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Policy Brief

A Randomized Impact Evaluation of the Introduction of Mobile Banking in Mozambique

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Key Message

The recent introduction of mobile banking services in rural areas of Mozambique created the opportunity to undertake a randomized impact evaluation of the introduction of this technology in rural and traditionally unbanked areas. Aware of the importance of urban-rural remittances to previous successful cases in similar contexts (namely M-PESA in Kenya), this project focuses on assessing the impact of the mobile banking technology on the level of urban-rural transfers within households and consequent household economic behaviour.

Motivation for Research

The use of cell phones has been dramatically changing the African landscape by making various types of information reach sections of the population that not long ago were completely isolated. Indeed, the take-up rate in this region increased by 550 percent in the five years up to 2009 (UNCTAD, 2009).

The well-known M-PESA case is a success example of how this widespread mobile technology can deliver essential goods (such as the provision of financial services) to isolated populations that would otherwise not have access to them. Despite the great success of the mobile payments experience in Kenya, the existing (mostly descriptive) evidence is only suggestive not only about the impact of mobile banking on household behavior, but even about the more basic features of supply and demand of mobile banking services, particularly in rural areas.

The expansion of mobile banking services to rural Mozambique that is currently taking place allowed us to design, in close coordination with the mobile service provider, a randomized impact evaluation of the provision of mobile banking services to rural households. Particularly, this project focuses on the role of urban-rural remittances for the success of mobile banking and devotes special attention to the motives for sending mobile remittances in detriment of other remittance channels - namely reduced remittance costs and increased trust in the mobile banking remittance channel. Lastly, this project will examine the consequences of these remittance flows in terms of household economic behavior.

Research Design

The first stage of the project's randomized intervention concerns the dissemination of the *mKesh* service in the rural communities. Extensive talks with the mobile banking service provider in Mozambique, *Carteira Móvel,* allowed the research team to randomly select the rural areas where this technology is being offered before the full roll-out of the mobile banking services to the whole country.

This dissemination is going to be conducted by randomly introducing and disseminating the mobile banking service in half of the sampled rural areas. This procedure yielded two different groups in our rural sample:

- **Group 0 (control group):** locations that are not subject to any intervention;
- **Group 1 (treatment group):** locations that are subject to the *mKesh* dissemination intervention.

The impact of the experimental intervention on our outcome variables of interest in the rural areas will be measured by comparing treatment and control areas.

A second stage of the experimental design has the objective of examining the role of lower remittance costs and increased confidence in the remittance channel on the success of mobile banking. For this purpose, urban migrants of the families interviewed in the rural locations are contacted, and these urban migrants are then the subject of a second (individual-level) randomized intervention:

- **Group A (control):** 1/3 of urban migrants constitute a control group that will be provided with specific information on how to register with and use the mobile banking service, namely how to send money to his/her family in the rural treatment locality;
- **Group B (treatment 1):** 1/3 of urban migrants are provided the same information as individuals in Group A, in addition they will also be offered a promotional 50% reduced transfer fee for 6 months;
- **Group C (treatment 2):** 1/3 of urban migrants receive the same information as individuals in Group A, in addition they are also offered a £1 voucher to experiment the service.

Comparing take-up and usage outcomes between group A and each of groups B and C allows distinguishing between the effect of a reduction in mobile banking remittance costs and the effect of an increase in trust and experience using mobile banking services (by dissipating any safety concerns through using the £1 voucher in this trial process). Contrasting the effects of strategies B and C provides a better understanding of the mechanisms underlying mobile banking adoption, namely of the relative importance of the remittance cost reduction and of the trust improvement motives.

A follow up survey to be done up to 12 months after the urban dissemination should allow measurement of the medium run impact of the experimental interventions.

Project Implementation

The project's main efforts are concentrated in the rural areas of Mozambique, where the large majority of the population has no easy access to traditional forms of banking and also where the mobile banking technology was still to be introduced before the start of this project.

Our sampling framework is based on the 2007 population census excluding census areas that: (i) are not covered by the mCel mobile phone network (information provided to us by our partner, *Carteira Movel*, under a confidentiality agreement); or (ii) are located in a district where there is no bank branch (information provided to us by the Central Bank of Mozambique).

At this point, using the above criteria and relying on the available data, the research team identified all eligible 174 localities according to the administrative division used in the 2007 Population Census and provided to us by the National Statistics Office (INE). Within each census locality we then randomly selected one enumeration area (EA), in order to ensure representativeness of rural areas in these provinces with mobile phone coverage and at least one bank branch in the district.

Having the sample already defined, the research team initiated, together with *Carteira Móvel,* the stage of identification of the future *mKesh* agents in the treatment areas. While travelling in the field, our team realized that several enumeration areas initially included in the sample actually did not have reliable network coverage and therefore these enumeration areas had to be excluded from the sample.

After visiting all the enumeration areas and ruling out those that did not comply with the required characteristics, the sample size was rescaled to 102 areas. As originally intended, in half of the sampled areas, the team recruited one *mKesh* agent and administrated this person a small individual questionnaire with questions on basic characteristics of the individual, his shop and community. These questionnaires present an important source of preliminary data.

Following on the *mKesh* agent recruitment phase, the research team initiated data collection for the baseline survey in the 102 treatment and control areas included in the sample.

The *mKesh* agent survey and the baseline survey present the two sources of data available to date, which allow us to draw the preliminary conclusions presented below.

Preliminary findings

Despite the preliminary nature of the data available at the current stage of research, we have reasons to be confident about the success of the implementation of the mobile banking system in rural Mozambique.

The data collected shows a high prevalence of households with a family member in Maputo city, which confirms the importance of the migration corridor from the southern provinces to the capital and of the remittance flows it generates. Furthermore, our data shows that the remittance channel most commonly used (bus drivers) is

expensive and not trusted by the remittance recipients in the rural areas, especially when compared with electronic bank transfers. Further inquiry also showed that the mobile phone company providing the mobile banking service is well known and trusted within the rural communities. Lastly, we observe high transportation and time costs faced by individuals in rural areas to travel to the nearest bank. This is associated with an insufficient supply of traditional banking services in these areas and translates into a very limited number of individuals who hold a bank account, within the studied areas. In order to magnify the potential impact of introducing the mobile banking on the number of rural households using formal savings, we conduct a small financial literacy intervention as part of the mobile banking dissemination. In this way the intervention design will simultaneously address what seems to be the two major barriers to formal savings: the high time and money costs associated to going to the nearest bank, since *mKesh* agents are placed inside the communities; and the lack of savings habits and knowledge, which will be improved by the financial literacy session.

Policy Implications

This impact evaluation study is of general interest to the Mozambican authorities, but of particular interest to the Central Bank of Mozambique, the regulator of the provision of mobile banking services in Mozambique.

At a broad level, the randomized impact evaluation methodology used in this project should provide the Central Bank with convincing evidence on the potential economic development and social benefits created by the mobile banking technology, as well as on adoption and usage patterns of mobile banking services using alternative dissemination strategies. These results would highlight the importance of drafting supportive regulation that enables the provision of quality mobile banking services within Mozambique.

The findings of this study could serve, in addition, to motivate the discussion and eventual creation of a legal framework to allow Mozambican emigrants in South Africa to send remittances via mobile banking to their families in Mozambique.

Even though remittances have been decreasing in importance as the number of migrants to South African mines falls, miner remittances are still a crucial inflow for external finance of Mozambique and historically they have also been an essential source of funding for agriculture and new business formation (cf. Castel-Branco, 2002). In addition to compulsory repatriation of 60% of the miners' earnings, evidence points to a large volume of voluntary remittances in addition to this compulsory deferred payment (cf. Crush).

