

A Digital Pathway to Financial Inclusion

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Abstract

Payments are the connective tissue of an economic system. They enable people to buy goods, purchase water and electricity, and send money to friends, family, and business partners. They enable governments to collect taxes and disburse social payments. And they enable suppliers to collect payments from buyers. When these transactions are costly and inconvenient, economic activity is impeded.

Wealthy households live their financial lives embedded in a digital financial system which “greases the wheels” of their economic activity by making it cheap and easy for them to send and receive payments. Their money sits in a virtual account as ones and zeroes on a server, where it can be transferred with the click of a button. In contrast, 2.5 billion people – most of them poor – are cut off from that system. They store and transfer value through *physical* assets, such as cash, jewelry, or livestock. This cash-digital divide creates two mutually-reinforcing inequities in the financial lives of poor households. First, it makes it costlier and riskier for poor households to perform basic financial activities – from sending wages to one’s wife and children to financing an investment in fertilizer. Second, it perpetuates the poor’s marginalization from the formal economy by making it prohibitively costly for utility companies, banks, insurance companies, and other institutions to transact with them.

We depict what digital financial inclusion would look like and present a growing body of evidence which suggests that connecting poor people to a digital financial system will generate sizable welfare benefits. We argue that countries will not bridge the cash-digital divide in one giant leap. Instead, they will likely pass through four stages of market development along the pathway to an inclusive digital economy. The commercial assets required to navigate this pathway vary across the four stages. Financial regulations and business models must therefore be calibrated to harness those assets at each stage.

The cash-digital divide

Payments are the connective tissue of a financial system. They link buyers with suppliers, allow governments to transact with their citizens, and connect friends and relatives in webs of financial support networks. Similarly, payments are the building blocks of financial services. Savings is little more than a sequence of deposit payments from the customer to the bank and withdrawal payments from the bank to the customer. Credit involves loan disbursements to the customer followed by repayments to the bank. If it is too costly for banks and insurance companies to make (or accept) these payments, they won’t offer the underlying financial service.²

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² While transaction costs are the primary barrier preventing poor people from accessing formal financial services, they are not the only barrier. Indeed, poor people are excluded from the financial system due to (among other factors) products that aren’t attuned to their needs, discrimination by bank staff who do not want poor people in their banking halls, and minimum balance requirements and service fees that exclude poor customers.

You and I live our financial lives embedded in a digital financial system which makes it cheap and easy for us to conduct these transactions. Our money sits in a virtual account as ones and zeroes on a server, where it can be transferred with the click of a button. In contrast, most poor households live in a physical cash economy, where they store and transfer value through tangible assets, such as cash, jewelry, or livestock. A recent World Bank-Gallup survey in 148 countries found that only 24% of adults in Sub-Saharan Africa and 33% of adults in South Asia have an account at a formal financial institution.³ This compares to 89% of adults in high-income economies.

This gaping “cash-digital divide” creates two mutually-reinforcing inequities in the financial lives of poor households. First, it makes it expensive and risky for them to perform basic financial activities that you and I take for granted. Second, it drives a wedge between poor households and the formal economy by making it costly for banks, insurance companies, utility companies, and other institutions to transact with them. We address both of these inequities below:

The poor’s immersion in physical cash creates considerable frictions in their financial lives

Cash has advantages. It is liquid and you don’t have to pay any fees when you want to transact with it. However, the dominance of physical cash in the lives of poor households also imposes several costs:

Storage risk- Cash-based households have multiple savings options. They can store money under the mattress, accumulate jewelry or livestock, or entrust their money with informal providers, such as money guards or informal savings groups. Unfortunately, these informal storage mechanisms are exposed to considerable risk: cash and jewelry can be stolen, livestock can fall ill, and informal savings groups are exposed to the risk that someone will run off with the cash. A study in Uganda found that among the 1,232 interviewees who saved in cash, 75% had lost some of their savings in the previous year.⁴

Transport costs- Cash adds cost to any remote transaction. To move value over distance, cash-based customers must use informal mechanisms, such as bus networks and couriers, which tend to be slow, expensive, and risky. A survey of 274 domestic Indian migrants and their families back home found that 57% of migrants use informal “hawala” couriers to transfer money and the average cost of making a typical remittance through a hawala was 4.6% of the transfer amount.⁵

Psychological barriers to saving- Our money is “born” digital through direct deposits of wages, pensions, or other payments. This helps us overcome temptations to spend cash in hand because funds bypass our home and go directly into our account. Numerous studies of savings behavior in developed countries find that pension savings rates are considerably higher when savings is the default option via automatic enrollment in a pension plan.⁶ In contrast, the poor’s money is born physical, which means they have to take *active* steps every time they want to save by stashing cash under their mattress, giving it to a money guard, or contributing to a savings group. This forces poor households to surmount self-control challenges over and over again amidst pressing consumption demands (for food, housing) and requests from friends and neighbors who are also poor. The problem is that self-control is a scarce resource: it gets depleted the

³ Demircuc-Kunt and Klapper (2012), “Measuring Financial Inclusion: The Global Financial Inclusion Indicators,” *World Bank Policy Research Working Paper #6025*.

⁴ Wright and Mutesasira (2001), “The Relative Risks of Informal Savings,” *MicroSave Research Paper*.

⁵ Gopinath et al (2010), “Putting Money in Motion: How Much Do Migrants Pay for Domestic Transfers?” IFMR and Reserve Bank of India College for Agricultural Banking Working Paper.

