



## The Effect of Mobile Money on Saving and Money Transfer Practices for Low-Income Earners in Kenya

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### Abstract

*The mapping of the alternative value storage and saving methods is important in providing insights on the impacts of mobile money on saving practices, how people navigate their available payment choices now, and in what ways these practices are shifting. This study sought to find out whether the introduction of mobile money has been accompanied by a significant shift in saving and money transfer practices used by low-income earners in Kenya. The study surveyed 750 households across Kenya and found that the introduction of mobile money has been associated with an increase in the number of low-income earners saving their money with formal banks and saving and credit co-operatives and a significant shift away from the practice of saving money by hiding it houses. The practice of storing wealth in non-monetary forms was however unaffected by the introduction of mobile money in rural areas. Also, unaffected is the hawala type method of money transfer in rural areas of Northeastern Kenya. Other methods of money transfer experienced a significant decrease in usage amongst low income earners after the introduction of mobile money.*

*Key words: Mobile Money, Saving, Money transfer*

*JEL Classification: E22, G20, O16*

### Introduction

Mobile money transfer systems<sup>1</sup> that emerged in the year 2007 seem to have had a wider appeal to a wider population in Kenya than non-mobile money systems such as commercial banks Electronic Funds Transfer (EFT), Money Gram, and Western Union Money transfer which have been in existence for over 30 years. The growth of mobile money in Kenya has been phenomenal since its introduction. Data from the Communication Authority of Kenya (CAK) indicates that, mobile phone subscriptions increased from 37.7 million to 39.7 million during the period December 2015 to June 2016 a growth of 5%. Mobile phone penetration on the other hand grew by 3% over the same period to stand at 90%. During the same period, though mobile money subscriptions however declined by 1.5% to stand at 26.3 million, the number of mobile money transactions and value grew by 13% and 18% to stand at 375.8 million and Ksh 950 billion (USD 9.5 billion<sup>2</sup>) respectively (CAK, 2015; CAK, 2016).

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<sup>1</sup> Mobile money systems are defined as a service in which one can use to make and receive payments using a mobile phone GSMA, (2015)

<sup>2</sup> The exchange rate at the time of the study was 1USD: 101Ksh

This phenomenon has attracted interest from researchers who have studied various aspects of the mobile money systems. Mas & Radcliffe (2011) study the money transfer aspect of the mobile money system and note that M-Pesa one of the mobile money systems now handles more transactions domestically than Western Union does globally. This is a pointer to a shift in the means of transfer of money from non-mobile money systems to mobile money systems. Wausi, et al, (2013) and Muchai and Kimuyu (2016) investigate innovations the mobile money applications and conclude that Kenya has become a global hub for mobile money innovations. On the other hand, Haas, Plyler, & Nagarajan (2010) and Macharia & Okunoye (2013) show that mobile money systems have been adopted as money storage devices due to the increased security of funds they offer subscribers. Additionally, apart from serving as a money storage tool, mobile money systems have also been used as a saving vehicle especially amongst the poorest in Kenya and contributed significantly in enhancing financial inclusion to hitherto excluded sections of the population. This finding is corroborated by Mbiti, and Weil (2014), Muthiora (2015) in Kenya, Nandhi, (2012) in India, Severino, Tonderai and Life (2015) in Zimbabwe, Lal and Sachdev (2015) in several countries among a host of other individual country specific studies.

Another aspect that has received research attention is mobile money regulation and competition, (Kariuki, 2014; Michel and Chen, 2015; Marc, and Valletti, 2015; Adam, and Walker, 2015; Rafe and Rowan, 2016 and; Macmillan, 2016). A common finding among these studies is the need for interoperability of mobile accounts among the players in mobile money to promote competition and enhance innovation. The issue of a dominant player in the mobile money has also been argued to lead towards stifling the development of an ecosystem of financial services around mobile money. Consumer protection, transparency, ownership and use of data collected by Mobile Network Operators (MNOs) has also been discussed by Macmillan (2016). Katharine, Kaffenberger, and Zimmerman (2015) bring to the fore the issues of attendant risks in mobile money from a customer's perspective. Risks arising from their study include inability to transact due to network downtime, insufficient agent liquidity; user interfaces that many find complex and confusing; poor customer recourse; fraud that targets customers and inadequate data privacy and protection. Zimmerman and Baur (2016) investigate the same risks among the poor receiving digital social payments.

Jack, and Suri, (2011) investigate the macroeconomic impact of mobile money specifically focusing on m-pesa and identify several potential economic effects at the household level arising from for instance its impacts on saving and investment, to risk spreading and insurance, they also suggest potential impacts on the money supply and inflation. Adam, and Walker (2015), Aron (2015), and Muellbauer and Sebudde (2015) follow up on this issue of potential impacts of mobile money on monetary policy. Their findings suggest that mobile money may in fact lead to a reduction in the incompleteness of markets and a greater stability of the overall economy. They do not find evidence of a link between mobile money and food and non-food inflation as such concerns about velocity-linked inflation may be misplaced. Their results however suggest fiscal implications of mobile money due to its potential impact on tax revenue

One of the key gaps arising from the review of studies on mobile money is that these studies do not adequately address the social economic impacts of mobile money systems. As Donovan (2011) points out, because mobile money is a relatively new phenomenon, and since it has not been evaluated from a wide variety of approaches, the literature on mobile money tends to be descriptive and celebratory. This view is shared by Sunstein (2003) who notes that strong consensus only emerges from a diversity of views and approaches. Technological innovations have accompanying positive or negative social impacts and mobile money systems are not an exception. The mapping of the alternative value storage and saving methods is important in providing insights

on the impacts of mobile money on saving practices, how people navigate their available payment choices now, and in what ways these practices are shifting. This study sought to find out whether the introduction of money has been accompanied by a significant shift in saving and money transfer practices used by low-income<sup>3</sup> earners in Kenya. The study hypothesised as follows:

1. *There is no significant difference in the number of low-income earners using the different saving practices before and after the introduction of mobile money*
2. *There is no significant difference in the number of low-income earners using the different methods of money transfer before and after the introduction of mobile money.*

## **Methodology**

A survey was considered the most appropriate approach granted that the focus of the study was on mapping of the alternative value storage and saving methods their interaction with the mobile money systems and an exploration shifts in payment choices. For deeper insights on the key issues, the survey was supplemented with focus group discussions. The population of Kenya was estimated to be 47,251,447 in 2016 when the survey was carried out. The target population of the study comprised adult persons over 18 years of age (estimated to be 50.5% of the total population in Kenya) living below the poverty line (estimated to be approximately 33 %) as per the last poverty headcount carried out in the year 2006. The poverty line is defined by Kenya National Bureau of Statistics (KNBS, 2007) at Ksh 1,562 and 2,913 per month in rural and urban settings respectively which translates to Ksh 52 per day for rural adult persons, (adjusted for inflation this equals Ksh 69.15 or 0.7USD at current exchange rates of 1USD = 101KSh). The equivalent poverty line for (KSh 97.1) urban areas adjusted for inflation is Ksh 126.98 or USD 1.25. Mobile phone penetration, mobile network quality, literacy levels and a host of other factors differ between the two segments of the population (Michaels, 2011; CAK, 2016).

Due these and other unique social cultural characteristics in the different parts of the country, the population was stratified into urban and rural areas. Urban areas are defined as locations with more than 10,000 persons. Based on this definition, there are 101 urban locations in Kenya as per (KNBS, 2010). Following the approach suggested by UN (2005) for household surveys, the sample size determined to be 650 households but was adjusted upwards by 15% to 750 households to cover for non-responses. Granted that 68 percent of Kenyans live in urban areas while 32 percent of the population live in rural areas, using proportionate sample size allocation, 510 households were drawn from urban areas while 240 households came from rural areas. The households were drawn from 75 Locations of in 27 Sub-Counties of 10 randomly selected counties in Kenya. Data was collected using detailed questionnaires from April 25, to May 13, 2016 and while the focus group was conducted on September 13, 2016. To test our hypotheses, we conducted Chi Square tests.

## **Results**

### ***Description of respondents***

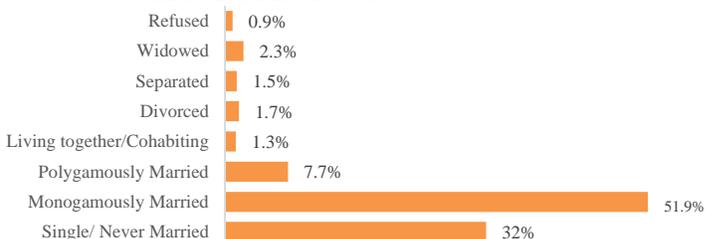
The representation of gender in the study sample was 48.8 percent males and 51.2 percent females. 24.8 percent of the respondents ages lay between 18 - 25 years, 35.7 percent between 26 - 35 years, 18.4 percent between 36 - 45 years, 10.6 percent between 46 - 55 years, while the rest were aged above 55 years. Married persons comprised 59.6 percent of the study sample, 7.7 percent of whom were polygamously married while 32 percent were not married, widowed persons

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<sup>3</sup> Low-income earners in this study are defined as persons living below the poverty line. The definition of persons living below the poverty line in Kenya is given in the methodology section of this paper.

on the other hand were 2.3 percent. As shown in chart 1, separated, divorced and cohabiting persons each comprised less than 2 percent each. 15.7 percent of the respondents had no formal education. As illustrated in chart 2, 68.6 percent of the respondent had some undergone level of basic education and 14.7 percent had tertiary education.

**Chart 1: Marital status**



**Chart 2: Highest education level attained**

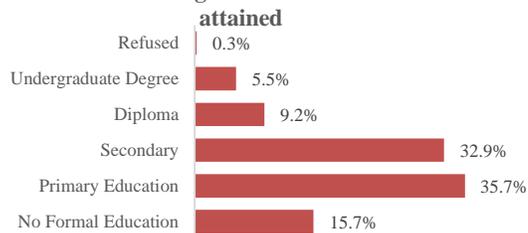
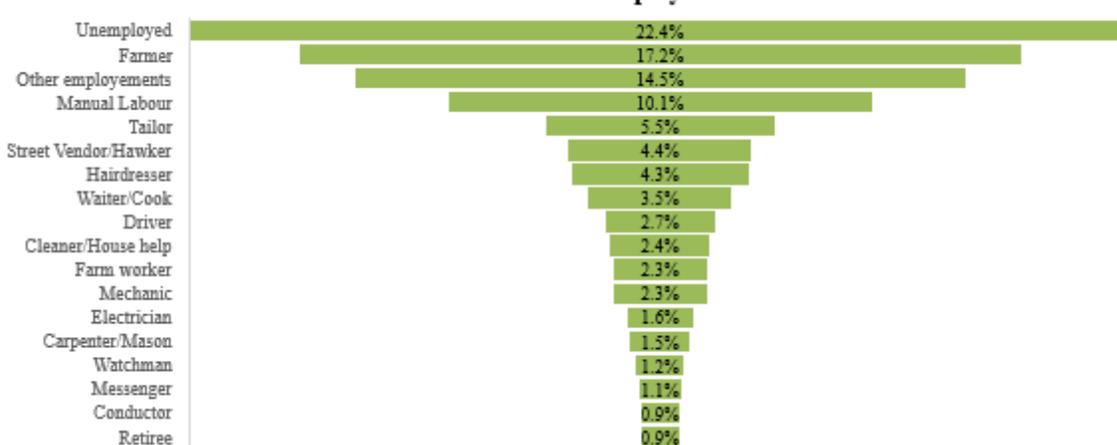


Chart 3 indicates the nature of employments of the respondents. Unemployed persons constituted 22.4 percent of the respondents, 54 percent of these unemployed persons, derived their subsistence from family members, 44 percent from occasional hired labour while 2 percent received support from government social protection remittances.

**Chart 3: Nature of employment**



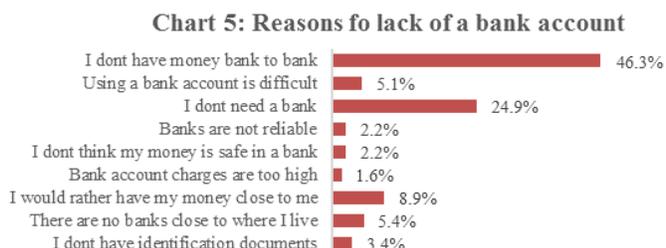
Mobile phone ownership amongst the respondents was 90 percent, 78 percent of the mobile phone owners had basic phones while 22 percent owned a smart phone. 66 percent of those without mobile phones accessed mobile phone services from relatives and 34 percent from friends or neighbors. Generally, 69 percent of all the respondents owned one sim card while 29 percent had two sim cards and three percent had 3 sim cards.

***Bank accounts ownership and usage***

Results indicate that only 39.6 percent of surveyed respondents owned a bank account. Males comprised 58.75 percent while females comprised 41.25 percent. When asked the reasons for opening a bank account, they gave varied reasons as shown in chart 4 below with majority indicating that they wanted to start saving. When the data was split based on rural/urban locations, the percentages of respondents that said the reasons given for opening a bank account was that they wanted to start saving were not significantly different to that of the full sample. However approximately a quarter of the low-income earners in rural locations indicated that they opened a bank account to receive money from another person as opposed to 10 percent of low-income

earners in urban areas. Those who said used a bank account in urban locations were 10 percent as opposed to 1 percent in the rural areas. When the data was split based on gender, the results were not significantly different from those of the full sample.

Our findings on the reasons given by those who did not have bank accounts were also varied as illustrated in chart 5. A majority indicated that they did not have money to bank. Surprisingly perhaps is the finding that almost a quarter of the surveyed respondents indicated that they did not need a bank account. When the data was split based on rural/urban locations the low-income earners who would rather have their money with them instead of a bank in rural locations were 15.7 percent as opposed to 6.6 percent in urban locations. The percentages of the other reasons given were not significantly different for low-income earners in rural or urban locations



The study's findings indicate that less than half of low-income earners did not consider bank accounts to be important to their finances since only 43 percent used their bank accounts frequently. As chart 6 shows, 13.6 percent of this income group opened bank accounts and never used it while 9.6 percent rarely used their bank accounts. When the data was split based on gender and then based on rural/urban location the results were not significantly different from those of the full sample.



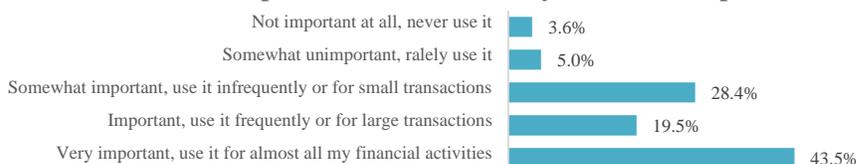
The study results show that 24 percent of low-income earners with bank accounts preferred accessing their money using their mobile phones, 27 percent preferred accessing their money over the counter at banking halls while 49 percent preferred using Automated Teller Machines (ATMs).

### ***Mobile money account and usage***

The study first sought to find out the level of awareness of mobile money services providers by the low-income earners. The level of awareness was generally high for this segment of the population at 99 percent for Mpesa, 72 percent for Airtel money, 57 percent for Orange money, 56 percent for Equitel money, 34 percent for Yucash, 26 percent for Mobicash and 11 percent for Tangaza money. Findings showed that 87.3 percent of all the surveyed respondents had registered with mobile money services provider(s), most of them were registered with Mpesa at 88 percent, Airtel at 6 percent, Equitel money which is the latest entrant at 5 percent, Tangaza money at 3 percent, Orange money at 1 percent and the rest at less than 1 percent.

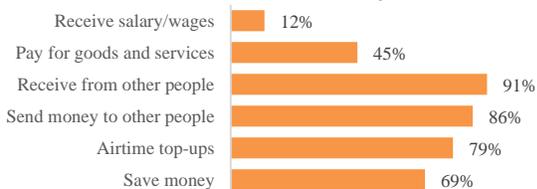
Asked about the importance of mobile money accounts to their finances 43.5 percent of the low-income earners with mobile money accounts considered it to be extremely important to their finances 19.5 percent considered mobile money accounts important and 28 percent considered the mobile money accounts as somewhat important. Chart 7 presents the results of the importance of mobile money accounts to low-income earner’s finances.

**Chart 7: Importance of mobile money account to respondent finances**

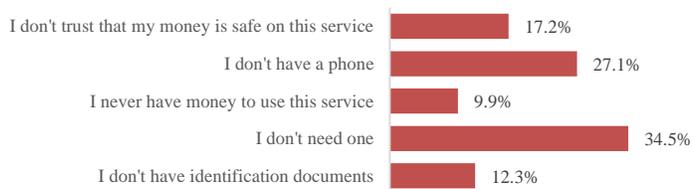


Results on the types of services accessed using mobile money accounts that are presented on chart 8 reveal that 91 and 86 percent use their mobile money account to receive and send money respectively, 79 percent use it for airtime top-ups and 69 percent use it to save money. Those without mobile money accounts gave varied reasons for not having such accounts. Generally, those without mobile money accounts accounted to 11.7 percent of all the surveyed low income earners. The reasons given by this group are presented in chart 9. Those in this group who felt they did not need a mobile money account amounted to 34.5 percent. Those who did not have mobile money accounts because of lacking mobile phones were 27.1 percent. Lack of identification documents which is a key requirement in the registration processes was cited as a reason by 12.3 percent of this group while 17.2 percent said they did not trust mobile money accounts.

**Chart 8: Uses of mobile money accounts**



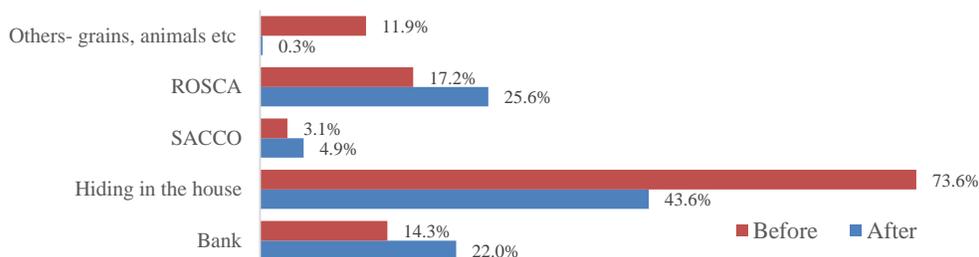
**Chart 9: Reasons for lack of mobile money account**



### ***The effect mobile money on savings practices***

The survey sought to find out how the advent of mobile money has affected the methods of saving money amongst low-income earners. Respondents were asked to list their saving practice(s) both prior to and after the advent of mobile money. The results presented in chart 10 shows the percentage use of the different practices of saving adopted the low income-earners both before and after the advent of mobile money. These results indicate that only two practices of savings have experienced a reduction in usage amongst low-income earners after the introduction of mobile money. The practice of saving money by hiding it in the house experienced a 30 percent reduction while other practice of saving such saving in form of grains, animals etc. experienced 11.6 percent reduction.

**Chart 10: Methods of saving before and after the advent of mobile money**



To answer the question whether the advent of mobile money was associated with shift in the saving practices, we conducted Chi Square tests to determine if significant differences existed in the number of low-income earners using the different methods of saving before and after the advent of mobile money. The Chi Square test results are presented in table 1. The findings suggest that there was a significant difference in the number of low-income earners using the different saving practices before and after the introduction of mobile money. Specifically, the advent of mobile money appears to have been associated with a significant difference (increased) in the number of low income earners saving their money with banks, SACCOs and ROSCAs and a significance difference (decreased) in the number of low-income earners saving their money by hiding it within their houses and those using non-monetary forms of savings.

When the data was split based in gender the results were all similar the full sample apart from the practice of saving money in non-monetary forms where the change in the number of low-income earners using this method of saving was not significant before and after the introduction of mobile money. When the data was partitioned based on location, that is urban versus rural, the change in number of low-income earners using non-monetary forms of saving in rural areas was found to be not significant. Perhaps, this is because this is a practice that is likely to be practiced in rural areas as opposed to urban areas

**Table 1: Chi Square test results for the test of number of users of the different methods of saving before and after the introduction of mobile money**

Partition	Money transfer method	Chi Square Test values
A: Full sample	Saving with bank	332.67***
	Saving money in the house	136.174***
	Saving with SACCOs	335.921***
	Saving with ROSCAs	328.259***
	Saving in non-monetary forms	16.694**
B: Male	Saving with bank	161.433***
	Saving money in the house	76.019***
	Saving with SACCOs	174.744***
	Saving with ROSCAs	141.489***
	Saving in non-monetary forms	15.227
C: Female	Saving with bank	150.998***
	Saving money in the house	70.203***
	Saving with SACCOs	125.405***
	Saving with ROSCAs	162.476***
	Saving in non-monetary forms	7.040*
D: Urban	Saving with bank	222.217***
	Saving money in the house	116.378***
	Saving with SACCOs	213.548***
	Saving with ROSCAs	200.649***
	Saving in non-monetary forms	448.000**

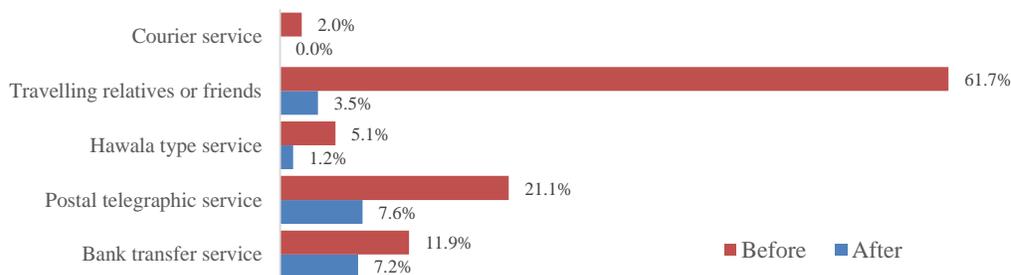
E: Rural	Saving with bank	110.468***
	Saving money in the house	36.725***
	Saving with SACCOs	181.353***
	Saving with ROSCAs	125.680***
	Saving in non-monetary forms	7.272

\*\* p < 0.05, \*\*\* p < 0.01

### *The effect of mobile money on methods of money transfer*

To find out the effect of the advent of mobile money on the different methods of money transfer, respondents were asked to list their method(s) of money transfer before and after the advent of mobile money. The results presented in chart 11 shows the percentage use of the different methods of money transfer that the surveyed low income-earners used both prior to and after the advent of mobile money. The results reveal that all the methods of money transfer experienced a reduction in usage amongst low-income earners after the introduction of mobile money. The practice of sending money through travelling relatives or friends experienced the highest percentage reduction at 58.2 percent while the practice of sending money through courier service experienced the lowest percentage reduction at 2 percent to be virtually non-existent amongst low-income earners after the introduction of mobile money.

**Chart 11: Methods of money transfer before and after the advent mobile money**



Chi Square tests were conducted to determine if there was a significant difference in the number of low-income earners using different methods of money transfer prior to and after the advent of mobile money to answer the question of whether advent mobile money was associated with a shift in the methods of money transfer. The results are presented in table 2 below. These results suggest that there was a significant difference (reduction) in the number of low-income earners using all the methods of money transfer after the introduction of mobile money.

When the data was partitioned based on gender the results were found to be similar with the full sample apart from the practice of sending money by courier where the change in the number of low-income earners using this method was found not to be significant for females. When the data was split along urban and rural low-income earners, the only difference from the full sample was in the hawala type money transfer service where the change in the number low-income persons using this method before and after the introduction of mobile money was not significant.

**Table 2: Chi Square test results for the test of number of users of the different methods of money transfer before and after the introduction of mobile money**

Panel	Money transfer method	Chi square value
A: Full sample	Bank transfer service	331.050***
	Postal telegraphic service	159.245***

	Hawala <sup>4</sup> type transfer	95.532***
	Travelling relatives of friends	187.120***
	Courier service	220.319***
<b>B: Male</b>	Bank transfer service	159.058***
	Postal telegraphic service	72.132***
	Hawala type transfer	92.160***
	Travelling relatives of friends	90.362***
	Courier service	190.464***
<b>C: Female</b>	Bank transfer service	158.453***
	Postal telegraphic service	91.397***
	Hawala type transfer	78.275**
	Travelling relatives of friends	96.380***
	Courier service	190.464
<b>D: Urban</b>	Bank transfer service	216.319***
	Postal telegraphic service	143.724***
	Hawala type transfer	91.743***
	Travelling relatives of friends	119.571***
	Courier service	155.378***
<b>E: Rural</b>	Bank transfer service	110.536***
	Postal telegraphic service	13.704***
	Hawala type transfer	27.328
	Travelling relatives of friends	91.551***
	Courier service	155.378***

\*\* p < 0.05, \*\*\* p < 0.01

## Conclusions

Our findings suggest that advent mobile money in Kenya has influenced the various saving practices among low-income earners in Kenya. First mobile money appears to have been associated with a significant shift from the practice of saving money by hiding it in houses. This finding is in line with Haas, Plyer & Nagarajan (2010) and Macharia & