## Big Questions in Payments

Recent research has revealed how far we still are from enabling financial access for poor households. Half the world is unbanked (Demirgüç-Kunt and Morduch, 2012)[1]. Findex (The World Bank, 2012)[2] surveys provide useful data in understanding the gaps in access to financial institutions (Brennan, 2012)[3] and credit (Brennan, 2012)[4] in many countries, mainly in the developing world. However, these same populations are rapidly becoming "digitalized." According to GSMA, the number of GSM mobile connections in Africa and South East Asia has doubled since 2008 and has tripled in South Asia within the same period (GSMA, 2012)[5]. As more people have access to mobile phones and other new technologies, the potential for using these digital services to promote financial inclusion is growing.

Digital payments may be an important part of closing gaps around financial access. But how will digital payment systems be deployed? What design elements would create value for poor users? How can payment systems be the first stepping stone to other financial products? What are the regulatory issues surrounding mobile payment systems? This briefing note seeks to explore these questions and provide additional resources on these and related topics.

### What is needed to make digital payment systems valuable and attractive for poor households?

While digital payment systems have made substantial in-roads in a number of countries, the pace of adoption, growth, and penetration has generally been slower than expected. For the last several years much of the conversation around lagging deployments has focused on recalcitrant regulators and financial institutions. Now, attention is beginning to be paid to understanding the real value—and costs—of digital payment systems for poor households.

Cash is the main way of exchanging value for most poor households around the world, whereas the use of payments from checks to cards to direct transfers are much more common at higher incomes. While cash is generally reliable, available, and cheap in relation to alternatives, it comes with significant risks and costs, often hidden. Furthermore, while cash is easy to use locally, poor households often need to transact at significant distances. Using cash, then, requires informal cash transfer mechanisms, such as bus networks and *hawala* couriers. Using these mechanisms is expensive in terms of direct charges, risk of fraud, and the opportunity cost of the time both to arrange transfers and the delay in the transfer reaching the recipient.

---

[1] Cull, R., A. Demirgüç-Kunt and J. Morduch (2012), *Banking the World.* The MIT Press.

[2] The World Bank (2012), "The Global Financial Inclusion (Global Findex) Database," The World Bank – Data and Research.

[3] Brennan, K. (2012), "Unequal Access," Financial Access Initiative.

[4] Brennan, K. (2012), "How do people borrow?," Financial Access Initiative.

[5] GSMA (2012), *Mobile Money for the Unbanked: Annual Report 2012*, GSMA.

By making cash virtual, digital payment systems ought, in principle, to help people conduct some important part of their financial transactions at a lower cost while also leaving more of a financial trail, which might help them get credit or handle business disputes.

But advocates of the theoretical benefits often miss the costs incurred by users. First, digital payment systems usually charge per transaction fees, fees which are far more salient than the hidden costs of cash. Second, the transition from cash to digital payments does involves effort and cost for users - from setting up accounts and getting comfortable with new technologies to the additional mental burden of maintaining two different stores of value.

Several factors affect the ability for digital payment systems to provide enough benefit to consumers to outweigh these costs:

1. **Network penetration**. The usefulness for an individual of joining a digital network grows with the number of people and institutions that are connected to it. A larger network is clearly more useful because users can send and receive money to and from a larger range of counterparties. This creates a snowball effect: new systems are hard to market because they do not offer sufficient value to users, but once a critical mass of subscribers is reached they can expand very rapidly as the potential value of being part of the network grows exponentially rather than linearly [see Metcalfe's Law (Wikipedia, 2013)[6]]. However, this effect makes it difficult for several systems to co-exist unless they are interoperable.

2. **Availability of cash in/out points**. For people living in the informal economy, the usefulness of a digital payment network also depends on how easy it is to convert physical cash into electronic value, and vice versa. There needs to be a sufficiently dense and reliable network of cash-in/cash-out points in order for people to try the system. Such an extensive infrastructure requires a large investment from the system provider to build cash-in/cash-out points and/or develop a sufficient agent network. This creates a chicken-and-egg problem, inherent in such two-sided markets: agents will be interested in offering cash in/out services only if there are enough customers using the electronic platform, but customers will not be interested in using the electronic service if there are few locations where they convert digital payments.

3. **Trust**. People need to learn to trust any money system that is unfamiliar. Moreover, trust in a digital payments network may need to be stretched over multiple players acting in concert: the account issuer or financial service provider, the mobile operator or communications service provider, the network of cash in/out points, and the billers and other businesses that are connected to it. Therefore, digital payments services need to operate without bugs or hiccups—trust in a financial system (digital or otherwise) can evaporate in an instant. That means that providers have to invest heavily in the short term to roll out an absolutely reliable system with the hope of long-term rewards, a daunting hurdle for many businesses. In the end, word-of-mouth and repeated use is the best way for users to get comfortable with the service and to learn to trust it.

4. **Acceptance as a Store of Value**. Money has two important functions. First, it serves as a means of exchange; second, it is a store of value between exchanges. Cash clearly serves both purposes well. To date, digital payments systems have generally not been perceived as fulfilling the second and their value is dramatically limited if they are only a means of exchange. Whether digital payments

[6] Wikipedia.org (2013), "Metcalfe's Law," Wikipedia.

are able to add this second function of money is primarily an anthropological question. Recent studies in Kenya have begun illuminating the predominant mental models that people use to manage their financial lives, and the role various forms of financial instruments (Johnson, 2013)[7]—from cash, to livestock, to M-Pesa, to bank accounts—play within social relationships (Greeley, 2013)[8]. Perceptions likely vary widely from place and place and will evolve over time. But the overall value of digital payments systems is highly dependent on the level to which they will ultimately be accepted as stores of value.

5. **Integration**. We now know that the financial lives of poor households are far more complex than had been traditionally assumed. Any new financial service has to integrate into a household's existing money management system to deliver value. Even where digital payment systems have the highest penetration, they do not fully replace cash or other financial instruments. While different forms of exchange or ways of storing value (Dupas and Robinson, 2013)[9] can be helpful aiding mental accounting (Schaner, 2013)[10] and conducting business (Drexler et al., 2011)[11], they do have to connect to people's existing systems. In addition to converting digital payments to cash, other forms of integration include connections with traditional bank accounts, integration with government payments (such as cash transfers and taxes), and information integration, which allows users to find or maintain information about transactions in understandable and useful ways.

**How will business models and partnerships affect the quality and value of digital payment systems?**

While digital payments may be an important part of closing the financial inclusion gap worldwide, the question remains - how will these systems be deployed? The needs and vagaries of local contexts within countries make it unlikely that any single company or system can adequately meet customer demands at an affordable price. The logic behind the use of new technology-enabled channels in many industries is to move from a vertically-integrated to a horizontally-layered service delivery model, such that each player is fulfilling a critical role with appropriate scale and business focus, and several players together deliver the full range of customer requirements. For instance, many "manufacturing" companies no longer own any factories but use various technologies to outsource actual production. In the financial realm, such a horizontally-layered system may be made up of mobile operators supplying secure messaging services, banks adding complementary financial services (like commitment savings accounts, loans, and insurance products) to the basic electronic account proposition; retailers handling cash in/out services; and billers and other businesses creating additional customer value. While there is obvious appeal to such a system, it raises an important question: What is the structure of contracts, investments, and business models that will enable it?

---

[7] Johnson, S. (2013), "Competing Visions of Inclusion in Kenya's Financial Landscape: The Rift Revealed by Mobile Money Transfer," Center for Development Studies and FSD Kenya.

[8] Greeley, B. (2013), "Kenyans Find the Unintended Consequences of Mobile Money," *Bloomberg Business Week*.

[9] Dupas, P. and J. Robinson (2013), "Why Don't the Poor Save More? Evidence from Health Savings Experiments," *American Economic Review*, 103(4): 1138-71.

[10] Schaner, S. (2013), "The Persistent Power of Behavioral Change: Long-Run Impacts of Temporary Savings Subsidies for the Poor," Working paper 2013.

[11] Drexler, A., G. Fischer, and A. Schoar (2011), "Keeping it Simple: Financial Literacy and Rules of Thumb," CEPR Discussion Paper No. DP7994.

Banks usually have legacy systems and products that tie them to a relatively high cost base. Culturally, they often do not have much of a tradition of developing ecosystems of players, and are not very familiar with the management of indirect channels. Most banks would require substantial internal change management to embrace a higher volume, lower margin business model.

Over the last decade, mobile operators in many countries have stepped in to try to fill the vacuum left by banks by offering mobile money services, with varying degrees of success. Unlike most banks, they have a true mass market vocation: well-known brands that are increasingly relevant for the poor; experience running extensive third-party retail channels; well-developed low-cost transactional (i.e. prepaid) account platforms; a deployed base of smartcards (SIM cards) with secure identity elements; and an increasingly ubiquitous mobile network that can be used for remote real-time transaction authorizations and confirmations.

However, there are a number of factors that have held mobile operators back. Most mobile operators do not have well-established service innovation processes and remain fundamentally a carrier of basic voice and data connectivity services. They struggle to supply the value added layers on top (content management, unified communication or business support services, and now mobile money). Also, most mobile operators develop mobile money solutions primarily to drive customer stickiness rather than a distinct revenue source, and that leads them to not want to interoperate their mobile money systems with those of their competitors. They cannot harness market-wide network effect, which undermines the commercial viability of individual systems. Banks–and, often, financial system regulators—distrust them, so many mobile operators find it difficult to forge partnerships to deliver a broader range of financial services through their mobile money platform.