In this context of large international remittances from South Africa to Mozambique, the potential magnification of the effects identified in our study by a policy allowing for international mobile banking could therefore be very important. This significant magnification of effects would happen not only because of the magnitude of the resources available to international migrants, which is much larger than that of the urban internal migrant transfers, but also because sending migrant remittances from South Africa to Mozambique is classified by the World bank as one of the most costly remittance corridors in the world (5th most expensive in the world, charging an average fee of nearly 20% or 38$ to remit 200$). In this context, introducing mobile banking with its reduced operating costs and low remittance fees should increase the potential for migrants to send even more voluntary remittances than previously estimated.

In addition, the largest part of the Mozambican population to whom remittances may be sent from either urban areas or from abroad lives in rural areas without access to traditional banks, even though much of this population has access to mobile phone technology. Hence the relevance of studying mobile banking activities that raise the opportunity of bringing important financial services to rural areas isolated from financial markets, in line with the Central Bank of Mozambique's declared priority of expanding the reach of financial services.

From our preliminary data, we observe that only 13 per cent of the rural households in the studied areas hold a bank account. In this context, we expect that the adoption of mobile banking will represent an initial step towards a more intensive use of traditional financial services, reducing in the medium-run the share of unbanked population in these rural areas.

First, our project will measure the extent to which an appropriate dissemination of the mobile banking services can promote financial literacy and an increase in the intensity of usage of financial services as sought by the Central Bank. And we should note that financial literacy in this context refers to the component provided by our intervention, but also resulting directly from usage of the *mKesh* service. Furthermore, the simultaneous combination of financial literacy and usage of mKesh should contribute to a part of the rural population eventually graduating into

the use of traditional banking services, as their confidence and needs grow, in terms of magnitude or complexity of operations in a direction that surpasses the offer provided by the mobile banking service.

In line with this idea, we believe that a successful uptake of *mKesh* will signal to the banks the existence of an unmet demand for financial services and should motivate new investments in these remote areas, which is especially important since long travel distances to the bank and associated money and time costs are reported to be an important obstacle to opening a bank account. Hence, in order to ensure the regular and expeditious use of financial services by the rural population, considerable investment is required on new infrastructures in areas currently not served by a traditional bank, as well as on additional equipment and staffing in places where bank agencies already operate.

A practical consequence of our work is related to the very limited network coverage encountered in rural areas. Facing these limitations in the field led to the realization that the information the network provider possesses on the extension and quality of their cell phone coverage throughout the country is highly inaccurate. After visiting approximately 174 rural communities, our field team was able to gather detailed information that may assist our partner cell phone company, mCel, in improving the coverage of their cell phone network. Since this is the country's largest cell phone network provider, we expect to contribute in this way to improve the overall cell phone coverage, at least in the areas of Mozambique where our project operates.

Beyond Central Bank objectives and regulation of the provision of mobile banking services, our results could also prove instrumental in designing rural development policies. This objective could be achieved in a context where the introduction of mobile banking services prompted an additional inflow of private migrant transfers to the rural economy, which could be channelled toward productive rural investment. This cold be facilitated not only because of the general availability of mobile costs and the fact that remittances would become very cheap and immediate, but also because these transactions could now remain confidential much more easily, which would be helpful for the recipients to avoid social pressure to spend on immediate consumption needs. In addition, it could also allow freeing public resources from traditional subsidization policies to other priority investments.

In summary, despite the early current stage of the project, it is already possible to identify preliminary policy contributions arising from this project. First, by following the implementation of the *mKesh* dissemination, it can potentially identify regulatory needs. Second, this work promotes financial literacy, both the component directly provided by our intervention, and also the learning resulting directly from usage of the *mKesh* service. This increased literacy should contribute to intensifying demand for traditional banking services, as is the objective of the Central Bank, which may promote additional investment by the traditional financial sector. Third, increased migrant transfers via mobile banking can generate new productive investment in rural areas that would otherwise not take place due not only to low remittance costs and immediate availability of the amount transferred, but also to the confidentiality of transfers that mobile banking allows. Finally, any effects identified by the project may be possibly magnified by allowing international mobile banking operations, namely between Mozambique and South Africa. The remittance flows that cross this border are very significant and could have a positive growth effect in Mozambique.

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