Transfers and Savings through Mobile Money:
Experimental Designs and Preliminary Results from Mozambique

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Motivation

- **Financial inclusion in Sub-Saharan Africa in 2011:**
  - Data from the Global Financial Inclusion (Global Findex) database show that 24% of adults in Sub-Saharan Africa had an account at a formal financial institution
    - The most frequently cited reason for not having a formal account is lack of enough money to use one; but cost, distance, and documentation requirements are cited by more than 30% of non-account-holders
  - Gallup reported that in 11 Sub-Saharan African countries, 32% of households received internal remittances (the majority of which were received through informal channels)
- **But the picture is changing, Global Findex, 2014, shows that:**
  - 34% of adults in Sub-Saharan Africa have an account
  - 12% have a mobile money account
  - 37% received internal remittances, 28% through m-money

- **Mobile money typically allows:**
  - Cashing-in money to a cell phone account (through a local agent)
  - Using e-money to transfer to any person through a cell phone
  - Paying for products or services
  - Buying airtime
  - Cashing-out e-money (from a local agent)

- **Mobile Money has been a huge success in recent years**
  - **In Kenya, M-PESA got 60% of the adult population conducting annual transactions worth 10% of GDP two years after inception in 2007**
- **In Ethiopia**
  - Ethiopia has no more than 1,500 ATM cash machines, just over 2,200 bank branches, or one for every 40,000 people. Only one in 10 adults have a bank account
  - Two mobile money platforms:

    M-Birr

    - Launched in 2013 as a pilot project
    - It is provided by the five main micro-finance institutions in Ethiopia (debit, credit and saving institutions in Tigray, Amhara, Oromia, Addis and the Omo microfinance institution)
    - In February had already 5,000 to 6,000 accounts

    helloCash

    - Just launched this year
    - It is provided by five private financial institutions in Ethiopia (Lion Bank, Bunna Bank, CBO, Wegagen Bank, and Somali MFI)

Literature on mobile money (M-PESA)

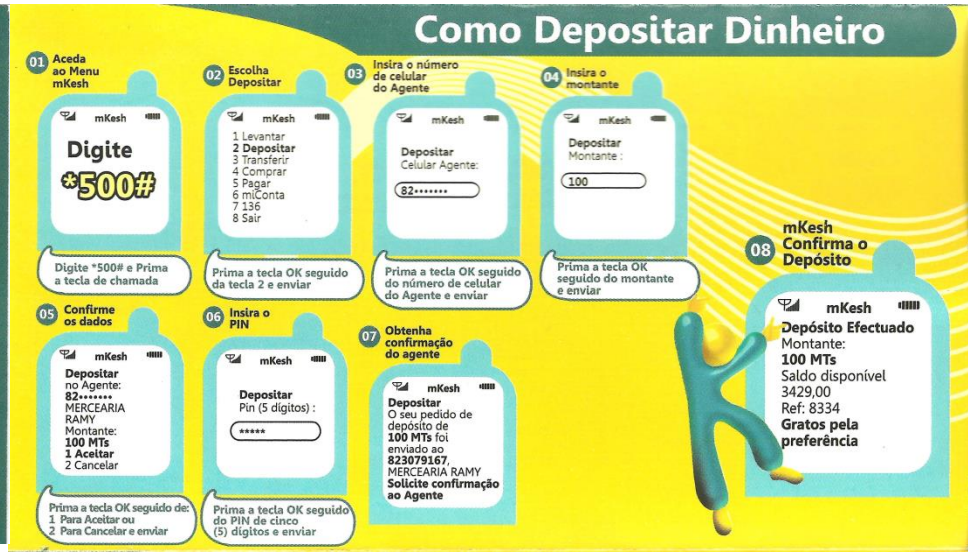
- **Jack and Suri (2011):**
  - While describing the M-PESA experience, raise a number of interesting potential economic effects of mobile money
    - M-PESA could affect the ability of individuals to share risk and to make more efficient investment decisions
    - By providing a safe storage mechanism, M-PESA could increase net household savings
- **Jack and Suri (2013):**
  - Does mobile money improve risk sharing?
    - Per capita consumption falls for a non-user household when they experience a negative income shock (7-10pp), as it does for households who lack good access to the agent network
    - M-PESA user households experience no such fall in per capita consumption
    - Users of M-PESA achieve some of these improvements in their ability to smooth risk via remittances: in face of a negative shock, user households are more likely to receive remittances (13pp more likely, equivalent to 6-10 percent of annual consumption)