It is not just banks or mobile telecom operators that are active in experimenting with new partnerships and business models. There are a range of third-party players who are vying to create more open, interoperable platforms. That includes the major payment card providers (e.g. VISA and MasterCard), technology platform providers (such as Obopay and Fundamo) and, in some countries, a variety of retail distribution players (such as airtime recharge distributors). However, building these open ecosystems requires relying on partners to deliver crucial elements of the service, which adds substantial risk and uncertainty for everyone involved. These open platforms are hard to assemble, especially while mobile operators control critical service elements.

These business models and partnerships must provide the security, interoperability (so that digital payments systems can integrate with household's money management systems) and low cost services necessary to provide value to users. Unfortunately, these three consumer needs are at least partially in opposition with each other. Security is costly. Interoperability presents security problems. To keep costs low, providers must believe they can recoup investments over time, which makes them fear interoperability.

**Can electronic payments be an effective gateway to other financial services?**

Retail electronic payments may be a gateway to other financial services in four distinct senses.

First, person-to-person payments in themselves can be a form of informal group-based financial services (Johnson, 2012)[12]. The ability to influence the size and timing of the remittances regularly receive from relatives in effect represents a leveraging of the sender's savings account for the benefit of the recipient. A single savings account can be relevant for, and impact the lives of, those who receive regular payments from it. When people can draw on person-to-person payments in situations of exceptional need, their families or social networks becomes informal insurance mechanisms (Yang and HwaJung, 2007)[13]. Indeed, research is documenting this social insurance via digitally-paid remittances in Kenya (Jack and Suri, 2011)[14] and Rwanda (Blumenstock et al., 2011)[15].

**Balancing the growth of electronic payment networks with the fight against crime.** Law enforcement officials worry that speedier and lower-cost electronic payment mechanisms can make it easier for criminals to engage in illegal activities. The ability to identify transacting parties and trace financial transactions has become a cornerstone of anti-terrorist policies. This condition has come at the cost of raising the information compliance requirements by both users and financial service providers at the time of transacting (and especially) account opening. Stiff know-your-customer rules on electronic modes of banking may be delaying the incorporation of large swathes of the population into electronic payment networks. On the other hand, it could be argued that a much higher level of use of electronic payments and financial services may help law enforcement authorities by increasing the number and range of transactions that can be traced electronically, making large cash payments suspect. Another potential longer-term concern is the misuse of financial data. The integrity and confidentiality of customer data becomes more important as more of a household's financial life is conducted digitally. There will also always be a lingering concern that the State itself –which sets the data use standards— could abuse these data for political or other purposes, for instance by tracking dissidents or selectively freezing their accounts.

Second, on the supply side, efficient and extensive retail payment networks can be important drivers for the extension of formal financial services to previously unbanked segments. To use a common analogy, payment networks might be akin to the rail infrastructure on which more sophisticated financial products can ride. Digital payment transaction histories may serve as a supplement or an alternative to a credit rating for evaluating potential borrowers. Thus, the existence of an efficient infrastructure on which to conduct individual transactions should, in theory, help in delivering other financial services.

Third, on the demand side, the likelihood of adoption of formal financial services might be strongly driven by the relative inadequacy of informal alternatives. In countries lacking good options for sending money or paying bills, the "pain points" in making remote payments may be a lot starker than for credit or savings. Thus, remote payments may have a stronger

[12] Johnson, S. (2012) "The search for inclusion in Kenya's financial landscape - The Rift Revealed," Center for Development Studies and FSD Kenya.

[13] Yang, D.C. and C. HwaJung (2007), "Are Remittances Insurance? Evidence from Rainfall Shocks in the Philippines," *The World Bank Economic Review* in 21 (20): 219–248.

[14] Jack, W. and T. Suri (2011), "Risk Sharing and Transactions Costs: Evidence from Kenya's Mobile Money Revolution," Working Paper, MIT, 2011.

[15] Blumenstock, J., N. Eagle, and M. Fafchamp (2011). "Charity and Reciprocity in Mobile Phone-Based Giving: Evidence from Rwanda", Working Paper, Centre for the Study of African Economies, 2011.

appeal because of a superior value proposition over alternatives. The ability to receive and collect money has indeed been a strong driver for account-opening in many countries. Once those accounts are opened, customers may over time leave higher balances or be cross-sold credit and insurance products.