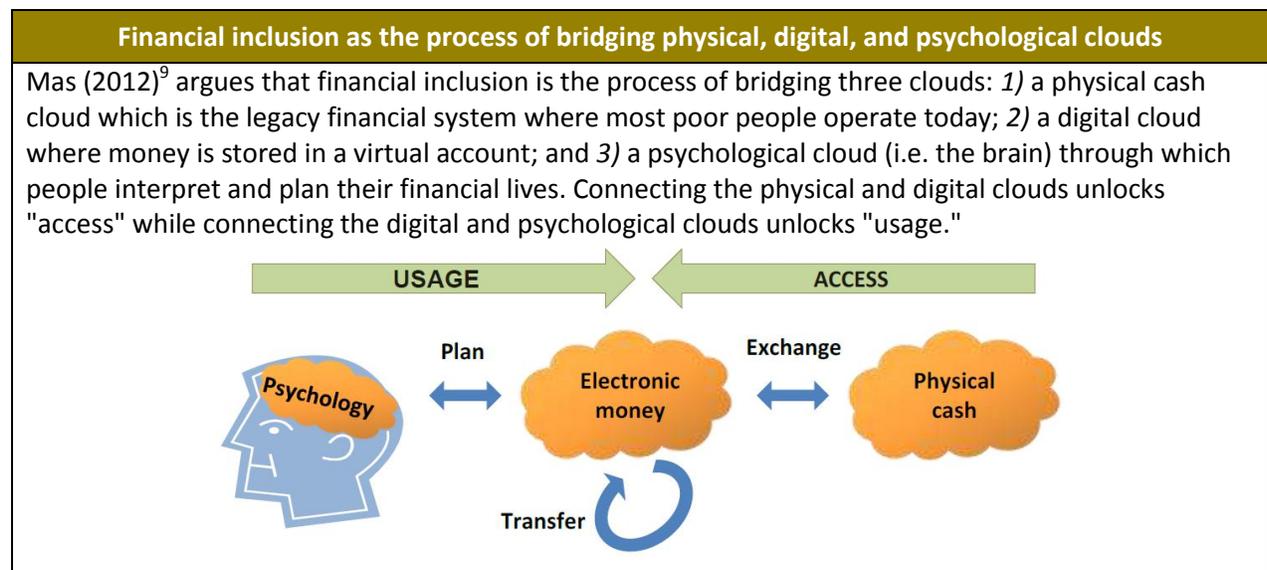
⁶ Madrian and Shea (2002), for example, find that setting automatic enrollment as the default participation in 401(k) plans leads to a 50 percentage point increase in participation rates. See also Bernartzi and Thaler (2004).

more we use it.⁷ There is emerging evidence that the poor find it harder to save, in part because they must overcome self-control challenges over and over again.⁸

The poor’s immersion in physical cash perpetuates their marginalization from the formal economy

The dominance of physical cash in the lives of the poor doesn’t just make it harder for them to manage their finances – it also perpetuates their marginalization from the formal economy by making it more expensive to serve them.

The first barrier is the cash handling infrastructure required to transact with cash-based customers. A bank or utility company can transact with a digitally-embedded customer simply by linking their corporate ‘digital’ account to the customer’s ‘digital’ account. In contrast, any provider wishing to serve a cash-based customer must first establish physical infrastructure to interface with their cash. This can take many forms: governments deliver social transfers to poor and rural households via armored trucks; utility companies build cash acceptance networks; microfinance institutions pay loan officers to physically collect and disburse loan payments. The cash-digital divide thus drives a wedge between poor households and the formal economy by forcing banks, utility providers, and other institutions to deploy costly infrastructure to store, transport, and process their cash.



The second barrier is that providers know very little about cash-based customers. This is because cash transactions leave no digital record. Beyond a cash-based citizen’s local geography, no providers know that a poor client regularly repays his loans to the local moneylender and sends money to his family at the end of each month. This information asymmetry causes providers to lump low- and high-risk customers into the same risk pool, thus raising the cost low-risk customers must pay to access financial services and

⁷ Vohs et al (2008), “Making Choices Impairs Subsequent Self-Control: A Limited-Resource Account of Decision Making, Self-Regulation, and Active Initiative.” *Journal of Personality and Social Psychology*. Vol. 94, No. 5.

⁸ Vohs and Faber (2007), “Spent Resources: Self-Regulatory Resource Availability Affects Impulse Buying.” *Journal of Consumer Research*. 33: 537-548.

⁹ Mas (2012), “Payments in developing countries: Breaking physical and psychological barriers,” *Transaction World Magazine*.

preventing some providers from serving this customer segment altogether. This market failure is most clearly seen in insurance and credit markets,¹⁰ but it even applies to savings and payment products which pose fraud and money laundering risks to providers who don't have visibility into the financial histories of their customers. The anonymity of cash can also extend to spot transactions in the marketplace: market traders may be reluctant to buy goods from a new vendor if their anonymous cash-based transactions are not backed up with a digital record.

Admittedly, connecting poor people to a digital financial system will not solve *all* the cost barriers to reaching poor people with financial, utility, and other services. However, it will strip substantial cost out of the system, paving the way for more robust commercial efforts to serve the poor.

Can digital payments catalyze micro-insurance provision?

Micro-insurance providers have struggled to find a viable model for serving the poor. While the cost of collecting and disbursing cash-based insurance payments hurts the business case for micro-insurance, it is not the primary barrier to insurance delivery. A far bigger challenge is reaching a large, diverse pool of customers that is insulated against covariant risk and adverse selection.¹¹ The propagation of digital payment systems in poor and rural communities can catalyze the micro-insurance industry by creating a digital 'pipe' through which micro-insurance providers can tap into a larger and more diverse pool of customers. On its own, this won't solve the problem of adverse selection, but it will help address covariant risk by allowing insurance providers to pool risk across diverse geographies, age segments, income segments, and occupations.

What does digital financial inclusion look like?

So what is needed to bridge the cash-digital divide? Fundamentally, we need to build low-cost "on-ramps" that enable poor people to convert their physical cash into digital money, and we need to integrate those on-ramps with formal institutions so poor people can meet their financial needs in digital form. Once poor customers are transacting (at an affordable price) with their peers, banks, governments, and utility companies, we will have achieved digital financial inclusion. Figure 1 shows a schematic of the infrastructure components that must be in place to realize this vision:

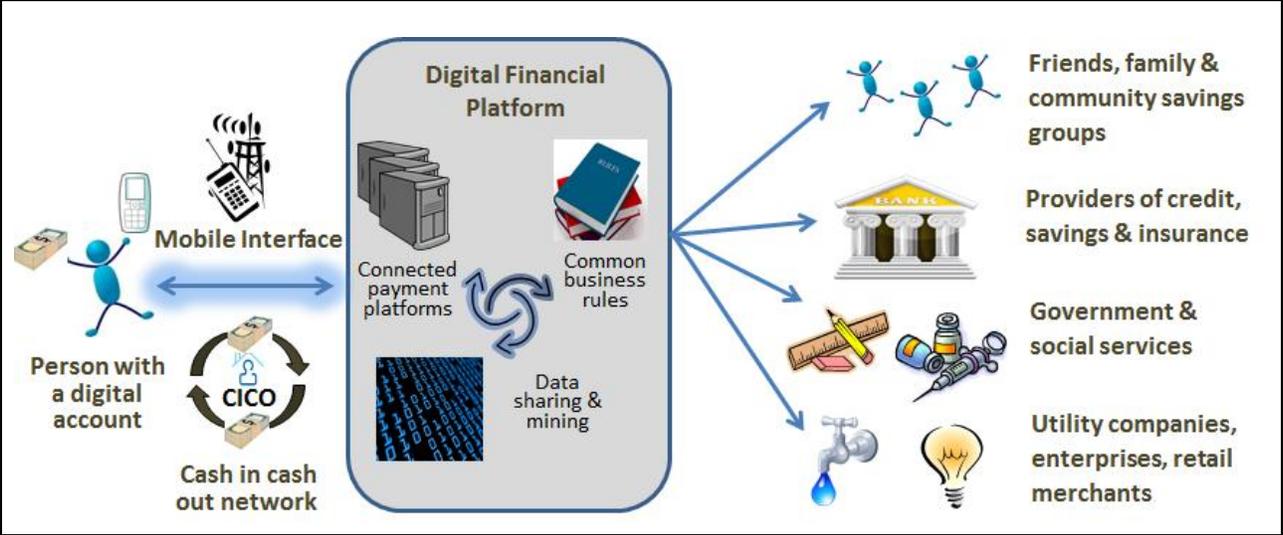
- Connectivity – such as a telecoms network – that enables customers to communicate with the provider's transaction authorization system through a mobile phone or other digital interface
- Cash-in/cash-out (CICO) networks that enable poor customers to convert their physical cash into digital money (and vice versa). In the long-run, we expect the number of CICO points will gradually decline as people conduct more transactions in digital form.
- A system for capturing and verifying the identity of customers
- A virtual account that enables digital payment connectivity
- A payment platform (or multiple interconnected platforms) that enables customers to transact with counterparts, regardless of their payment provider

¹⁰ Stiglitz and Weiss (1981), "Credit rationing in credit markets with imperfect information," *American Economic Review*. Vol. 71.

¹¹ Covariant risk describes a situation wherein individuals are exposed to the same risk or combination of risks at the same time. Adverse selection describes a situation wherein an individual's demand for insurance is correlated with her risk of loss (i.e. higher risk customers buy more insurance), and the insurer cannot build this higher risk into the price of insurance.

- Common business rules and technical standards that enable providers to settle and clear cross-platform payments
- Common business rules and technical standards that enable data sharing and data analytics across providers, both to facilitate product development and prevent fraud
- A payment platform that is cheap enough to serve sub-\$2/day users and can accommodate a range of customer use cases beyond money transfer

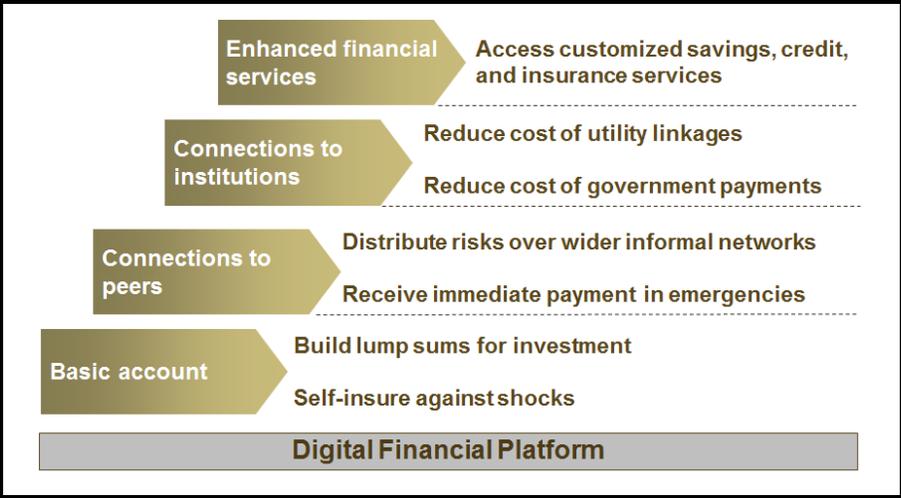
Figure 1: Digital financial platform connecting poor people to their peers and a range of providers



What are the likely welfare impacts of an inclusive digital financial system?

It’s a fine vision, but what would it mean for poor people? A thin but growing body of evidence suggests that once poor households are connected to an integrated digital financial system, they will experience direct welfare benefits through several channels, including: 1) access to a basic store-of-value account; 2) payment connections to peers; 3) payment connections to institutions, like utility companies, enterprises, and governments; and 4) access to enhanced financial services. We describe below each of these impact channels and summarize the evidence to-date testing the welfare benefits of each channel.

Figure 2: The welfare impact channels of a digital financial system



1) Access to a basic account

Poor households often need to accumulate sums of cash to invest in their micro-enterprises, purchase farming inputs like seeds and fertilizer, pay for school fees, or finance major life events like a pregnancy or wedding. They also need to maintain “precautionary” cash to ensure that unexpected shocks, like a health emergency, crop failure, or job loss don’t push them deeper into poverty. Basic store-of-value accounts can help households build lump sums by enabling them to store and accumulate funds outside the home where they are less likely to be claimed by friends, relatives, or other household members.¹²

Impact evidence to-date: A randomized control trial (RCT) in western Kenya found that access to a traditional (non-mobile) savings account led to a 45% increase in productive investment, 27-40% higher personal expenditures, and 10-20% higher daily food expenditures among poor female daily income earners.¹³ Women in the treatment group were also better able to cope with health shocks, like malaria, without having to draw down working capital. The researchers posit that the accounts helped the women save by enabling them to resist claims from spouses, friends, and neighbors and instead invest those funds in their businesses. Interestingly, the study found no impact on male entrepreneurs, perhaps because they were less savings-constrained than their female counterparts.

2) Connections to peers

Cash does not travel well. It is particularly costly and difficult for people to move physical cash over distances, whether for migrant remittances or informal insurance transfers across friends and family. Once customers are connected to a digital payment system, they are able to transfer money instantly and cheaply to friends, family, and business partners. Among other benefits, this helps households share risk by *expanding* the geographic reach of informal risk-sharing networks. When a child comes down with malaria, for example, her parents can draw upon a wider support network of friends and family to help cover her medical fees. And because digital payments enable *instant* transfers, support networks can address shocks immediately, before their effects worsen.

Impact evidence to-date: A longitudinal study of 2,016 households in Kenya found that M-PESA users were able to absorb large negative income shocks (such as severe illness, job loss, or harvest failure) without any reduction in household consumption.¹⁴ In contrast, statistically comparable households who weren’t connected to M-PESA experienced, on average, a 6-10% reduction in consumption in response to similar shocks. The researchers also found that, following a shock, households with access to M-PESA received funds from a *larger* network of senders and from senders located further away. Digital payments thus appear to strengthen and expand informal insurance networks among poor households.

¹² This is not to say that access to a savings account generates *more* impact than access to reasonably-priced credit. Indeed, credit can provide households with much-needed liquidity to invest in a business, buy a home, or deal with a health emergency. We merely argue that access to an account generates sizable welfare benefits on its own.

¹³ Dupas and Robinson (2010), “Savings constraints and microenterprise development: Evidence from a field experiment in Kenya”, NBER Working Paper w14693.

¹⁴ Suri and Jack (2011), “Risk sharing and transaction costs: Evidence from Kenya’s mobile money revolution.” Working Paper.

3) Connections to institutions

The ability to digitally transfer money among peers is clearly beneficial, but we expect even larger welfare gains will emerge once poor people can transact digitally with formal institutions. It is difficult for governments, utility companies, enterprises, and other institutions to send and receive cash from poor households. However, once poor households are connected to a digital financial system, they can link their personal account to the company's corporate account to enable digital payments. Electricity bills could be paid with a push of a few buttons instead of traveling to a distant office and waiting in a queue with a handful of cash. Social welfare payments could be sent directly to a beneficiary's account without funds being siphoned off by intermediaries and at a fraction of the cost of deploying armored trucks in poor and rural areas.

Impact evidence to-date: Unfortunately, only a few rigorous studies have assessed the impact of digital connections between institutional providers and poor people. An RCT in Niger found that enabling female food security beneficiaries to receive payment through their mobile phones reduced the average distance recipients had to travel to receive their transfers from 4km to 0.9km.¹⁵ Also, because the funds were deposited directly into an account rather than in cash, the women in the treatment group reported having more control over their money. Treatment households also had higher diet diversity and depleted 11% fewer assets during the study period.

A McKinsey assessment of India's government-to-person payment system estimated that connecting Indian every household to a digital payment system and automating government payment flows could save the Indian government up to \$22 billion per year, equal to 8% of the total flows between the government and its citizens. 80% of these savings would come from reduced leakages to unintended recipients. The remaining savings would come from the lower administrative cost of making payments digitally rather than using cash or checks.¹⁶ To put these benefits into perspective, these savings could alternatively boost India's welfare spending by 25% or fund the cost of India's Food Security Act (estimated at \$12 billion annually) for nearly two years.

4) Connections to enhanced financial services:

The expansion of digital payment platforms offers the opportunity to link poor people with providers of savings, credit, and insurance products. Digital infrastructure may not automatically lead to higher savings rates (witness the level of over-indebtedness in the United States), but it does create the opportunity to embed poor people in a system of automatic deposits, scheduled reminders, and positive default options than can help people overcome psychological barriers to saving.¹⁷ Moreover, because digital transactions leave a "digital footprint," they can be used to construct portable financial histories of poor customers, enabling providers to develop customized credit and insurance services that match individuals' unique financial needs and risk profiles.¹⁸

¹⁵ Aker, Boumnijel, McClelland, and Tierney (2011), "Zap it to me: The short-term impacts of a mobile cash transfer program." Centre for Global Development Working Paper #268.

¹⁶ McKinsey & Co. (2010), "Inclusive Growth and Financial Security: The Benefits of E-payments to Indian Society."

¹⁷ Madrian and Shea (2002), find that setting automatic enrollment in 401(k) plans as the default option led to a 50% increase in participation. Similarly, Karlan et al (2011) conducted RCTs in Bolivia, Peru, and the Philippines and found that "goal-specific" savings reminders (e.g., for housing, school fees) increased savings by 16%.

¹⁸ Kumar and Muhota (2012), "Can digital footprints lead to greater financial inclusion," CGAP Brief.

Impact evidence to-date: Several studies have tested the link between structured savings services and household welfare. In the Philippines, researchers offered clients “commitment” savings accounts which allow savers to “lock away” funds that they cannot withdraw until a pre-determined date or until a pre-determined amount of deposits was reached.¹⁹ The product was taken up by only 13% of those who were given the option, but still led to an 80% increase in formal savings balances (even averaging in those who didn’t take the offer). Another RCT in Malawi found that farmers who were able to put their harvest proceeds into a commitment account invested 26% more in farming inputs, had 22% higher farm revenues, and 17% higher daily expenditure than those who were not offered an account.²⁰

On the credit side, the evidence is more mixed. RCTs in India, Morocco, and the Philippines tested the impact of micro-credit on poor households and all found that credit access did not improve household welfare in the short-run (12-24 months).²¹ The Indian study found that credit access helped spur small business creation. The Moroccan study found that credit access led to increased farming activity. And the Philippines study found that credit access helped borrowers cope with shocks. However, when taken together, these studies confirm that micro-loans at 20%-60% interest do not lead to a big increase in household welfare, at least in the short-run. We suspect the propagation of digital payment systems in poor and rural communities can enhance the impact of micro-credit through three channels: 1) by enabling providers to send and receive loan payments in digital form rather than in cash, thus reducing operating costs and the interest rates charged to customers; 2) by creating digital financial histories for poor customers, thus enabling providers to create customized loans products that are suited to the unique needs of each customer; and 3) creating a more competitive micro-lending market by enabling customers to transact digitally with a wider range of lenders.

While the existing body of evidence demonstrates positive impacts for improving *individual* pieces of the broader financial ecosystem (e.g. improved savings tools, more efficient payment systems), none test their *cumulative* impact. We believe assembling all the pieces into a full suite of digital financial services will generate welfare impacts that are multiples of the impacts documented to date.

A pathway to digital financial inclusion

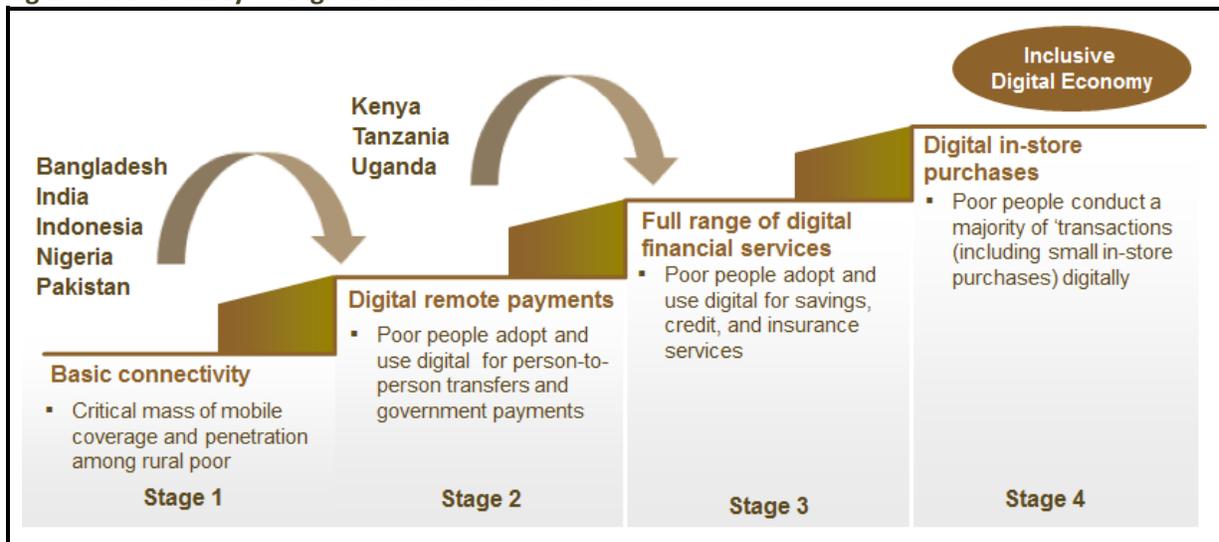
So how do we realize this vision? First, we must recognize that digital financial inclusion is a multi-stage process. We cannot expect poor customers to migrate from a cash environment to a digital economy in one giant leap. Citizens in even the wealthiest countries still use cash for small purchases at the local store, so it’s unlikely that developing economies will go cash-*less* in the near-term. Instead, countries will most likely pass through several stages of market development along the path to an inclusive digital economy. Figure 3 depicts these stages and categorizes several countries based on their progress in leveraging mobile phones or other digital interfaces to connect large numbers of their citizens to a digital financial system. We recognize that not all markets will follow this linear path. Indeed, we expect some countries will chart unique pathways which leapfrog or even reverse certain stages. However, our current read of the evidence suggests that, *in aggregate*, countries will tend to follow a pathway to digital financial inclusion which roughly mirrors Figure 3 below.

¹⁹ Ashraf, Karlan, and Yin (2009), “Tying Odysseus to the Mast: Evidence From a Commitment Savings Product in the Philippines,” MIT Press Quarterly Journal of Economics

²⁰ Brune, Gine, Goldberg, and Yang (2011), “Commitments to Save: A Field Experiment in Rural Malawi”, World Bank Policy Research Working Paper 5748.

²¹ See Banarjee, Duflo, Glennerster, and Kinnan (2010), Karlan and Zinman (2011), and Crépon, Devoto, Duflo, and Parienté (2011).

Figure 3: A Pathway to Digital Financial Inclusion²²



Stage 1: Connectivity in poor and rural areas

At the most basic level, a country must have communications infrastructure in poor and rural areas to enable customers and CICO agents to communicate with the provider’s transaction authorization system through a mobile phone or other digital interface. Fortunately, mobile penetration in developing countries has increased exponentially over the last decade and these networks are projected to grow steadily in coming years. The number of mobile connections in Africa, for example, increased from 34 million in 2002 to 710 million in 2012 and is expected to exceed 1.0 billion by 2016.²³ Mobile networks in South Asia and Latin America are growing at similar rates. This explosion in connectivity provides a foundation to extend digital payment infrastructure into poor and rural communities.

Despite these advances, material gaps in mobile coverage and penetration remain, particularly in countries with state-owned telecoms monopolies or a high degree of civil unrest. Ethiopia and the Democratic Republic of Congo, for example, have mobile penetration rates of only 22% and 25%, respectively.²⁴ In these countries, there is no clear *digital* pathway to widespread financial inclusion in the near-term, suggesting that non-digital models, like savings groups or microfinance institutions, will have to fill the gaps until the communications infrastructure expands.

Stage 2: Digital remote payments

Once the connectivity layer is in place (Stage 1), providers can undertake the considerable task of extending CICO retail networks into poor and rural communities and connecting customers to the digital payment “grid” (Stage 2). Remote payments – such as migrant laborer remittances, informal networks of friends and families, and government social transfers – are effective “gateway” products to fuel this

²² While Pakistan is home to a vibrant mobile money market that is reaching large numbers of poor customers, the vast majority of users do not yet have accounts. Instead, they conduct over-the-counter (OTC) transactions where the agent processes the transaction on the customer’s behalf. OTC customers have no account and thus no mechanism to store, access, or accumulate funds. Because OTC offers no vehicle to deliver savings, insurance, or other services beyond payments, we categorize Pakistan as a Stage 1 country.

²³ Wireless Intelligence estimates as of September 30 of each year.

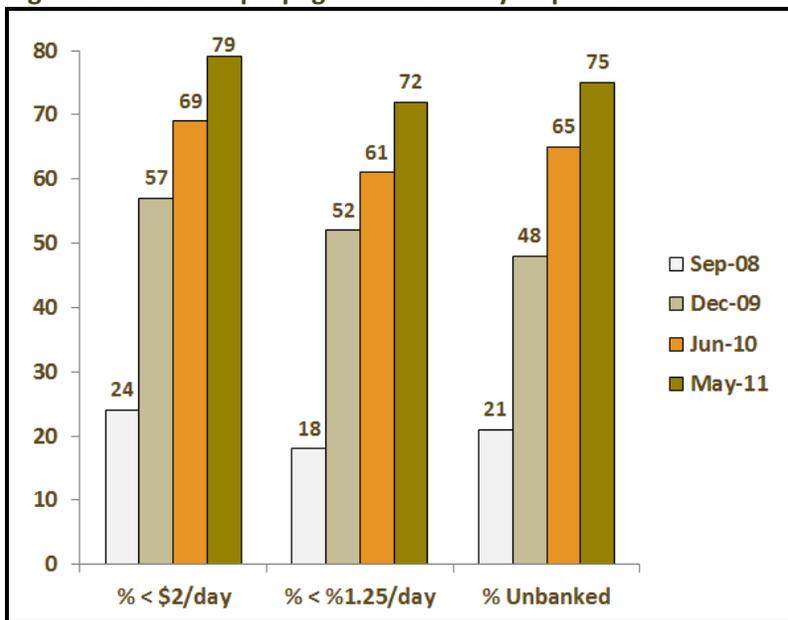
²⁴ Ibid.

adoption. Indeed, domestic remote payments have been the lead products for all mobile money systems which are now serving more than one million active customers.

One advantage of leading with remote payments is that it helps overcome trust barriers that may prevent people from testing a new digital platform. New customers can make a payment, call their recipient, and immediately validate that their transaction was processed securely. In contrast, savings and insurance are both *inter-temporal* services – the trustworthiness of the service is verified over a much longer period. Thus, starting with payments allows customers to build trust in the new digital system by completing several transfers.

Another advantage of leading with remote payments is that there appears to be considerable pent up demand for a better way to make remote payments. A Gallup survey of 11 Sub-Saharan African countries found that 53% of adults (equivalent to 134 million people) had paid or been paid by a “distant counterparty” in the prior 30 days.²⁵ 60% (equivalent to 79 million people) *exclusively* use cash-based channels such as informal couriers or sending money by bus. Several providers have tapped into this market by extending payment platforms deep into poor and rural communities. A longitudinal survey of 2,016 Kenyan households found that, only four years after M-PESA’s launch, 86% of Kenyan households and more than 70% of Kenya’s poor and unbanked households have at least one M-PESA user.²⁶

Figure 4: M-PESA’s propagation into Kenya’s poor and unbanked populations

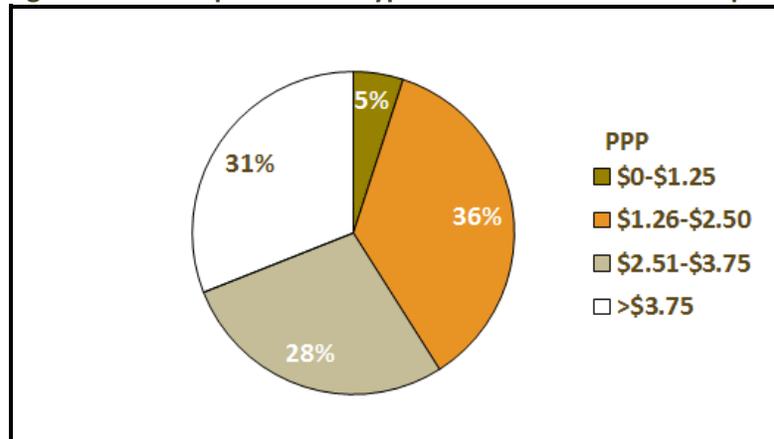


Another survey in Pakistan used poverty scorecards to estimate the income profile among users of Tameer Bank / Telenor Pakistan’s Easypaisa service. The survey found that, just 16-months after the launch of the service, 41% of Easypaisa’s users lived on less than \$2.50 per day.

²⁵ Godoy et al (2012), “Payments and Money Transfer Behavior of Sub-Saharan African Households.” (www.gallup.com)

²⁶ Jack and Suri (2012), “M-PESA extends its reach” *Mobile Money for the Unbanked Blog Post*. The survey results reflect the non-Nairobi sample, so these figures likely *under-state* the national penetration rates.

Figure 5: Income profile of Easypaisa client base 16-months post-launch



Remote payments may help trigger adoption, but here is the real key to leading with payments: it allows policymakers to separate the regulatory risks posed by payments providers from those posed by credit-issuing institutions. Rather than treat the provision of financial services as an “all or nothing” proposition, requiring full-fledged prudential regulations any time a provider accepts funds from the public, regulators can create a class of non-bank e-money issuers who offer basic accounts and payments services, but do not *intermediate* those funds. The core principle is that a provider that accepts funds from the public and places 100% of those funds in pooled accounts at supervised banks does not create prudential or liquidity risks.²⁷ Of course, regulators must still mitigate the technology, operational, and consumer protection risks associated with payment systems, but traditional prudential banking regulation would not be necessary given the 100% provisioning requirement.

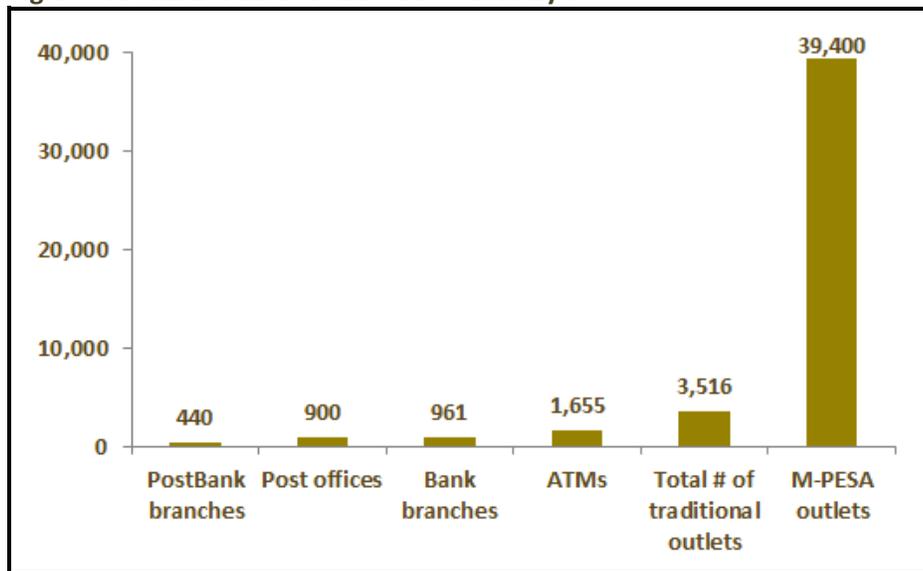
The European Union’s Directive on Payment Services offers a template for separating the risks posed by payments from those posed by financial intermediation. The EU Directive adopts a multi-tier framework that distinguishes between 1) payments institutions which do not issue electronic money (e.g. VISA); 2) electronic money issuers who do not intermediate funds; and 3) credit-issuing institutions. This three-tier system reflects the different levels of risk posed by payments versus financial intermediation.

By isolating the risks posed by payments, policymakers can marshal the assets of *non-banks* with deep experience in distribution, such as mobile operators and fast-moving goods companies, to extend CICO networks into poor and rural communities. Indeed, because banks are equipped to provide financial services (Stage 3), we need not assume that they are equipped to extend payments infrastructure into poor and rural areas (Stage 2). Regulators in Kenya, Tanzania, Uganda, and Pakistan (among others) have carved out regulatory space to allow non-banks to play a central role in building digital payment platforms. This policy move has triggered dramatic expansions of CICO points in those countries. In Kenya, for example, there are now ten times more M-PESA outlets than bank branches, ATMs, post offices, and Kenya Post Bank branches in the country (see Figure 6 below). Outside Kenya, branchless banking systems in Pakistan (27,000 outlets)²⁸ and Tanzania (20,000+ outlets) have dramatically increased the number of transactional points in those countries.

²⁷ For a detailed analysis on how to regulate non-bank e-money issuers, see Tarazi and Breloff (2010).

²⁸ State Bank of Pakistan Branchless Banking Newsletter, January to March 2012.

Figure 6: Formal transactional outlets in Kenya²⁹



Stage 3: Digital savings, credit, and insurance services

The expansion of digital payment platforms has linked large numbers of poor people to digital accounts, but no country has successfully leveraged mobile connectivity to transition from Stage 2 (availability of digital payments) to Stage 3 (widespread availability of digitally-enabled savings, credit, and insurance services). Even in Kenya – where 86% of households have access to M-PESA³⁰ – few customers are using enhanced financial services over the platform. What is impeding this migration?

One barrier is pricing. Most mobile money deployments are conducive only for relatively large (>\$15) payments. For example, Easypaisa in Pakistan and M-PESA in Kenya charge customers 3% and 6% respectively to make a \$5 digital transfer. If every \$5 transfer from a mobile money system to a bank, insurance company, or other provider costs 3%-6%, it will be difficult to offer financial products premised on micro-deposits, micro-insurance premium payments, or micro-loan repayments.

Another challenge is technical integration. To become a channel for the delivery of financial services, most mobile money platforms would first have to improve their application programming interface (API)³¹ to enable a more seamless integration with providers of savings, credit, and insurance services. M-PESA, for example, does not make their API available to application developers, so when Safaricom makes changes to the M-PESA user interface, application providers that leverage the M-PESA platform are left scrambling to re-engineer their integration with M-PESA's API – a cumbersome process.

A third challenge is regulatory. In an ideal market, a range of savings, insurance, and credit providers would compete to offer customers the best possible products over existing mobile money platforms. This

²⁹ M-PESA outreach statistics are as of March 2012. Data was pulled from Safaricom Annual Report 2011/12, the IMF Financial Access Survey (2011), the Kenya Post website.

³⁰ Data from Jack and Suri (2012) longitudinal survey. See "M-PESA extends its reach." Mobile Money for the Unbanked Blog Post.

³¹ An application programming interface (API) is a set of instructions that allow software applications to communicate with one another. APIs can enhance the functionality of an existing software platform by allowing new applications to be built on top of that platform, while incorporating the functionality of the original system.

would allow customers to choose – among a range of providers – which offering is best for them. This “open platform” model would disaggregate the financial services value chain, enabling mobile operators and other front-end providers to concentrate on building and managing the CICO network, while enabling financial service providers to concentrate on financial product design.

There is a possibility that mobile money platforms will naturally migrate into open platforms. Indeed, platform providers like Facebook and Google have concluded that they are better off encouraging (rather than thwarting) third-party applications that drive usage over their platforms. Similarly, as the mobile money sector matures, providers may gradually open up their APIs and craft pricing agreements that are conducive for delivering financial services over their platforms. Indeed, once providers have built a CICO network, they may be motivated to drive as much volume as possible through their network.

On the flip side, there is a long history of communications providers using their dominant position in one layer of an industry to stifle innovation in other layers. AT&T, for example, used its control over America’s long-distance telecoms network to block potentially threatening innovations, such as fiber optics, mobile phones, and the Internet.³² In the same manner, mobile money providers may come to dominate both the communications (Stage 1) and payments (Stage 2) layers. These providers will want to exploit this control to dictate the terms of any pricing or API agreement to deliver banking services (Stage 3) over their platforms. This risk is particularly acute when dealing with a dominant provider, like M-PESA, which has become Kenya’s de facto national payment platform. If, in the long-run, mobile money providers don’t open up their platform to enable the delivery of enhanced financial services, regulators may have to consider interventions to facilitate the migration to Stage 3.

Of course, successful mobile money deployments made *significant* up-front investments to build their mobile money systems. Their incentives to build these systems in the first place - and the incentives of providers in other markets to do the same - depend on adequate returns to these investments. Hence, policymakers seeking to facilitate the transition from Stage 2 to Stage 3 will have to strike a delicate balance: identifying policy interventions that encourage financial service innovation over digital payment platforms while preserving incentive to build and maintain those platforms.

A managed approach to interoperability

CGAP and Bankable Frontier Associates (2012) present a useful framework for thinking about retail payments interoperability.³³ First, they stress that retail payments interoperability is not an objective in its own right; rather it is a means to achieve other desirable objectives. Policymakers should carefully consider what objectives they aim to achieve through interoperability while distinguishing between *intermediate* objectives (e.g. stimulating competition) and *ultimate* objectives (e.g. achieving universal financial inclusion). Second, policymakers should not treat interoperability as an all-encompassing proposition. Instead, they should tailor their analysis to different payment use cases, as defined by 1) the account type (bank account, mobile wallet); 2) the transaction type (withdrawal, real time transfer); and 3) the channel (ATM, agent, PC). Each use case will require a *customized* policy and commercial pathway for achieving interoperability. Third, policymakers should not be boxed in by the false binary of “intervene now” or “wait until problems arise.” Instead, they

³² For more on the history of information industries in the United States, see Tim Wu (2010), The Master Switch: The Rise and Fall of Information Empires. New York: Alfred Knopf.

³³ CGAP / Bankable Frontier Associates (2012), “Interoperability and the pathways towards inclusive retail payments in Pakistan”

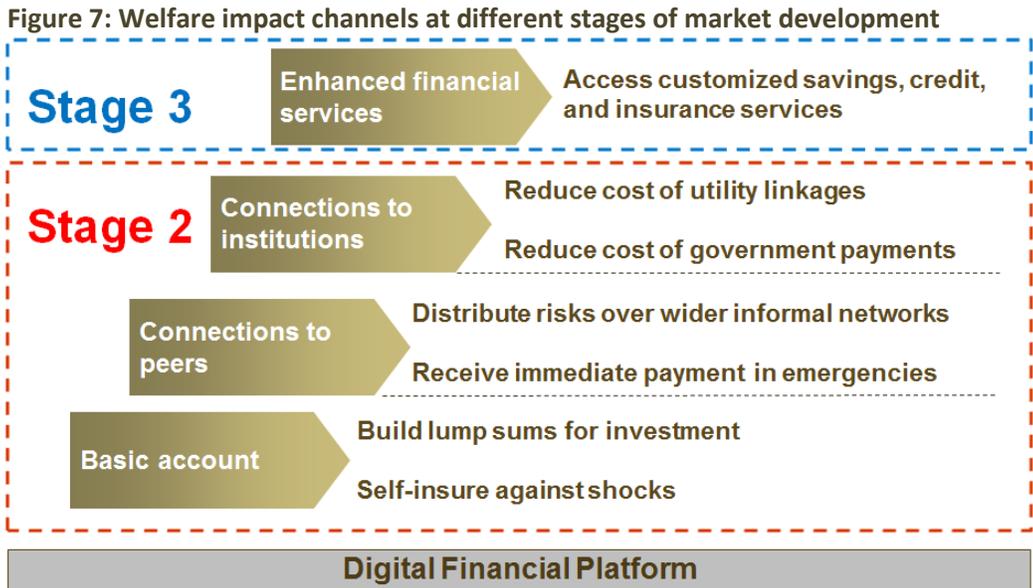
can pursue a “managed approach” to interoperability by establishing a sequence of milestones for achieving interoperability for clearly defined use cases. Then, if the milestones are missed, a regulator can carefully consider interventions that will help sustain progress towards its end goals.

Stage 4: Digital in-store purchases

The final stage in the quest for an inclusive digital economy is to encourage people to make small daily purchases (for food, cleaning supplies, etc.) in digital form. This will close the digital loop, decreasing the leakage of money back into cash and increasing the velocity of digital money. However, before customers will make in-store purchases digitally, significant friction and cost must be removed from each transaction. Providers will also have to deploy new business models and acquiring strategies because the current POS- and card-based approaches create a cost floor that is too high for serving poor customers. In developed economies, competitive pressures to reduce transaction costs and allow for micro-transactions has unlocked a number of hardware (e.g., Square) and software (e.g., PayPal) innovations that have the potential to change the traditional merchant structure for retail payments, as well as compress the on-boarding costs and equipment required to process electronic payments.

The migration from Stage 3 to 4 will be a huge undertaking, but ultimately necessary to enable people to meet all their financial needs in digital form. In the long-run, we expect that merchants in developing countries will be driven to digital platforms in order to reduce their cash-handling costs, minimize cash risk, and – particularly for distributed retail networks that have to manage their shop managers remotely – enable better monitoring of transactions across the network.

Fortunately, most of the welfare gains for poor households are concentrated in Stages 2 and 3. As shown below, in a Stage 3 economy, poor people will have access to 1) a basic account, 2) payment connectivity to peers, governments, and utility providers, and 3) payment connectivity with financial service providers to access savings, insurance, and loan products. In contrast, the migration to Stage 4 would yield only *marginal* welfare enhancements by increasing the convenience of in-store purchases. Given all this, the financial inclusion community should concentrate its energies on facilitating the Stage 1 to 3 progression rather than worrying about the feasibility of achieving a cash-less society.



Three unanswered questions that will shape the Stage 1 to 3 progression

2.5 billion adults remain cut off from the financial system.³⁴ Mobile money deployments in Kenya, Tanzania, and Uganda have connected large numbers of poor people to digital payment platforms (Stage 2), but none has successfully leveraged mobile infrastructure to enable large numbers of poor people to access savings, credit, and insurance (Stage 3).

So how do we accelerate the transition from Stage 1 to 3? We outline below three unanswered questions which lie at the heart of the Stage 1 to Stage 3 progression. The sector's ability to address these questions will in large part determine how quickly we bridge the cash-digital divide.

1. Are there bank-led pathways from Stage 1 to 2? While mobile operators have demonstrated their ability to extend CICO networks into poor and rural communities and to onboard customers onto digital payment platforms, banks have struggled to do the same. Banks' difficulties stem from a range of factors, including their lack of access to a secure communications channel in poor and rural areas, their reliance on a float- (rather than transaction-) based revenue model which tends to discriminate against poor and rural customers, and their lack of experience managing extensive, multi-layered distribution networks. Given banks' struggles to-date, should we conclude that the migration from Stage 1 to 2 hinges *entirely* on regulators permitting non-banks to contest the payments space? Or are there bank-led paths to Stage 2?
2. What policy interventions (if any) are required to facilitate the Stage 2 to 3 progression? Government can facilitate the progression from Stage 1 to 2 by creating a regulatory environment that helps catalyze this progression and by driving government payment flows through digital (rather than cash) channels. However, the government's role in the progression from Stage 2 to 3 is less clear. For example, in markets where mobile operators have built widespread digital payment platforms, is policy intervention necessary to ensure that they do not use their control over the payments layer (Stage 2) to become the gatekeeper for innovations in the financial services layer (Stage 3)? Or will providers have commercial incentive to enable financial service innovation over their platforms? Should mobile money platforms ultimately be categorized as "common carriers" for financial service providers, such that they must offer standardized pricing and API access to any provider? And what is the appropriate timing for intervention, given the *considerable* risk that regulators will intervene too early and stifle providers' incentive to build-out these payment platforms in the first place?
3. Will providers migrate to Stage 3 by marketing discrete financial products or by enabling users to 'self-construct' their own products? Under the traditional financial services model, providers market a range of *discrete* savings, credit, and insurance products. If a mother needs to save for her child's school fees, she can open a time deposit account. If she needs to make daily transactions, she can open a current account. Mas (2012) argues that providers will struggle to market a range of discrete financial products through a mobile interface, and customers will struggle to manage these products on basic mobile phones.³⁵ Instead, he advocates for developing a more intuitive user interface that would enable customers to "self-construct" customized financial services. Customers could do this by earmarking future payments for different purposes. For example, a farmer could take his harvest earnings, earmark a portion towards a future payment for fertilizer and seeds, earmark a portion to

³⁴ Demircuc-Kunt and Klapper (2012), "Measuring Financial Inclusion: The Global Financial Inclusion Indicators," *World Bank Policy Research Working Paper #6025*.

³⁵ Mas (2012), "Making Mobile Money Daily Relevant." Working Paper.

pay his daughter's school fees, and use the remainder to pay him and his family a monthly salary until the next harvest. Will customers be willing and able to self-construct financial services in this manner? And will this functionality allow markets to migrate from Stage 2 to 3 without first cultivating bank-mobile operator partnerships for the delivery of financial products?

The answers to these questions will emerge when stakeholders step outside their comfort zones to test new commercial and regulatory models. Banks, for example, are unlikely to cultivate "bank-led" pathways to digital payments in poor and rural communities (Stage 2) if they try to maintain a tight grip on all aspects of their distribution channels. Instead, they will have to give their distribution partners (e.g. mobile operators, retail distributors) enough compensation and branding space to incent them to do the heavy lift of building a national CICO network. Mobile operators are unlikely to facilitate the migration from payments (Stage 2) to financial services (Stage 3) unless they loosen their grip on the user experience. We suspect mobile operators will have to convert their closed APIs into open platforms that make it easier for application providers to integrate with their payment systems. And policymakers are unlikely to see material gains in digital financial inclusion if they cling to regulatory models which fail to distinguish between the risks posed by payments from those posed by financial intermediation. The digital pathway to financial inclusion will indeed be carved by those willing to revisit long-held assumptions in financial services regulation, telecommunications, and banking.

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