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The Regulation of Mobile Money in Rwanda

Jonathan Argent
James A. Hanson
Maria Paula Gomez

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Executive Summary

Mobile money has many potential benefits, particularly for the low-income and rural population. It offers safe storage, deposit, withdrawal and transfer of funds at lower cost and more convenience than banks; and facilitates domestic remittances at much low cost. Further capabilities are developing quickly – for example remote payments for services like electricity and batch payments of salaries for firms. This note reviews the regulation of mobile money in Rwanda — a key factor in the development of the mobile money industry — through the lens of international experience, giving some suggestions as to how Rwanda can build on the success it has achieved, moving towards greater financial inclusion at lower costs and risks. We argue that a *laissez-faire,* light handed regulatory approach is attractive in such a new, technology-based, capital intensive industry.

Interoperability is probably the most important regulatory issue currently being discussed. Interoperability between payment providers refers to the ability of participants to make payments across systems. There are two types of interoperability that are relevant here – interoperability between Mobile Network Operators (MNO) payment systems (e.g. payments from a MTN Mobile Money user to a Tigo Cash user), and interoperability between MNO payment systems and the banks (e.g. transfers from a Bank of Kigali account to an MTN Mobile Money account). While the latter has already developed in several countries (e.g. M-PESA in Kenya, Airtel in India), the former has never yet been achieved.

New regulation in Rwanda requires interoperability of all payment systems within one year – a very demanding target. In essence this requires either a new payment system, or one that runs parallel to the existing system. It is not clear that mobile money users have a strong demand for interoperability. Users can already operate across networks through the use of agents. Moreover, if the new system involves substantial fixed costs (which it probably does), MNOs will be forced to pass on these costs to consumers in the form of higher charges. These costs may curb the growth of the sector, since the low cost of the service is a major driver of its appeal. If it is possible to achieve interoperability in such a way that operators only face incremental costs on cross-network transfers (e.g. an external provider offers a cross-network transfer solution for a fee based on usage), this would run the least risk of increasing costs and slowing growth, but potential lack of demand may deter the external provider.

In moving towards interoperability, the signals sent to the MNOs are important. Mobile money is a relatively new market with an operating model that is neither stationary nor one-size-fits-all. The business requires significant investment and has long time horizons to break-even. For these reasons, the consensus within the literature is that regulation should aim to be 'light touch', giving the market a chance to mature. If operators feel that their interests are compromised by heavy-handed regulation, they are unlikely to commit the investment needed to achieve sustainable scale. The BNR has managed the market very well so far, but MNOs need to be carefully reassured that tough regulation on short notice is not going to stifle the market in future.

The quality of the agent network is broadly believed to be a key element in the success of mobile money services. MNO's invest heavily in recruiting, training, monitoring and disciplining agents. The BNR regulation does not permit exclusivity agreements with agents, which means that competitors may be able to gain advantage from others' investment in the agent network. This is a powerful disincentive for investment in a large, high quality agent network. Agent sharing is not common as yet in Rwanda, but in the case that it does become so, negative effects in agent investment will be important to watch. In addition, there may be complications relating to liability since the monitoring of the agent is not the responsibility of just one party and so there may be a need for guidelines and perhaps arbitration for dispute resolution.

Mobile money deposits are already operationally ring-fenced from the MNOs' accounts in Rwanda – the regulation requires that they are held in aggregate trust accounts in commercial banks. However, a legal framework to protect these deposits from the MNO (particularly in the case of bankruptcy) is not yet in place and would be desirable.

Customers of mobile money services do not face prudential risk from the MNO, but they are exposed to prudential risk from the bank into which the aggregate deposit is placed. The BNR has required that the MNO take out a deposit insurance policy for RWF200m for the aggregate deposit. This amount of deposit insurance is probably sufficient at this point, but may need to be reviewed in future as total deposits exceed this. Additional means of risk management include diversification of the aggregate deposit across banks or limits on the allowable use of the aggregate deposit (e.g. can only be invested in government bonds).

Current regulation requires that mobile money services meet minimum KYC rules, comply with the laws governing AML/CFT and report any suspicious activity to the BNR; good protection in combination with transaction size limits. However, the current transaction limits in the law (RWF500 000/day, RWF3m/month) do not apply to mobile money services (they apply only to money remittance services, the definition of which does not include mobile money); MNOs follow these limits by agreement. It would be preferable to amend the definitions to include mobile money services directly. These limits are not problematic for individual users, as they are generally far higher than the transaction needs of the poor in Rwanda, and more formal financial services are available for those who require more flexibility. Current regulation (that which applies to money remittance) also allows for higher-limit users (e.g. businesses paying salaries) subject to more bi-weekly reporting – a good compromise of control and flexibility.

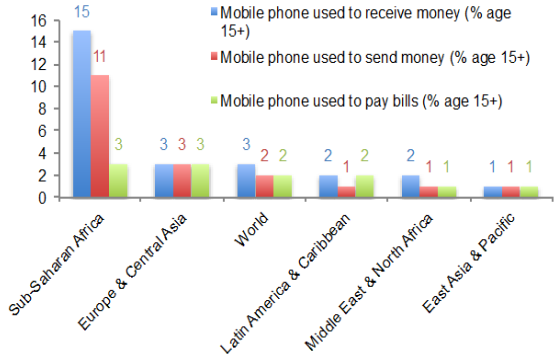
There is a need to look at how transaction limits will be applied to traditional banks in terms of their interconnection with mobile money services. Mobile money accounts are limited by transaction size, but traditional banks are not. If bank accounts and mobile money systems become interoperable, this will become an issue. Ideally payments originating in a bank and going to a mobile money account should be limited in the same way as the reverse. This issue is not mentioned in current regulations.

Contents

Background

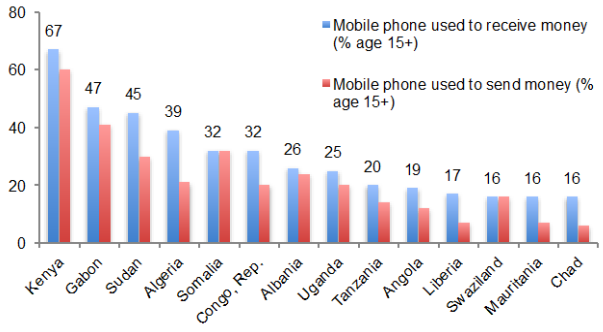
East African countries, particularly Kenya led by M-PESA, have been the most successful users of mobile money[1]. Mobile money began in the Philippines in 2001. According to GSMA[2] (2012), in December 2011 there were 129 mobile money operators in the world with more than 100 million subscribers. In a survey of 52 mobile money operators, (GSMA) found that there were 141.8 million transactions in June 2011, 80 percent of which occurred in East Africa, with Kenya alone accounting for 34 percent of transactions and 20 percent of the users. In 2011, 16 percent of adults report having used a mobile phone to transfer money *or* pay a bill in Sub-Saharan Africa, as compared to a global average of 5% (see Figure 1 for the split across type of usage).[3]

Figure 1. Use of mobile money in 2011 (% of population age 15+)



Source: World Bank, Global Findex 2011

Figure 2. Mobile money use - P2P transfers in 2011 (% of population age 15+)



Source: World Bank. Global Findex 2011

While Rwanda started later than the other partner states in the EAC, its growth has been impressive. Registered users reached around 1.2 million in 2012 (11.5 percent of the population), with close to 800 000 active in the month of October[4]. However, it is still small compared to the markets in other East African countries, particularly Kenya, where 67% of the population received transfers via mobile money in 2011 (see Figure 2).

[1] Note that mobile money is distinct from mobile banking. Mobile banking refers to the situation where an bank account holder is able to transact via commands from a mobile platform. Mobile money account holders do not require a bank account.

[2] Group Speciale Mobile Association

[3] These figures include mobile banking as all forms of electronic payments were recorded in the survey. (Demirguc-Kunt and Klapper, (2012a). This inclusion does not bias the large difference between Sub-Saharan Africa and other regions, as mobile banking is much more common in the other regions.

[4] Interview with John Bosco Sebabi, D.G. Operations, BNR on November 1, 2012.

The mobile money services that have been successful have varied substantially across markets. While Kenya has been the biggest success story in terms of overall usage, Somalia, Tajikistan and Albania lead on use of mobile money for bill payments. Kenya is not even in the top 5[5], despite its success in the use of mobile money for P2P transfers. Mbiti and Weil (2011) argue that the low usage of M-PESA to pay bills may be due to long processing times (it will take between one or two days to process) and high time discount rates. In Rwanda, payment of bills via mobile money is in its infancy with only prepaid electricity (Cash Power) currently in use.

Many authors have studied the characteristics that have led to Kenya's unparalleled success in the mobile money industry. The most cited determinants are the regulatory environment; the landscape of the mobile phone market; the level of financial inclusion (and existence of complement and substitute services); and, user perception and skills (see Heyer and Mas (2011), IFC (2010, 2011), CGAP(2012), and McKinsey (2012)). Additional to these, Heyer and Mas (2011) include the retail landscape. McKinsey (2012) add the importance of product design as well as the size and quality of the agent network. Appendix 1 presents a review of the literature regarding the importance of these factors. The case study in the box also provides an illustration of how these factors mattered in comparing the performance of the M-PESA mobile money system in Kenya and Tanzania.

The remainder of this report focuses on the role of regulation in mobile money and what Rwanda can learn from regional and international experience. We begin with an overview of the regulatory environment in East Africa and then go on to some more detailed comparative analysis of the specifics, focusing particularly on the issues of interoperability, regulation relating to agents and prudential regulation to manage risk.

Overview of mobile money regulation in East Africa

Kenya, Rwanda, Tanzania and Uganda all have a mobile money model led by MNOs. The operators are licensed by the Central Bank, for which they must pay a licensing fee and comply with reporting and regulatory requirements, including Anti-Money Laundering (AML), Combating the Finance of Terrorism (CFT) and Know Your Customer (KYC) regulations. All countries require the MNOs to maintain an aggregate deposit of the individual mobile money accounts in an escrow account in a commercial bank.

[5] Mbiti and Weil (2011) argue that the low usage of M-PESA to pay bills may be due to long processing times (it will take between one or two days to process) and high time discount rates.

Until recently, all four countries' mobile money systems have operated only domestic transfers. International transfer from mobile phones has not been allowed although in Kenya, Tanzania and Uganda, international transfers from Western Union can be *received* in mobile money accounts. However, starting October 2012, M-PESA customers in Kenya are able to transfer money directly to 35 countries through the international remittance hub HomeSend, which connects M-PESA with 21 international money transfer platforms (Mwakilishi, 2012).

In Rwanda, Tanzania, and Uganda, mobile money services are straightforward as are the regulations; in Kenya, a few more complex services have been developed. In Rwanda, Tanzania, and Uganda, MNOs' mobile money services basically relate to storage and transfer of funds as well as some basic bill-payment services (e.g. electricity). Transfers are usually the largest individual transactions (Davidson and Penicaud, 2011), and are an important benefit for the low-income and rural population. In Kenya, the same services are offered, but some other services have evolved including payments into bank accounts, withdrawals from ATMs, small loans and via partnership with Equity Bank, access to an interest bearing deposit account (M-KESHO). Across the EAC, but in Kenya in particular, the success of mobile money has been widely attributed to the light touch approach to regulation (IFC 2010, IFC 2011, Heyer and Mas 2011, Donovan 2012).

In none of the EAC countries is interest paid into individual mobile money accounts. Interest earned on the aggregate account is generally paid to the MNO. In Kenya initially, this interest had to go to charity, but recently, in the Draft E-Money Regulation (2011), the Central Bank has given MNOs discretion on how to use the resulting interest on overall account. While interest still cannot be paid into the users' mobile money accounts directly, it can benefit them indirectly through reduction in fees (Klein and Mayer, 2011). If this happens, it would benefit all users as opposed to individual interest payments which would be concentrated on richer users that are able to keep more money in the system. On the other hand, interest payments would encourage saving, another goal of interest to policy makers.

The total deposit in the mobile money system in Rwanda was $4.4m as at October 2012. If we assume that this is an average for the year and the MNO received an net annual interest rate of 5%[6], then the total interest for the year is $220 000 (as compared to $7.5m interest earned by Safaricom alone in 2011 (Klein and Mayer, 2011)). If this was to be paid to active mobile money accounts (just short of 800 000[7]), the average payment would be only $0.27 per account. While the question of whether it is preferable to allow individual interest payments is an interesting one, it is unlikely to have a large impact at this point.

[6] This is a high value given that the costs of deposit insurance is included in the agreement with the bank, and this is a current account that can be emptied without notice

[7] BNR data

Why did M-PESA fare so differently in Tanzania compared to Kenya?

- The launch of M-PESA in Kenya faced more **favourable competitive conditions**, allowing them to expand more easily (IFC, 2010). Safaricom launched the program two years before its competitors, with a cellular voice services market share of 80 percent. Vodacom had 41 percent of the mobile market, and had only 10 months of mobile money service before the entry of competition from Zantel. Additionally, at the time of the launch, mobile phone penetration was 30 percent in Kenya, compared to 20 percent in Tanzania.
- The **lower levels of education and financial literacy** in Tanzania were a challenge to launching a new technology. This problem exacerbated by two **strategic choices** made on the part of Vodacom. First, Vodacom chose to use a USSD service as opposed to the SIM Application Toolkit (STK) that was used in Kenya. The STK application is easier to maneuver, as the program can be directly installed in the SIM card while the USSD system requires users to follow a series of instruction for installation. Second, Vodacom did not invest a lot of resources in consumer education, while Safaricom did.
- **Vodacom Tanzania was not well prepared for the launch of M-PESA** in April 2008; it conducted little market research and rushed to launch the program before its competitors. Dissimilarities in population dispersion, crime rates, financial literacy and mobile penetration made the two markets very different. The anchor product that was so important in Kenya, "Send Money Home", was not appropriate for Tanzania, where the transfer of remittances across the country is not as widespread as in Kenya, something Vodacom only discovered subsequent to launch.
- Agent network: McKinsey (2012) argues that managing the agent network is one of the key success factors after a mobile money service has been launched. **Tanzania failed in comparison to Kenya in the three key aspects of managing agent networks**: (1) growing the customer base at the same time as the agent network, (2) understanding the agent economics and risks and (3) enrolling agents with the right skills. Differences in the population geography of Tanzania certainly complicated the task facing Vodacom, but they also invested less than Safaricom. An additional complication that slowed expansion in Tanzania was the lack of a national ID which created challenges for agents in fulfilling the KYC regulations.
- After the launch of Safaricom's M-PESA, **Vodafone Global Services (the owner of the M-PESA program) changed the business model** for future implementations of the service. In Tanzania they offered the service on a license fee model instead of the shared revenue model used in Kenya. This meant that Vodacom Tanzania had to pay a fee to Vodafone Global Services for each registered M-PESA customer. This business model led Vodacom Tanzania to purposefully control the growth in subscriptions by trying to limit registrations to active users, because Vodacom did not want to pay license fees for customers that would not transact over the Vodacom network.
- When Vodacom first launched the mobile money service it had **a complicated fee system** relative to the initial offering in Kenya. Fees were tiered for all transaction types, including person-to-person transfers to registered users, and cash withdrawals by registered users. The IFC (2010) argues that the fee structure was very confusing for new customers at the beginning.

Interoperability

Perhaps the most important regulatory issue relating to competition in mobile money is the *interoperability* of mobile money—the ability of the user of one mobile money service to transact directly with users on another system. There are two types of interoperability that are relevant here – interoperability *between MNO payment systems* (e.g. transfers from MTN Mobile Money to Tigo Cash), and interoperability *between MNO payment systems and banks* (e.g. transfers from a Bank of Kigali account to an MTN Mobile Money account). While the latter has already developed in several countries (e.g. M-PESA in Kenya, Airtel in India), the former has never, to the knowledge of the authors, been achieved.

The BNR has released new regulation that requires all payment providers (banks and MNO schemes) to be interoperable, by June 2013[8]. The regulations defines interoperability as "a set of arrangements, procedures and standards that allow participants in different payments schemes to conduct and settle payments across systems while continuing to operate also in their own respective systems"[9].

Effectively, interoperability between mobile money platforms is already possible, although it requires visiting an agent. For example, an MTN user can always send money to a Tigo user, but the receiver will have to visit an MTN agent to withdraw the cash and the charges are slightly higher. In addition, if he then wants to use that cash on the Tigo system, he will have to visit a Tigo agent to make the deposit – so getting cash from a deposit in one system to a deposit in another *requires visiting two agents*[10]. Interoperability between the Rwanda banking system and mobile money services is similarly available in a weak form – it requires a physical visit to a bank branch. The next step in interoperability would allow the remote payment from an account on one provider directly into the account of another via a command from a mobile phone or bank branch.

International experience with interoperability

To date, there is no directly comparable international experience on interoperability between mobile money operators to draw from. Moreover, forcing interoperability may slow the growth of existing mobile money companies and discourage new companies from entering, thereby reducing competition. Slow-downs in growth or non–entry by companies is an issue in smaller countries, where the number of mobile phone companies is limited by economies of scale.

[8] Article 21
[9] Section 16, Article 2
[10] In some cases, agents are operating for both MNOs, which would mean that only one location need be visited to accomplish this.

Some countries, such as Pakistan, have tried to encourage interoperability, but haven't mandated it directly (Heyer and Mas, 2011). Others, such as India, Nigeria and Liberia have required it; but the market and regulatory environment in these cases differ substantially and for all of them the mobile money market is relatively new and/or has not reached a large percentage of the population (penetration rates are below 20 percent of adult population, Demirguc-Kunt and Klapper (2012)). A brief overview of these country experiences follows:

- **In Nigeria, MNOs are not allowed to provide mobile money services – they must be provided by an independent organization (which can be bank) and must be operable on all MNO systems** (so the choice of mobile money is not affected by the MNO chosen by the user). Interoperability *with banks* is required by regulation, but there is no interoperability across mobile money services at present. Nigeria has the highest number of mobile money services in the world (16), but penetration is low (about 10% of the population (Demirguc-Kunt and Klapper (2012)) and prices are high (they range from 2% to 191% of the money transferred). Uzor (2012) attributes this to the complications relating to lack of MNO interest, challenges obtaining licenses and overcoming the technology constraints. The high prices likely play a significant role in the lack of penetration (Clifford, 2012a).

- **The Central Bank of India requires MNOs to partner with banks to offer mobile money services, which must be interoperable.** This amounts to mobile banking. However, some limited mobile money schemes (or "payment systems") have emerged without partnering with a bank. The Reserve Bank of India (RBI) does not allow these payment systems to provide cash-out services[11]. They offer only transfers to registered users, bill payments and merchant payment. To date, there are six mobile *payment* schemes in India and the penetration rate for these services is only about 4 percent of the population (Demirguc-Kunt and Klapper (2012b)). Partly this reflects the large number of bank branches in India. According to Nokia, who launched a mobile money service in 2010 and closed it in 2012, the lack of infrastructure was the biggest obstacle. According to Nidugondi (2012), the fact that telecoms have to partner with banks increases the amount of regulation mobile money services are subjected to and decreases the value of offering the services to poor and rural population.

- **The Central Bank of Liberia has required MNOs to partner with banks to offer mobile money services in Liberia.** Additionally, the Central Bank has required interoperability across all systems, a so-called "many-to-many model" (Central Bank of Liberia, 2011). These regulations were released in August 2011, and to date only a single service provider has been launched, by February 2012 it had 50,000 customers (All Africa, 2012). In essence,

[11] This means that it is not possible to convert the mobile money on your account into cash.

this regulation reduces mobile money to a mobile banking scheme, since a bank is always involved in providing the service and as such clearing of payments can go through the bank payment system.