Fourth, electronic payments may be a powerful way for new-to-banking customers to come to trust formal financial services and the financial institutions that are behind them, depending on how such systems are branded and the combination of service providers. Mobile payments are completed in real time, and customers can verify the security of the system by calling the other party to confirm receipt. With this possibility of immediate feedback, customers do not need to understand *how* the service works – they need only check that the payment went through. It takes much longer to build trust around savings services because savings is an inter-temporal service. Customers can check their savings balance day after day, but they never know whether it is truly safe until the moment of withdrawal. Thus, starting with payments allows customers to build trust by *completing* several basic transfers. Gradually, this trust may be extended to savings, insurance, and other inter-temporal products (Mas and Radcliffe, 2010)[16].

Given these arguments, it's plausible that payments could be a strong driver for financial inclusion. According to this view, poor people embrace remote payments because they address very clearly identifiable pain points and trust is easy to establish experientially. Poor customers then may go up a "ladder" of financial inclusion as they discover new services that both suit them and for which they are now economically addressable through the low-cost transactional platform.

**How can regulators balance access, security, stability, and consumer protection in digital payment systems?**

When it comes to setting regulation for basic access, regulators face a fundamental trade-off: What is the balance between making it easier for providers to create new access solutions oriented towards those currently left out and protecting the interests of a wide range of stakeholders once people do join the system? This question manifests itself in many ways.

1. **Balancing innovation with financial safety and stability.** A driver for expanding services to less profitable customer segments is generally competition from new entrants. These new entrants might apply different profitability hurdle rates, or they might bring new service concepts (adding value) and delivery models (lowering costs) that are optimized for the segment they are targeting. To enable innovation, regulations need to be sufficiently flexible to allow new players and business models while not imposing such high costs that innovators and investors are scared away. At the same time, regulators cannot abandon the responsibility to protect customers and the stability of the financial system as a whole. Regulators in many countries have sought to balance this tension by creating new types of licenses (Faz, 2013)[17], which give these players sufficient room to maneuver but do not require heavy upfront capital investment or ongoing compliance burdens, commensurate with the risks involved.

[16] Mas, I. and D. Radcliffe (2010), "Scaling mobile money," Bill and Melinda Gates Foundation.

[17] Faz, X. (2013), "A New Wave of E-Money in Latin America," *CGAP* Blog.

2. **Balancing interoperability of electronic payment networks with incentives to invest.** Electronic payment networks exhibit strong network effects, which means that overall network value will be maximized if there is effectively a single, nationally interconnected payment network. But early movers or larger providers often opt to maintain their customers on a closed network (i.e., not to interoperate with others) in an attempt to turn their relative size into a comparative advantage. There is a risk that if interconnection were mandated at an early stage of development of a network, it might actually kill off innovation and incentives for growth (Guadamillas, 2008)[18]. Regulators tend to be rightfully very cautious about enabling private monopolies within the financial system.

3. **Balancing consumer protection and ease of use.** Ensuring adequate financial consumer protection ought to be particularly important when people begin using formal financial services for the first time, or when they access these services through new technology-enabled channels that they are not familiar with. Even more so if basic services can be bought at third-party retail shops, where there is no direct representative of a bank or other institution with a fiduciary responsibility to the customer. However, consumer protection rules do sometimes have the effect of raising the cost of services (e.g. to pay for a call center that answers customers' queries or registers their complaints) and/or placing a higher burden on the customer in using them. Consumer protection rules need to balance protection against cost and ease of use, especially since the informal financial alternatives that people would use are devoid of pretty much any consumer protections.

There are also some longer-term issues that might arise once payment systems become more mature. It is not yet well understood how mobile money will impact the velocity of money (Mbiti and Weil)[19] and hence monetary policy. To the extent that shifts in velocity are predictable, monetary policies can be adjusted accordingly. But if mobile money leads to more erratic behavior of velocity, the effectiveness of monetary policy might be undermined.

**Additional Resources**

- Demombynes, G and A. Thegeya (2012), *Kenya's Mobile Revolution and the Promise of Mobile Savings*, The World Bank.
- Jack, W and T. Suri (2011), "Mobile Money: The Economics of M-PESA," NBER Working Paper No. 16721.
- Pickens, M, D. Porteous, and S. Rotman (2009), *Banking the Poor via G2P Payments*, CGAP.
- Orozco, M (2004), *The Remittance Marketplace: Prices, Policy and Financial Institutions*, Pew Research Hispanic Center.
- Porteous, D and J. Bezuidenhoudt (2008), *Managing the Risk of Mobile Banking Technologies*, Bankable Frontier Associates and FinMark Trust.

[18] Guadamillas, M. (2008), *Balancing Cooperation and Competition in Retail Payment Systems: Lessons from Latin America Case Studies*, The World Bank.

[19] Mbiti, I. and D. Weil (2011), "Mobile Banking: The Impact of M-Pesa in Kenya," NBER Working Papers 17129.