Project 1: Introducing mobile money in rural Mozambique – impact on remittances and savings

- **Research questions:**
  - Economic impacts of access to mobile money:
    - Adoption pattern
    - Savings
    - Remittances
- **Methodology:**
  - Randomized field experiment
    - 102 locations in rural (Southern) Mozambique
    - 51 with newly-recruited mobile money agents, community-wide dissemination (popular theatres and community meetings), individual dissemination to a rural sample plus their corresponding migrants in Maputo
    - Started mid-2012
  - Measurement through administrative records and household surveys
    - Measurement until end of 2014, with 3 rounds of surveying

Agent recruitment

Community theatre and meeting



Some operations conducted as part of individual treatment: self-registration, cash-in, checking balance, buying from agent


Malawi
Niassa
Cabo Delgado
Nampula
Tete
Zambézia
Mozambique
Manica
Sofala
Bassas da India
Europa Islan
Inhambane
Gaza
Maputo
Swaziland
Geographic position of the sample across Mozambique
Legend:
Control Area
Treatment Area

- **Results (analysis is in progress):**
  - Take-up of mobile money – administrative data:
    - In the first year after intervention 66% of targeted individuals performed at least one transaction in the mobile money platform
    - Over the remaining time, overall percentage of users halved - with new payment services increasingly used
  - Transfers – survey data (2014):
    - 7% of total cash transfers received are made using mobile money; 12% of total cash transfers sent using mobile money
    - The probability of receiving remittances is higher by 6.3pp for the treatment group; there is a lower increase in the probability of sending remittances

- **Results:**
  - Savings – survey data (2014):
    - For those who use mobile money, 6.6% of total savings are kept in the mobile money service
    - Total savings of the treated individuals increase relative to the control (although non-statistically significant)
  - Risk-sharing – survey data (2014):
    - Aggregate consumption does not change significantly
    - Treated individuals significantly less vulnerable to lack of access to water, to hunger, and to lack of medical care

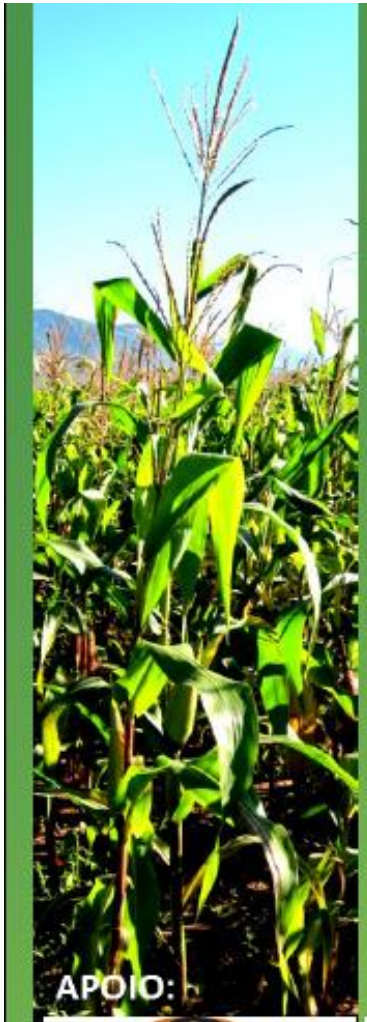
Table: Main outcomes

dependent variable ------>		whether received transfers	whether sent transfers	total savings	resilient to lack of access to water, food, medical care
		(1)	(2)	(3)	(4)
treatment	coefficient	**0.063***	**0.03**	**974.659**	**0.124***
	standard error	**(-0.037)**	**(-0.032)**	**-907.781**	**(-0.067)**
mean dependent variable (control)		0.497	0.303	3,917.31	2.497
R-squared adjusted		0.005	0.016	0.006	0.016
number of observations		1,330	1,330	1,245	1,330

Note: All regressions are OLS. All regressions include province dummies. Standard errors reported in parenthesis - these are clustered at the location level. * significant at 10%; ** significant at 5%; *** significant at 1%.