None the examples discussed above are directly comparable to Rwanda due to the different model (either including banks, or excluding MNOs) but the low success rate so far with more heavy-handed regulation is cause for careful consideration. Interoperability may yet emerge naturally as the market grows or via technological innovation, and many feel it should only be required after the market has matured (Donovan 2012, IFC 2011, Davidson and Leishman 2011, CGAP 2012 and Clifford 2012a). The Reserve Bank of South Africa issued a circular in 2011 arguing that the South African mobile money market was not mature enough for interoperability, and thus that it would not yet be required (CGAP 2012). Similarly, the Central Bank of Kenya has been slow to move towards regulating interoperability, while indicating that it is a development they wish to see eventually (see Michaels (2011), Heyer and Mas (2011), UNCTAD (2012)).

We now turn to a more detailed discussion of how interoperability might affect the market in Rwanda.

The case for interoperability in Rwanda

The main theoretical benefits of interoperability are convenience for customers and more competition (Donovan 2012, Clifford 2012b, IFC 2011, CGAP 2012). Without interoperability, customers could face inconvenience and higher costs in transacting with users from the other networks. Lack of interoperability (or high fees for interoperability) could give rise to "network effects", where customers pick the network used by the majority of their peers, to minimize their costs[12]. Thus a network becomes increasingly attractive the larger it becomes. In Rwanda, MTN, by virtue of their larger customer base, has an advantage in the current system. Interoperability would reduce this advantage; though the extent of the reduction would depend on the fees for cross-network transfers on the interoperable system.

Interoperability is not free – there will be costs to the MNOs and banks to put the necessary systems in place. The structure of these costs and the related impact on competition will jointly determine how user fees are affected. It is certainly possible that the additional costs are passed on to consumers so that the net result is higher fees even in the case of increased competition (see Davidson and Leishman 2011, Donovan 2012, IFC 2011). The primary benefit of mobile money systems over traditional banking service relates to their low cost and high

[12] This is precisely what happens in the market for cellular voice services, where off-net calls are far more expensive than on-net calls (see Argent and Pogorelsky (2011)).

coverage – if these factors are compromised, it may slow the path to mobile money success, and ultimately financial inclusion.

The impact of forced interoperability will depend on the concomitant costs of the new system– the right cost structure is a key ingredient to a successful outcome. If a system was put in place by an external provider that offered cross-network transaction clearing at a flat fee (e.g. RWF5 levied on the originating financial service for every cross-network transfer made), this would risk little. This would allow the mobile money service or bank to pass on the cost of this service to those who use it, without increasing the fees for other services. However, if MNOs face significant fixed costs (i.e. fees that are not only incurred when a user makes a cross-network transfer), the result is likely to be higher fees *in general* for mobile money users. In this case interoperability is essentially imposing a charge on mobile money users that may not even want the cross-network transfer service.

Forcing full interoperability too quickly risks increasing costs, decreased investment and ultimately lower benefits in terms of financial inclusion. If the intention is to force full interoperability within a year, then the risks appear to be substantial. If no external payment provider is able to offer this service at a usage based payment structure, then the MNOs will be forced to take on significant fixed costs to achieve this, and the market is likely to suffer as a consequence. Regardless of the solution that is pursued, support and cooperation from all payment providers will be a precondition to successfully achieve interoperability.

Additional concerns relating to regulated interoperability

Regardless of the interoperability solution pursued, the type of settlement it uses will matter for the integrity of the financial system. Rwanda has already moved to real time gross settlement (RTGS) for high value payments, with the region as a whole moving towards an integrated RTGS system. If the new system for interoperable mobile money is a net settlement system and mobile money flows become sufficiently large, there could be complications where one party is unable to meet the settlement.

Interoperability may complicate settlement of complaints and fraud issues, as it may prove difficult to identify the responsible network. Prompt settlement of complaints is important in establishing the credibility of a network and depends on clear responsibility. In the current (closed) system, there is only one network that can be responsible in the case of a complaint, and MNOs have strong incentives to deal with these. In a system with interoperability, disputes relating to cross-network transfers may be challenging to deal with.

Interoperability may delay new entrants or extension of existing services because of the additional costs and complications for the MNOs. Interoperability involves more costs and

issues than mobile money transfers in a single company's network because it requires a banking-like payments system. In order to be interoperable, MNOs would have to invest in additional infrastructure and staff. This will complicate the entry of new operators and may delay the extension of current mobile money services while the operators deal with these challenges. If interoperability it pursued, putting in place mechanisms to smooth the way for new entrant will be important to avoid discouraging new entry.

Interoperability with banks is probably less important to regulate. These services have developed in some markets without regulation (e.g. Kenya), suggesting that it may be part of the natural process of the market maturing. In other countries, bill payment services like utilities are already available from MNO's – so MNOs are already able to provide a form of bank interoperability to businesses. Businesses can also set up their own mobile money accounts to receive payments, without the need for interoperability with banking. With exception of the smallest firms, businesses could also easily set up accounts on multiple networks if interoperability is not yet available (UNCTAD, 2012).

Applying interoperability in Rwanda should proceed with caution

In sum, theory and practice suggest that interoperability for mobile money should be approached carefully. Requiring interoperability while the Rwandan mobile money market is in its infancy, with the lowest penetration and highest fees in the EAC, involves significant risks. If well-orchestrated this could benefit the market; but adequate lead-time, support from industry players, and the right structure will be crucial to success. If these conditions are not met, Rwanda runs a chance of repeating the mistakes of other countries, with higher fees and slow growth.

Regulation of Mobile Money Agents

The quality of the agent network is one of the factors broadly believed to be a key element in the success of mobile money services[13]. MNOs invest heavily in recruiting, training, monitoring and disciplining agents. The regulations from the BNR state "Contracts with exclusivity are not permitted by this regulation unless they are authorized by the Central Bank"[14] (non-exclusivity has been regulated by the BNR since the beginning of mobile money systems in Rwanda).

A number of countries have regulated agent exclusivity. In Liberia, Nigeria and Tanzania, regulations stipulate that it is *allowed* for agents to serve multiple operators, but does not

[13] See appendix for detail
[14] Article 23.

require it. India however, has banned exclusivity agreements and there appear to be higher commissions for agents, and a smaller network. In Tanzania, where platforms are not interoperable, agents servicing several operators keep accounts with each mobile money service, diminishing the likelihood that an agent has sufficient e-float for a particular operator. It is difficult to draw clear inferences from these cases, as there are other potential explanatory factors for the relatively poor performance of the agent network (e.g. in Tanzania agents face onerous business licensing requirements (Heyer and Mas, 2011)); however, they do serve as a warning regarding the need for careful consideration of potential consequences.

The proponents of banning agent exclusivity generally appeal to increasing competition in a mature market. Michaels (2011) suggests that M-PESA holds a monopoly position through its dominance of potential agents. Competitors of Safaricom agree – for example, the Head of Orange Money Snehar Shah said in an interview: "we do not support any one player tying an agent on an exclusive basis, instead we are proponents of shared infrastructure". UNCTAD (2012) asserts that there are "not strong arguments against" non-exclusivity and note that it can aid in competition between MNOs and agents. On the other hand, those who argue against banning exclusivity, typically cite concerns about the *development* of the agent network (see Klein and Mayer 2011).

Theoretically, forcing agent non-exclusivity can create incentives that may increase the costs of building and maintaining a high quality agent network. If MNOs are denied exclusivity agreements, this means that the benefits of MNO investment in agent recruitment and training can now be enjoyed by their competitors. This creates powerful incentives against the kind of large scale investment in agent network that has been widely credited as being vital to the success of M-PESA in Kenya. Anecdotal evidence in Rwanda suggests that agent sharing has remained extremely limited so far, so this is perhaps better thought of as an issue to watch rather than one which requires immediate change.

To the extent that agents are shared among MNOs, there may be complications relating to liability in the case of fraud or misconduct, since the monitoring of the agent is no longer the responsibility of just one party. There may be a need for guidelines and perhaps arbitration for dispute resolution. While this does not seem to be a big issue at present (perhaps due to the very low lever of agent sharing), it may yet emerge as one in future.

Prudential regulatory issues in mobile money

Prudential regulations are aimed at dealing with risks to individual financial institutions and systemic financial risks. Within mobile money, there are few obvious risks that are not

associated with fraud, and they should be dealt with using criminal law. As mobile money systems only *store* money, rather than lending like a bank, the system cannot have a liquidity problem, save in the case of massive fraud. However, the banks and the banking system can generate risks to users of mobile money.

The fact that a large total deposit of all the mobile money users is placed in a commercial bank (or banks) means that the system depends on the quality of the bank. In Rwanda, MNOs are required to have deposit insurance of at least RWF200m to protect their aggregate deposits[15]. In the case where deposits exceed the total deposit insurance, then there may be an issue as to who would repay depositors in the case of a bank failure. While the regular prudential regulation of the bank does provide one line of defense here, a more direct solution would be to require MNOs to maintain deposit insurance up to the *total value of all deposits*. Alternatively, the BNR could place restrictions on what these deposits can be invested in by the bank (e.g. government debt) that is tied to the aggregate deposit. The BNR could also require MNOs to split their deposits across multiple banks to diversify bank risk.

If large enough, the mobile money system could affect the liquidity of the commercial bank. Given the current size of gross deposits and transfers, mobile money users are unlikely to start a run on the bank, though they might imitate withdrawals by other, market-sensitive depositors. Diversifying the deposit of the mobile money deposits across strong banks could reduce such risk. In Rwanda and Uganda, the MNOs deposit net mobile money in single banks; in Kenya and Tanzania the Central Bank requires deposits in different banks.

Mobile money deposits are already operationally ring-fenced from the MNOs accounts in Rwanda[16], but a legal framework to protect these deposits from bankruptcy of the MNO is not yet in place. The legal and accounting treatment should require that the overall deposit be protected both from the MNO and its creditors. Adequate financial controls and regular audit are important to enforce this.

At the micro level, mobile money does have the risk of agents' running out of cash, which is common complaint that is similar to an ATM running out of cash. Most mobile money agents store the cash they receive in safe locations, often in local bank branches. This means that they are susceptible of running out of cash if a large number of customers wish to make net withdraws from their deposits at the same time. However this is not an issue that requires prudential regulation – challenges with liquidity may be frustrating to customers (and hence

[15] Article 9
[16] See Section 12, Article 2.

MNOs have good incentives to deal with these[17]), but they do not threaten the stability of the financial system and as such this is not an area that requires regulation.

Regulations for AML/CFT

Current "Know your Customer" (KYC) and reporting requirements, combined with the limits on the size of mobile money transactions are a good, graduated-compromise solution for AML/CFT (Dittus and Klein, 2011). In Rwanda, MNOs are required to respect KYC rules prior to opening accounts[18] - in practice a national identification card is required to register for mobile money. Given the coverage of the Rwandan National ID system, this is probably fairly reliable without placing undue constraints on customers (as opposed to Tanzania where the lack of a National ID poses serious problems). In addition, MNOs are required[19] to report monthly to the BNR regarding suspicious transactions, in compliance with Article 20 of the Law on Prevention and Penalizing the Crime of Money Laundering and Financing Terrorism.

Current transaction limits are unlikely to be an obstacle to the use of the service, and should be maintained, providing a complement to AML/CFT as mentioned above (Dittus and Klein, 2011). The transaction limits currently in use were established by agreement when the BNR granted mobile money licenses, and are not specified in the law. The law specifies limits for "domestic remittances"[20], but this does not include mobile money operations[21]. Explicitly including the mobile money limit in the law would be an improvement in terms of transparency. Considering that most mobile money users in the region use these services for small transactions, they are unlikely to be a constraint for most mobile money users (the limit of RWF500 000 in Rwanda is greater than annual per capita GDP). For some (e.g. companies paying salaries), higher transaction limits are already applied, subject to reporting requirements to the BNR. The current system, made more transparent by legal amendment, is a good balance between financial control and flexibility and caution should be exercised in shifting these limits further upwards.

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[17] MTN Rwanda argues that the MTN agent network is now sufficiently dense to allow customers to go to another agent relatively easily in cases where one agent runs out of money (interview with Albert Kinuma, head of Mobile Money MTN, on September 13, 2012). In some countries, mobile money networks have created "super" or "aggregator" agents to ensure that standard mobile money agents are supplied with sufficient cash. Jack and Suri (2011) show that M-PESA was able to substantially reduce problems with agent liquidity in the space of just one year.

[18] Article 20

[19] Article 24

[20] Article 22

[21] Article 5 defines Money remittances as "…a payment service where funds are received from an originator without any accounts being created in the name of the originator or the beneficiary, for the sole purpose of transferring a corresponding amount to a beneficiary or to another Payment Services Provider acting on behalf of the beneficiary;" This clearly excludes mobile money services.

In the context of the requirement of interoperability between mobile money systems and banks, there is a need to consider how the size of payments from banks to mobile money accounts will be limited. The limits discussed above do not apply to banks and as such it would be possible to transfer much larger sums into mobile money accounts (e.g. a customer with Bank of Kigali could transfer a large amount into a mobile money account with MTN). A solution would be to apply the limits on mobile money accounts to *any transaction with the mobile money system*, which would then place symmetric limits on payments into the system from bank accounts.

A data protection policy is a required part of the MNO application for a license to operate a payment system; although the details of these are not public. Publishing the minimum requirements in terms of data protection, so that users are aware of how their personal data is used would be an improvement

Other issues in mobile money regulation

There are two issues relating to the regulation of mobile money that are likely to be important in the future, but have not yet emerged as such. In this section, we briefly outline the regulatory concerns related to monetary policy and international transfers of mobile money.

Implications of mobile money for monetary policy

Developments in the mobile money can affect the outstanding supply of money. To the extent that increases in mobile money balances represent a shift away from cash to deposits (as opposed to a shift from bank deposits to mobile money deposits, which seems unlikely), this will increase the monetary multiplier. Such changes in the deposits, which are likely to occur around holidays and harvests, could affect the outstanding supply of money. However, this kind of shift will be detectable within the banking system, since all mobile money deposits enter the a bank deposit via the MNO. Thus, this requires no special consideration for monetary policy.

It is possible that mobile money could lead to an increase in the velocity of money. If mobile money allows users to make transactions at a faster pace than usual, perhaps due to reducing the logistical constraints of distance (e.g. a farmer who would normally have to travel into the city to pay a supplier is now able to pay directly from his phone), then this could increase the velocity of money. Reporting of monthly transaction and deposits into mobile money is already required by the current legislation, so the information required to monitor this is already at the BNR's disposal.

More generally, trends in the development of mobile money may in future need to be included in estimates and forecasts of money growth and demand, and taken into account in monetary policy through the central bank's management of the money base. At this point however, is unlikely to affect total money or inflation directly, given its size. These issues were recently discussed by the Governor of the Central Bank of Kenya and the African Development Bank (AFDB 2012 and Ngigi 2012).

International money transfer

One of the frontier topics in mobile money is the emergence of cross-border interoperability to facilitate international remittances. To date such interoperability does not exist anywhere in the world, although M-PESA recently announced that it will soon offer a service of international transfers across its networks, through HomeSend, an international remittance hub. Rwanda receives US$ 76 million in remittances per year, a very large percentage of which accrues to services like Western Union that charge extremely high fees. The EAC with its increasing economic integration is well placed to tackle these challenges to further facilitate international remittances at low costs. However, the issues are not simple, involving limits on transactions, AML/CFT, and currency controls.

Conclusions

Rwanda has joined other East African countries in the dynamic mobile money industry. The low income and rural population can benefit substantially from the expansion of mobile money. Experience in East Africa and elsewhere suggests that mobile money can grow rapidly, especially if regulation is not excessive. The BNR has done an excellent job in regulating the market so far, but the way in which it manages the more complex issues of regulation emerging, most particularly those relating to interoperability, will be important for the development of the industry.

Regulation of mobile money, a new, technology-based, capital-intensive product is complicated; excessive regulation can stifle investment and innovation, and raise costs and fees for new products. Technological progress in a dynamic industry like this, as well as entry of new firms and alternate ways of providing services, can create competition and lower costs for the consumers over time, in ways that do not necessarily require regulation. At the same time, there are regulatory issues pertaining to consumer protection and risk, especially given the association of mobile money with the financial system. Regulation of mobile money needs to strike a delicate balance between allowing space for investment and innovation to flourish and concern for competition, financial risks and consumer protection.

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Appendix – a brief review of non-regulatory factors that have affected the growth of mobile money

Cellular market landscape

Not surprisingly, the cellular market landscape is a key determinant for the growth of mobile money schemes (Donovan (2012), IFC (2010 and 2011), Jack and Suri (2011) and Heyer and Mas (2011)). There are four factors typically considered as important: mobile phone penetration, the concentration of the market, pricing and user skills.

Mobile phone penetration determines the *potential* size of the mobile money market. Although mobile money can be used by those without mobile phones through the use of an agent, Suri and Jack (2009) found that not having a mobile phone is a major predictor of not using mobile money. In this sense, M-PESA had a clear advantage; in Kenya, in 2007 when M-PESA was launched, 30 percent of the population had a mobile phone, above 20 percent in Tanzania at the time mobile money services were first introduced. In 2012, the mobile penetration rate had increased to 74 percent of the population in Kenya, well above the penetration elsewhere in East Africa (see Table 1). Rwanda lags Kenya and Tanzania in terms of mobile money penetration, despite its relatively high mobile phone penetration (see Table 1).

Table 1. Mobile penetration and mobile money in EAC countries in 2012

Country	Mobile Penetration (% of population)*	Mobile money penetration (% of population)**	Number of mobile money providers***
Kenya	74	45	5
Rwanda	49	11.5	2
Tanzania	63	11.5	4
Uganda	51	7.7	4

* Data for Kenya, Rwanda and Tanzania is for June 2012 (CCK, RURA and TCRA). Data for Uganda is for December 2011, from the Ugandan Communications Commission (UCC) ** Source: CCK, , BNR, TCRA and CCU. *** Source: GSMA, Mobile Money for the Unbanked (2012).

A country with a large dominant network is likely to have more mobile money users than countries with similar level of mobile penetration and more even market shares. This is partly due to network effects – mobile money is more appealing the larger the number of people on a

network. Mobile money *can* be transferred manually from one network to another by withdrawing at one agent and re-depositing with another. However, this is time consuming and costly, as withdrawal fees are far higher than (internal) transfer fees.

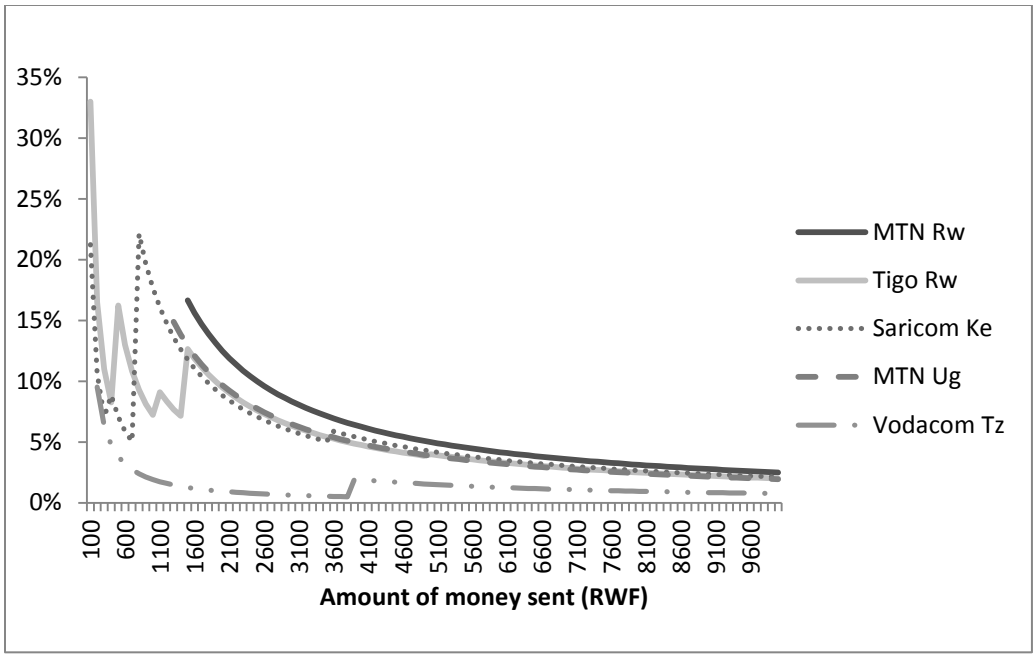
When Safaricom launched M-PESA in Kenya in March 2007, it had a market share of 80 percent in, active sim cards. Moreover, M-PESA was the only mobile money scheme in Kenya for about two years. None of the other mobile money schemes in East Africa had such an advantage when they launched their services. In Tanzania, for example, Vodacom was the first to launch a mobile money service in January 2008 with a market share of 41 percent in the mobile market. 10 months later, Zantel introduced its mobile money programZain (now Airtel Money) and Tigo quickly followed. Similarly, in Uganda, Airtel and MTN started their mobile money programs with a month difference, between February and March 2009. In these two countries, the mobile market remains less concentrated than in Kenya and Rwanda, possibly curtailing the growth of mobile money to some extent.

In Rwanda, MTN was authorized to provide mobile money services in February 2010, while Tigo started in May 2011, more than a year later. However, Tigo Cash's growth has been particularly fast, as today it is estimated that both MTN and Tigo have around 600,000 registered mobile money users each.[22]

All operators have similar pricing *structures* for the core product (deposit, transfer, withdrawal), irrespective of country location. Deposits are free, transfers are charged at a flat fee (or a small number of bands of flat fees), withdrawals at a much larger number of band-based fees, and withdrawals are generally much more expensive than transfers. Figure 4 shows the transfer fees (not inclusive of withdrawal charges) for the dominant operators in each country, plotting percentage cost against transfer value in RWF. Until recently, all operators had a single flat fee for transfers, but now as can be seen from the figure, Safaricom and Vodacom Tanzania have adopted bands of fees (i.e. flat fees are applied within bands of transaction size). In terms of prices levels, MTN Rwanda is most expensive for larger transactions, and Tigo Rwanda is the most expensive for small transfers– another factor explaining the slow penetration rate in Rwanda.

Figure 4. Fees by the size of the amount transferred in 2012

[22] Interview with John Bosco Sebabi, D.G. Operations, BNR on November 1, 2012.



Source: Websites for each of the operators, yahoo finance and authors' calculations.

Another aspect of the mobile phone market that matters for the adoption of mobile money is the familiarity of users with mobile data services and SMS. Kenya has higher literacy levels than the other EA countries[23]. Use of SMS is related to literacy levels and SMS pricing. Safaricom offers slightly lower prices than MTN Rwanda, MTN Uganda and Vodacom Tanzania (the largest mobile operator in each country). This is one of the areas where Rwanda is at a disadvantage with generally low levels of literacy and numeracy across the country.

Financial inclusion and existing money transfer alternatives

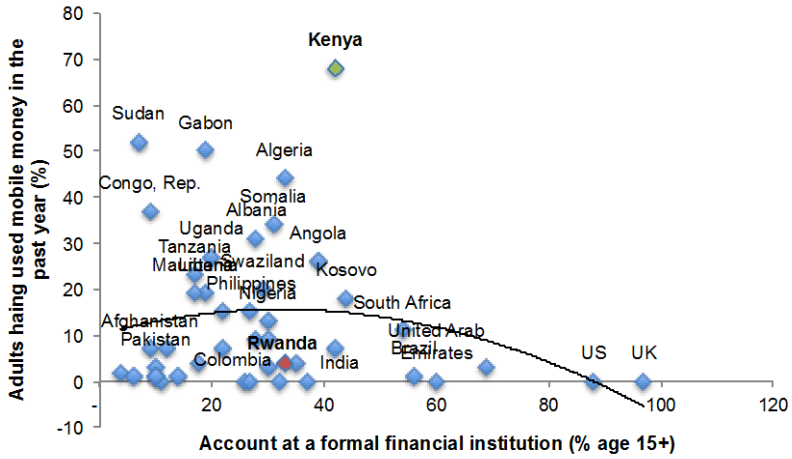
The level of financial inclusion and the existence of money transfer alternatives play a key role in the development of mobile money networks (e.g.IFC (2011) and Heyer and Mas (2011)). Alternative mechanisms can be both substitutes and complements to mobile money services; there is a particular stage of development of financial markets that fosters the growth of mobile money. Heyer and Mas (2011) claim that in an environment where there are too many alternatives to mobile money (as in developed countries), convincing costumers to switch mechanisms will be hard. On the other hand, in countries where there are no alternatives, it will be difficult for operators to educate customers on the use and importance of a new system.

[23] While in 2009, 87 percent of people 15 or above were literate in Kenya, the literacy rate was 73 percent in Tanzania and Uganda, and 71 percent in Rwanda (World Bank, World Development Indicators). Higher literacy rates are probably related to higher use of SMS and make it easier for mobile operators to educate consumers on the use of mobile money services.

The existence of alternative mechanisms may provide complementary services, as the partnerships between mobile money operators and Western Union and commercial banks show.

Mobile money has thrived in countries where there is a low to medium level of financial inclusion (IFC 2011, Heyer and Mas 2011). Figure 5 supports this story, where high use of mobile money is found in countries where between 10 to 50 percent of the adult population has an account with a formal financial institution. In the extreme, in countries like the United States and United Kingdom, where 88 percent and 97 percent of the adult population, respectively, have accounts in financial institutions, there is no use of mobile money. Because formal financial institutions offer a wide range of services (including very versatile mobile *banking* services) at very competitive prices, the value added of mobile money for individuals is close to zero. On the other extreme, countries with very low access to financial services have not developed mobile money services either (see for example Egypt, DRC, Madagascar and Togo), presumably because there is no understanding of the need and the operation of alternative payment systems, or because the countries lack the necessary infrastructure to implement the services (Heyer and Mas, 2011).

Figure 5. Relationship between mobile money use and access to the financial system



Source: World Bank, Global Findex 2011

Kenya has easily the highest level of development of financial services in East Africa (see Table 2). Kenya has the highest penetration of formal bank accounts, and highest bank branches and ATM's relative to population. While Rwanda actually has relatively high penetration of formal bank accounts and commercial bank branches, it lags severely in ATMs.

Table 2. Financial inclusion in EAC countries

Country	Account at a formal financial institution (% of age 15+)*	Commercial bank branches per 100,000 adults**	ATMs per 100,000 adults**
Kenya	42	4.4	7.3
Rwanda	33	2.2	0.8
Tanzania	17	1.8	3.3
Uganda	20	2.3	3.2

*Source: Global Findex Survey, World Bank, 2011. ** Source: World Bank, data for 2009.

Mbiti and Weil (2011) found that the relatively high availability of financial services in Kenya helped M-PESA grow its customer base and increase the number of active users. They found that males, urban residents, banked individuals, high income individuals, the better educated, and those employed in the non-farm sector were more likely to use M-PESA. Individuals with bank accounts used M-PESA almost three times as much as those without bank accounts. Moreover, 35 percent of banked individuals used M-PESA to save, while only 19 percent of the unbanked did. Godoy et al (2011) found similar results.

There are many alternatives available for the transfer of cash in developing countries. Money is transferred in cash by travelling long distances, sending it with friends or relatives, using formal transfer systems – such as services offered by Western Union – or semi-formal systems such as sending money with bus companies or using pawnshops. According to Heyer and Mas (2011), sending money with friends and relatives and the semi-formal services are the biggest competitor of mobile money services. In the Philippines for example, pawnshops are very common and frequently used to transfer money to relatives. In Tanzania[24] and Kenya, bus companies are often used. The degree to which these options are available, how safe, convenient and expensive they are will impact the success of mobile money.

Mbiti and Weil (2011) found that the introduction of M-PESA dramatically changed the way people transfer money in Kenya. In 2006, before M-PESA was launched, 50 percent of the

[24] In Tanzania, for example, bus companies charge a 10 percent commission for money transfers. Although it is not legal, Tanzanians often send airtime as remittances. Mobile phone agents charge commissions ranging from 15 to 25 percent for this service. Vodacom, charges between 0.8 and 9.5 percent for transfers, making mobile money a cheaper, faster and safer option to transfer money.

people surveyed by Mbiti and Weil (2011) sent money using friends and approximately 20 percent sent money using the post office. Formal methods, such as banks and money transfer companies were used less often (10 percent of respondents). Only two years after its launch, M-PESA had become the most common method to transfer money, with 50 percent of respondents sending money through M-PESA and 65 percent receiving money using this system. According to the authors, the introduction of M-PESA virtually eliminated the use of post office services, bus companies and formal transfer systems, as by 2010, only between 0.4 to 3.5 percent of individuals used these services. Sending money through friends remains a popular money transfer method in Kenya.

As in Tanzania, part of M-PESA's success in Kenya lies in its lower price relative to the alternatives (Morawczynski 2009). Before the introduction of M-PESA, the cost of sending money through formal channels ranged from US$ 12 (Moneygram) and US$ 20 (bank wire transfer), while the cost of slower channels such as bus companies and postal money order ranged from US$ 3 to US$ 6, respectively. M-PESA offered much lower prices – sending US$ 100 to a non-registered user was approximately US$ 2.5, while sending money to registered users was even cheaper (Mbiti and Weil, 2011). Moreover, Mbiti and Weil (2011) found evidence that suggests that the introduction of M-PESA led to a decrease in prices offered by Moneygram and Western Union. Additionally, the success of M-PESA led to former competitors, such as Western Union and commercial banks, to partner with M-PESA to offer new services, such as international remittances and access to the ATM network.

Business model

Finding the right mobile money business model is crucial to success (see Heyer and Mas (2011), IFC (2010) and McKinsey (2012)). McKinsey (2012) argues that many mobile money operators have made the mistake of copying the M-PESA model without conducting thorough market research, leading to slow growth of mobile money deployments in other countries (see Box 1 for the case of Tanzania).

Safaricom launched M-PESA with the slogan "Send money home" to capitalize on the extensive domestic remittance market, as 22 percent of Kenyans depend on domestic remittances as the main source of income. According to Heyer and Mas (2011), domestic remittances services are particularly important in countries where there is an ongoing process of urbanization and where the rural sector plays an important role in the economy. For example, in Kenya, Tanzania and Rwanda, urbanization rates are 23, 26 and 19 percent, respectively, compared to 49 in Philippines and 78 in Latin America. In countries with high urbanization levels, remittances often come from abroad.

M-PESA in Tanzania began growing at a faster rate once rural retailers registered for the mobile money program to send payments to urban wholesalers, contributing to a strong rural-urban flow. These payments became the base for an increased uptake of M-PESA in Tanzania (Heyer and Mas 2011 and IFC 2010). Similarly, informal sector employers in Kenya are increasingly using M-PESA to pay salaries.

In large countries, with scattered population, launching a nationwide domestic remittance program might be too difficult for smaller mobile operators. This was one of the problems Vodacom faced when it first launched M-PESA in Tanzania and has been a challenge for Indian mobile operators as well. Heyer and Mas (2011) suggest identifying domestic or international remittance *corridors*. Capitalizing on international remittance corridors represents an opportunity for Rwanda, considering the large flow of remittances coming from Uganda, Tanzania and Burundi (Godoy et al, 2012). In fact, MTN and Tigo could potentially link their networks in other countries to provide these services (as Safaricom's M-PESA is now doing – Business Daily Africa, 2012).

Rwanda's mobile money market is still young, and has not yet become clear what the right mix of services is for the market. MTN already offers batch payments for employers to pay their workers, and both operators facilitate payments for electricity. Doubtless, the potential uses of these services have only scratched the surface thus far.

The Agent Network

An important difference between mobile money and traditional banking services is the ability to reach the poorest members of the population, and those living in remote rural areas, at low cost. For a traditional commercial bank, building a branch in a remote area that will attract few customers who make frequent, but small transactions is not worth the investment. On the contrary, the investment needed for mobile money to reach these areas is much smaller, as in most cases it simply implies recruiting an additional agent, or training existing airtime sellers to provide mobile money services.

When Safaricom launched M-PESA in Kenya, it deployed 355 agents, and as the customer base grew, so did the agent network. 14 months after the launch, M-PESA had 3,000 agents, and today it has 27,988 agents in its network (IFC 2010 and Safaricom 2012). Moreover, Safaricom poured US$ 30 million into M-PESA, and invested most of it on recruiting and training agents, making sure they were easy to find, knew how to educate customers on the use of M-PESA and understood how to manage cash flows (McKinsey, 2012). On the other hand, Vodacom in Tanzania had difficulty expanding its agent network at the beginning, and 14 months after its launch it had only 930 agents (IFC 2010). The differences in the size and preparation of the

agent network played a crucial role in the uptake of mobile money services in these two countries (IFC 2010 and McKinsey 2012)

In Rwanda, MTN and Tigo have capitalized on the high density of population and the size of the country to build a strong network of agents. MTN increased its agent network from 200 agents to over 1,000, during the course of 2012[25].

[25] Interview with Albert Kinuma, Head of MTN Mobile Money, Rwanda.

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