also need to be developed.

The need for such processes is not merely for data matters, however. Dispute and complaints procedures are important to protect consumers and ensure trust in the mobile money system.[148] Mobile money providers often provide free customer service hotlines and communication channels. Digicel reportedly doubled its call centre staff in Haiti on paydays for the Ti Maman Cheri Program.[149] It can also generate feedback from customers, as seen in

[144] ITU-T Study Group 13 on Future Networks.

[145] Recommendation ITU-T Y.2740.

[146] Recommendation ITU-T Y.2741.

[147] ITU-D Study Group 2, Question 17-3/2 on progress on e-government activities and identification of areas of application of egovernment for the benefit of developing countries.

[148] CGAP, March 2016, Zimmerman, J. and Baur, S., *Understanding How Consumer Risks in Digital Social Payments Can Erode Their Financial Inclusion Potential*, available here.

[149] Zimmerman, Jamie M., and Kristy Bohling. 2015. "Partnering with Existing National Safety Nets for Emergency Payments: WFP's Collaboration with the Pantawid Pamilyang Pilipino Program in the Typhoon Haiyan Response." Somerville, Mass.: Bankable Frontier Associates, April.

Ghana's LEAP Program.[150] In Colombia, Banco Davivienda trains and employs former recipients of government-to-person payments to support the hotline and to encourage reporting of complaints and improve resolution.[151]

4 Collaboration among financial, telecommunications and competition authorities

4.1 The complementary roles of authorities

It will be plain from this paper that mobile financial services involve a range of technical and market, and thus regulatory, issues relating to the fields of telecommunications, financial and competition. This is not surprising, as the subject concerns financial services provided by competing financial services providers over telecommunications networks operated by competing MNOs, and where the MNOs are sometimes also the financial services providers.

As a result, sometimes these fields are tightly interlinked, as is the case where network effects in telecommunications markets and in financial markets reinforce one another and prevent competition. Many of the issues discussed in this paper have such linkages:

4.1.1 Agent networks

It is initially for the financial regulator to determine the permitted or required agency relationships between mobile financial service providers and their agents, but the fact that many agents double up as agents for both telephone services and financial services means that the telecommunications side cannot be ignored.

Competition authorities and financial regulators need to encourage investment in agent networks to increase density of penetration and drive coverage to rural areas. As the market develops, it may become important to examine arrangements between mobile money providers and their agents to ensure that exclusive dealing does not impede competitors from entering and growing in the market. Alternative independent agent network models also merit exploration.

4.1.2 Telecommunications platform

Regulating the underlying telecommunications service is primarily a telecommunications regulatory matter. A key area for focus in some markets will be the terms and pricing of access of competing mobile money providers to the MNOs' USSD channels. There is significant evidence of discriminatory and excessive pricing, margin squeezes and refusal of service that appears to have the effect and possibly intent of restricting competition.

Yet understanding whether the charges for USSD are part of a margin squeeze requires both an understanding of the charges for the financial services and competition analysis, and so likely involves both the financial and competition authorities. Indeed, in countries where there is a strong mobile money market, the telecommunications regulator probably cannot properly understand the market power dynamics in the mobile telecommunications market without

[150] Abbey, C. O., E. Odonkor, and D. Boateng. 2014. "A Beneficiary Assessment of Ghana's Cash Transfer Programme (LEAP) in May 2014." Accra: African Development Program Ghana.

[151] CGAP. 2014. "Going Mobile with Conditional Cash Transfers. Insights and Lessons from the Payment of Familias en Accion through DaviPlata Wallets in Colombia." Working Paper. Washington, D.C.: CGAP.

examining the mobile money market. Failure to do so risks mistaken findings and regulatory decisions in telecommunications.[152]

4.1.3 Account-to-account interoperability

Financial regulators will typically benefit greatly from coordinating discussions on interoperability with both telecommunications regulators and competition authorities. Both have an understanding of competitive markets in a network industry, network effects and the need for interoperability. The telecommunications regulator will also typically have extensive experience with the practicalities of telecommunications network interconnection, including flow-through problems of wholesale pricing for cross-network transfers. While telecommunications interconnection and mobile money interoperability are not the same thing, there are lessons worth sharing among regulators.

4.1.4 Consumer protection

Consumer protection in mobile financial services primarily arises as a financial regulatory matter. However, it also involves various issues relating to the underlying telecommunications service, including how fees are charged to consumers. Transparency about charges and the features of services is not only important to protect consumers, but is also crucial to effective competition because of its importance in enabling customers to compare offers. Many competition authorities also have responsibilities for consumer protection.

Similarly, questions of data protection and security require the engagement of both financial and telecommunications regulators. The financial systems operate over telecommunications networks, making data protection and security a combined concern of both sectors' regulators.

4.2 Collaborating in the use of powers

In addition to the substantive themes described in section 4.1, the structure of legal powers and regulatory regimes makes cooperation among authorities important.

Sector specific regulators, such as telecommunications and financial authorities, typically have a combination of *ex ante* powers (authorising them to introduce forward looking regulations) and *ex post* powers (authorising them to enforce against violations of the law and regulations). Competition authorities tend to have *ex post* powers, principally to investigate and enforce against anticompetitive behaviour. However, these sometimes overlap, particularly in respect of competition and consumer protection issues, where both the sector regulator and competition authority may have functions and powers.

Some competition authorities have stronger investigatory and information gathering powers (powers of production, evidence gathering and search and seizure powers) than telecommunications regulators. Some telecommunications regulators can impose larger fines than competition authorities, which are often still in their early years of operation and have not yet been trusted with power to impose high penalties. Or the opposite may be the case. Some agencies may have power to impose interim remedies to stop and desist certain anticompetitive action.

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[152] The Ugandan Communications Commission (UCC) recently carried out a market review and found cross-side network effects between telecommunications and mobile money markets. The UCC did not look in detail at mobile financial services, but it did consider them. The UCC's market review reports are available here.

In light of all of the above, collaboration is beneficial:

- for efficiency purposes, as where powers overlap, collaboration may reduce duplication in resources;
- to reduce duplication and conflict between agencies' investigatory actions and remedies, for example in respect of anticompetitive behaviour; and
- to allow agencies to draw on each other's respective strengths, including ensuring that the agency with the stronger legal powers, larger budget or political credibility uses those optimally.

In some countries, the agencies are expressly required by law to consult with one another and coordinate intervention, and in other countries, they have taken it upon themselves to establish protocols for doing so.[153] They might agree to consult and coordinate in defining relevant markets, determining dominance, mergers and investigations. In some cases, they will agree that one agency will take a lead in *ex ante* (e.g., the sector regulator) and the other in *ex post* (e.g., the competition authority) matters.[154]

Good coordination among agencies can greatly enhance the effectiveness of interventions, particularly in the area of *ex post* investigations and enforcement where often both the sector regulator and the competition authority have a role.

Between telecommunications and financial regulators and competition authorities, many countries have sufficient legal powers that, if coordinated, can address the regulatory and competition concerns that are arising in mobile financial services. They only require the political will of these institutions to collaborate towards a common goal.

4.3 Making unilateral progress where necessary

The importance of collaboration among authorities begs the question what is to be done where there is rivalry between agencies (e.g., if their powers overlap) or where they are not particularly interested (e.g., central banks famously treat competition as a lower priority than financial stability and prudential regulation). Different agencies are often territorial, competing directly or indirectly for public funds and favour from political leaders, eager to be seen to lead, and sometimes subject to influence (regulatory capture) by the entities they regulate.

In this context, what is less widely discussed in the case of mobile money is that even where collaboration among authorities is weak, there is nevertheless scope for individual agencies to act, and in particular when one does not, others may yet be able to make a useful regulatory intervention.

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[153] In Tanzania, the Fair Competition Commission has concurrent jurisdiction with the telecommunications regulator but not the financial regulator, the Bank of Tanzania. On matters of market conduct, the FCC coordinates with both authorities. In Kenya, the Competition Authority of Kenya has entered into Memoranda of Understanding with each of the Communications Authority of Kenya and the Central Bank of Kenya to cooperate in areas where they have related functions and powers. The Kenyan Parliament enacted amendments to the Communications Act early in 2016 that require the Communications Authority to consult with the Competition Authority when assessing market dominance.

[154] For a discussion of the relationship between sector regulation and competition regulation, see Dunne, N., *Competition Law and Economic Regulation: Making and Managing Markets*, 2015.

Where collaboration is delaying intervention, it may sometimes be better for regulators to proceed to use the powers they have as best they can, and not allow inter-agency bureaucracy and politics to cause undue delay. For example:

- The financial regulator may address ***agent network exclusivity*** in its regulations. But if necessary, competition authorities typically have the power alone to determine whether agent exclusivity is anticompetitive restraint on trade and so unlawful.
- Problems with access to or pricing of the ***telecommunications platform*** (typically USSD) is a plain telecommunications regulatory matter. In most countries the telecommunications regulator has ample powers to study the market and intervene to ensure that if the MNO is dominant, it provides its services in a non-discriminatory manner at a reasonable price and quality. In the absence of action by the telecommunications regulator, the competition authority (if there is one) might investigate whether the practice in question is an abuse of dominance violating the country's competition law.
- On the other hand, ***account-to-account interoperability*** likely needs the proactive intervention of the financial regulator, which may require building a broad consensus given the lack of priority financial regulators give to competition.

5 Conclusion

Financial, telecommunications and competition authorities all need to make thorough reviews of the markets involved in mobile financial services. The nature of the different products and their market dynamics must be understood, in particular where capital is put at risk. The strategic importance to the economy and lives of the population must be recognised. Risks to the stability of financial system must also be mitigated, identifying those risks accurately with the relevant activities within the business. For example, as discussed in section 3.3.1, there may be significant scope for liberalising the agent market for cash-in and cash-out transactions without creating systemic risk.

Financial, telecommunications and competition authorities thus need to understand the elements of the value chain, how these are currently structured and where they might be unbundled whether by commercial drivers or regulation.

Understanding the different markets in mobile financial services is crucial to addressing market power and enabling competition to drive innovation. Defining such markets is not always obvious. For instance, in some cases, mobile money agents might be seen as part of a wider market alongside ATM distributors and banks. Mobile credit might be part of a wider lending market. Mobile payments might be part of a larger more competitive payments market including banks, credit and debit cards, public transport system cards and POS device payment services. It will be important not to leap to conclusions but to distinguish products and services according to whether the consumer would regard them as substitutable for one another.

Market power needs to be assessed, not merely in terms of market share, which can in some cases be a shallow and sometimes inadequate or even misleading basis for assessment. Market shares for mobile telecommunications services provided by MNOs are typically quoted in terms of the number of subscribers, which is the easiest statistic to obtain. However, where end-users hold multiple SIMs, the number of subscribers is not as useful as a provider's share of usage and revenues. For instance, some MNOs have a significantly higher share of traffic and

revenues than subscribers, which may offer a more genuine representation of their market power.[155]

Market power does not merely depend on market share, however. Regulatory, financial and technological barriers to entry and growth, innovation that may result in new products that supersede those in the market, and other factors may influence market power. Of particular importance is understanding the interaction of market power in mobile telecommunications services and market power in mobile money services, and the potentially mutually reinforcing (cross-side) network effects in each for MNOs' proprietary mobile money services.

Where there are problems in market power, it will be important to inquire into and investigate abuses of dominance and other anticompetitive practices. A distinction must be made between allowing investment to reap its rewards and actively restraining competition on the merits.

The availability of customer data is likely to be important as services that depend on knowing the customer develop. Risk-based financial services, in particular lending and insurance, will depend on profiling customers, and control over the data that is an input to credit scorecards and similar evaluations will be crucial. Some will argue that the data should belong to the customer, or that it is a public good that ought to be more widely available for competing providers, yet the data is also only available as a result of entrepreneurial investment by those who saw the opportunity to meet demand for financial services. Resolving these issues may determine the shape of the market in more sophisticated services that will develop.

Consumer protection is not a secondary priority, as it has been in much traditional telecommunications regulation where liberalisation and competition were primarily expected to deliver the desired consumer benefits. Consumer protection issues are now front and centre, crucial for the ownership and use of data about them, as well as for the transparency of prices and terms and conditions that are so important for competition to function.

Working through these various issues requires the combined knowledge, resources and powers of financial, telecommunications and competition authorities and regulatory policy makers. Reaching across the traditional silos of regulatory institutions and their laws is essential. This year's ITU Global Dialogue on Digital Financial Inclusion offers such an opportunity, bringing together telecommunications and financial regulators to discuss digital financial inclusion with the support of the Bill & Melinda Gates Foundation. Such cross-sector meetings and studies will support regulators in assessing when they should and should not intervene, and how best they can facilitate the growth of mobile financial services in order to drive financial inclusion.

[155] When it comes to mobile money, the number of subscribers may be significantly less important than amounts actually transferred or numbers of transactions carried out, or amounts on deposit. In Kenya in 2014, for example, Safaricom had 70% of the mobile telephone subscriptions, over 80% of the mobile money subscriptions, but over 99% of the deposits into mobile money accounts and over 99% of active mobile money account users, measured by Intermedia's Financial Inclusion Insights Kenya. Intermedia. (2015). 'Kenya. Digital Pathways to Financial Inclusion 2014 Survey Report'. *Financial Inclusion Insights*: *Applied research for digital financial inclusion.* Available here. 'Active' means accounts used within the previous 90 days.

Annex 1. Regulatory checklist for mobile financial services

Regulatory issues	Telecommunications regulator	Competition authority	Financial regulator
Prudential regulation		• How can regulatory barriers to entry for MNOs, banks and other providers be reduced?	• Is there an appropriate balance between prudential regulation for level of risk of permitted activity? • What arrangements are required to ensure safekeeping of customer funds without becoming a barrier to entry for non-banks? • Is there any reason to prevent mobile money providers from distributing interest on customer funds back to customers? • Is the service extending into intermediation with significant systemic risk that merits more extensive prudential regulation?
Agent network issues	• Are there any unnecessary restrictions on using agents for airtime top-ups and mobile money?	• What is the current agent exclusivity practice, and how is it affecting investment, competition and growth in the market? • Should agent exclusivity be allowed if necessary to incentivise a first mover? • Will agent exclusivity reduce the commercial viability of rolling out agent networks for rival mobile money providers?	• Are there any restrictions on agents exchanging cash for mobile money on the mobile wallet (i.e., cash-in and cash-out) that can be lifted? • In undeveloped mobile money markets, how can regulatory conditions be improved to strengthen the first mover's incentive to invest in rolling out an extensive agent network?
Telecommunications network access issues	• What market power does the MNO have to control the pricing and quality of network services to mobile money providers? • What incentives does the MNO have, if any, to exclude from the market mobile money providers who require its network services for their business?		• Do financial institutions have the access they need to the telecommunications services to offer their services? • How is financial inclusion being affected

Regulatory issues	Telecommunications regulator	Competition authority	Financial regulator
	• Are USSD or (other telecom services that are used to deliver mobile digital financial services) offered on non-discriminatory terms and reasonable prices? • Is the price of USSD (or other relevant service) imposing a margin squeeze on mobile digital financial service providers? • Is the price non-discriminatory, and does it harm competition in mobile digital financial services? • Is the quality of the service acceptable?		by availability, quality and price of mobile telecommunications network services?
Network effects and account-to-account interoperability		• To what extent is a lack of interoperability hindering competition in mobile money through 'lock-in' resulting from network effects of a leading player? • What incentives do providers have to negotiate interoperability given their respective shares in the market? • To what extent have mobile wallets become interoperable with bank accounts and why? • What model of interoperability appears sufficient and simple to introduce in the circumstances? • What steps can be taken to facilitate interoperability negotiations among mobile money providers? • What sort of process would need to be mandated to reach viable interoperability that includes the largest provider?	
	• Are network effects in mobile telecoms services adversely affecting competition in that market? • What mechanisms are aggravating network effects, e.g., retail price differential between on-net and off-net calls? • How can such practices be controlled, e.g., pricing termination rates at cost, imposing price floors for on-net calls, limiting the differential between on-net and off-net calls? • How are network effects from lack of interoperability in mobile money feeding back in to affect competition and market power in the mobile telecom market?		
Customer data and risk-based financial services	• How do the MNO's data protection and privacy obligations regarding customer communications and network activities relate to the mobile financial services activities of the MNO?	• What privacy protections should apply to customer transaction history? • Who controls customer mobile money transaction history and positive and negative credit history? • How are these being used to enable mobile financial services? • What is the effect of this on first mover providers and competition in mobile financial services? • What information sharing arrangements and mechanisms should apply to positive and negative credit history?	
Consumer protection	• How adequate are disclosures to customers about the charges that apply to their use	• How do disclosures to customers about	• How adequate are disclosures to customers about the charges that

Regulatory issues	Telecommunications regulator	Competition authority	Financial regulator
	of the telecommunications network for accessing mobile financial services? • How adequate is the soliciting of customer consent to use of his/her data? • Where customers are unlikely to provide informed consent anyway, what protections are essential to set in place for the consumer?	charges affect their ability to compare the prices of the various services?	apply to mobile financial services? • What could be done to make these more transparent and simple? • How adequate is the soliciting of customer consent to use of his/her data? • Where customers are unlikely to provide informed consent anyway, what protections are essential to set in place for the consumer?
Competition generally	• How is competition in mobile telecom services affecting competition in mobile money? • How is competition in mobile money affecting competition in mobile telecom services? • How best can the financial, telecommunications and competition authorities collaborate to address such interrelated competition problems?		