Project 2: Access to savings to incentivize fertilizer use for farmers in Mozambique

- **Research questions:**
  - What is the impact of access to savings accounts framed to invest in fertilizer for farmers in Manica Province in Mozambique?
    - On mobile money adoption
    - On savings
    - On investment in fertilizer
  - How does exposing social networks to treatment affect outcomes?
- **Methodology:**
  - Randomized field experiment conducted in 2013/2014
    - 196 maize farmers (each one identifying two closest farming friends)
    - 1/2 of the sample was given access to a savings account offering interest through mKesh; all farmers were given an introduction to mKesh and a module on fertilizer use; half of treatment and half of control had their friends treated as well
  - Measurement through administrative records and household surveys



BÓNUS-POUPANÇA PARA A SUA MACHAMBA!

AO GUARDAR DINHEIRO NA SUA CONTA mKesh RECEBE:

FERTILIZANTES PARA A PRÓXIMA CAMPANHA!

20 MTn EM Fertilizante POR CADA 100 MTn GUARDADOS NA SUA CONTA mKesh

*** Promoção válida por três meses a partir da data de entrega deste folheto.**
***O bónus é pago no final dos 3 meses em fertilizante para a sua machamba.**

APOIO:

NOVAFRICA
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- **Results (first paper draft complete):**
  - Access to the savings account:
    - Increased adoption of mobile money, the number of mobile money transactions, and total cash-ins
    - Non-frequent expenditures also increased as a result, but the likelihood that individuals lent money to their closest farming friends decreased
    - The probability of using fertilizer increased by 27-36pp at the 1 percent level of statistical significance

- **Results:**
  - Symmetric treatment of closest farming friends:
    - Increased the use of mobile money and savings with family and friends
    - It also reduced day-to-day expenditures and lending to farming friends
    - All these effects point to lower social pressure induced by the symmetric (network) treatment
  - Interaction between treatments:
    - Hints that the savings account enabled counteracting social pressure with regards savings

Table 2a: mKesh use - administrative data

dependent variable ------>		one transaction			number of transactions			total cash-in		
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
savings - β_S (H1a)	coefficient	0.131	0.131	0.169**	0.766**	0.727**	0.949**	61.402*	62.900*	80.233*
	standard error	(0.085)	(0.085)	(0.075)	(0.353)	(0.351)	(0.393)	(36.509)	(37.053)	(43.354)
network - β_N (H2a)	coefficient	0.049	0.094	0.148**	0.374	0.451	0.755**	8.586	0.508	12.302
	standard error	(0.057)	(0.069)	(0.066)	(0.245)	(0.314)	(0.369)	(11.738)	(9.664)	(14.211)
savings*network - β_{SN} (H3)	coefficient	-0.082	-0.092	-0.193*	-0.495	-0.783	-1.309**	-52.140	-62.022	-91.389*
	standard error	(0.099)	(0.124)	(0.114)	(0.422)	(0.485)	(0.594)	(37.280)	(39.142)	(50.152)
mean dep. variable (CI group)		0.106	0.106	0.109	0.277	0.277	0.283	10.638	10.638	10.870
$\beta_S + \beta_{SN} = 0$ (H1b)	F-stat p-value	0.281	0.626	0.774	0.331	0.887	0.420	0.271	0.944	0.486
$\beta_N + \beta_{SN} = 0$ (H2b)	F-stat p-value	0.654	0.986	0.570	0.776	0.358	0.140	0.227	0.101	0.064
r-squared adjusted		0.020	0.023	0.045	0.035	0.019	0.072	0.006	0.020	0.026
number of observations		340	191	186	340	191	186	340	191	186
treated network included in sample		yes	no	no	yes	no	no	yes	no	no
controls		no	no	yes	no	no	yes	no	no	yes

Note: All regressions are OLS. All dependent variables are based on transaction data made available by the mKesh operator for the period between the end of the survey team visits before planting season to the follow-up survey. All regressions include district dummies. Controls are gender, age, whether the individual was born in Manica province, whether the individual has completed primary school, number of household members, and number of children. Standard errors reported in parenthesis - these are clustered at the location level. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 6: Fertilizer use

dependent variable ------>		fertilizer use				urea use		npk use	
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
savings - β_S (H1a)	coefficient	0.265***	0.341***	0.311***	0.359***	0.236**	0.196**	0.012	0.025
	standard error	(0.093)	(0.094)	(0.095)	(0.096)	(0.096)	(0.096)	(0.073)	(0.079)
network - β_N (H2a)	coefficient	-0.122	-0.143	-0.143	-0.124	-0.175**	-0.187**	-0.062	-0.059
	standard error	(0.079)	(0.091)	(0.092)	(0.091)	(0.073)	(0.078)	(0.066)	(0.070)
savings*network - β_{SN} (H3)	coefficient	0.120	0.062	0.095	0.038	0.087	0.124	0.187	0.174
	standard error	(0.137)	(0.133)	(0.137)	(0.136)	(0.143)	(0.152)	(0.114)	(0.116)
mean dep. variable (CI group)		0.227	0.191	0.194	0.191	0.233	0.233	0.136	0.136
$\beta_S + \beta_{SN} = 0$ (H1b)	F-stat p-value	0.000	0.000	0.000	0.000	0.001	0.003	0.015	0.018
$\beta_N + \beta_{SN} = 0$ (H2b)	F-stat p-value	0.983	0.457	0.666	0.436	0.456	0.609	0.128	0.153
r-squared adjusted		0.139	0.171	0.167	0.238	0.120	0.116	0.024	0.029
number of observations		182	382	373	382	180	176	185	181
controls		yes	no	yes	no	no	yes	no	yes
difference-in-differences		no	yes	yes	yes	no	no	no	no
fixed effects		no	no	no	yes	no	no	no	no

Note: All regressions are OLS. All dependent variables are based on survey questions asked in the follow-up survey or both the follow-up and baseline surveys. All regressions without fixed effects include district dummies. Controls are gender, age, whether the individual was born in Manica province, whether the individual has completed primary school, number of household members, and number of children. Standard errors reported in parenthesis - these are clustered at the location level. * significant at 10%; ** significant at 5%; *** significant at 1%.

Project 3: Access to savings and financial literacy for urban microentrepreneurs in Mozambique

- **Research questions:**
  - What is the impact of access to formal savings through mobile money (offering interest) on microentrepreneurs savings, investment and growth?
  - What is the impact of a financial literacy module?
  - Are there complementarities between the two?
- **Methodology:**
  - Randomized field experiment
    - 1200 market vendors in the Maputo area
    - 400 with access to savings account on mKesh; 400 with financial literacy module; 400 with both; 400 control
  - Measurement through administrative records and firm surveys

- **Access to savings treatment:**
  - Information about mKesh, individual registration and testing (in line with what was done in the rural projects)
  - Payment of 5% of the average mKesh value kept in account each month, over several months
- **Financial literacy treatment:**
  - Financial literacy module, taught over weekly visits to microentrepreneur, based on manual
    - Simple accounting procedures
    - Separation of accounts
    - Business objectives
  - Logbooks distributed to microentrepreneur during the first visit
  - Comic strip distributed to microentrepreneur during the first visit

BÓNUS POUPANÇA

Pôr dinheiro no mKesh agora dá mais dinheiro!

Recebe 5 meticais por cada 100 meticais que conseguir **MANTER** na sua **CONTA MKESH** durante 1 mês!

Vamos dar-lhe este **BÓNUS** durante 3 meses!

***Os bónus são pagos em cada mês, mas pode existir um desfasamento de dias entre o final do mês e o pagamento do bónus.**

APOIO:

NOVAFRICA Nova Africa Center for Business and Economic Development

USAID FROM THE AMERICAN PEOPLE

IGC International Growth Centre

mcel

carteira móvel




Manual de Formação dos Micro-Empresários nos Mercados Urbanos DA CIDADE de Maputo

Logbook examples

Livro 3

Exemplo:

- No dia 30 de Março de 2012, o Senhor Ezequiel quer preencher a Folha 3 (folha de registo diário).
- Sabendo as compras, vendas e clientes a crédito do dia 30 de Março, registados na folha 1 e 2, e sabendo que o Senhor Ezequiel pôs 400 MTn no xitique, depositou 50 MTn na sua conta mKesh, e pagou as despesas de eletricidade em 700 MTn.
- Ainda mais, o Senhor Ezequiel emprestou 300 meticais ao amigo Joaquim, para este puder pagar as despesas da escola do filho.

Como é que o Senhor Ezequiel faz o registo ao final do dia?

Livro 3 – Registo ao final do dia

Data	Compras Valor Total – Custos Directos	Vendas Valor Total – Receitas – Pago	Vendas Valor Total – Receitas – Não Pago (a crédito)	Despesas com a loja (eletricidade, taxa de mercado,...)		Transferências/Empréstimos		Poupança		
				Valor	Descrição	Valor	Pessoa - Descrição	Xitique	mkesh	Banco
30/03/2012	10200 MTn	7000 MTn	500 MTn	700 MTn	Electricidade	300 MTn	Joaquim – escola do filho	400 MTn	50 MTn	-


Uma semana depois
Dona Joana: sabes, usei todo dinheiro de ontem para guevar e para o matabicho que tomamos na barraca da cunhada. Podes pagar o gay gay para mim? Nem sei o que vamos comer em casa se eu não vender hoje.
Comadre, aprendemos que não se usa o dinheiro do negócio para coisas de casa. Não devias ter usado o dinheiro de ontem para o matabicho. Se separares bem o dinheiro do negocio e dos gastos pessoais dificilmente terás falta de dinheiro para guevar ou mesmo para comprar comida.
Mercado grossista


Ahaaa… eu misturo tudo. O negócio é meu. Epah! Não vos conto, o dinheirinho que guardo na lata foi roubado. Só pode ser o bêbado do Sitoe. E emprestei ao meu irmão 1000,00mt para o funeral. Assim não tenho como guevar amanhã, alguém me tcheneca?
Se não queres cair e pedir esmola na rua é bom não emprestar mais dinheiro do negócio, nem mesmo para teus familiares, negócio é negócio não se mistura com coisa da casa. Outra coisa, enquanto guardares dinheiro o dinheiro em casa é mais fácil gastar Elisa, o dinheiro guarda-se numa conta poupança
MAPUTO
MNB 70-70

- **Preliminary results from midline (follow up will be conducted until the end of the year):**
  - Significant impacts on decreasing whether microentrepreneurs transferred to relatives and on increasing log total sales
    - Both mKesh savings account and financial literacy
    - Complementarities seem to exist between the two treatments
  - Unclear impacts on savings, expenditures, or the value of transfers to relatives

Table: Transfers and log sales

dependent variable ------>		whether entrepreneur transferred to relatives	log total sales
		(1)	(2)
mKesh	coefficient	-0.093**	0.394**
	standard error	(0.043)	(0.199)
Financial literacy	coefficient	-0.744*	0.349*
	standard error	(0.043)	(0.207)
mKesh*Financial literacy	coefficient	-0.137***	0.495**
	standard error	(0.042)	(0.213)
number of observations		1094	1028

Note: All regressions are OLS. All regressions include market dummies. Standard errors reported in parenthesis - these are clustered at the market level. * significant at 10%; ** significant at 5%; *** significant at 1%.

Other related smaller projects

- **Diffusion of mobile money:**
  - Lab-in-the-field experiment with 192 treated individuals from the rural project on the introduction of mKesh
    - Networks set-up exogenously; some individuals seeded with mKesh presents and the opportunity to give mKesh presents to other pre-determined individuals; several rounds follow
    - All managed through cell phone messages
    - Different treatments: we test the impact of anonymity, costs of sharing information, and the possibility of deception; we test versions of dictator, ultimatum, and reverse dictator games
    - Fieldwork just finished
- **Determinants of adoption of electronic means of payment for firms (work with the Bank of Mozambique):**
  - Survey of 1027 firms in Maputo and Matola conducted in 2014
    - Mobile money correlated with individual characteristics of owner; POSs correlated with business characteristics

Ways ahead and (tentative) policy implications

- Communication of mobile money services is of crucial importance
  - There is a sense that the existence of the technology/services is enough for adoption
  - But adoption is a function of investing in communication, and findings effective ways to communicate (rigorous testing is key)
  - Well-managed agents are key for this purpose
- Regulators are sometimes too conservative, namely regarding finding ways to offer interest-bearing accounts to mobile-money users
  - There is great potential in embedding services from fully-fledged banks and financial institutions in the mobile money platforms
- Remittances are the obvious channel of impact of mobile money (enormous decrease in transaction costs), namely through enlarging networks for insuring idiosyncratic risk
- But mobile money to incentivize savings should not be disregarded (for farmers or for urban vendors)
  - To counteract social pressure to share resources
  - Complementarities with financial literacy are likely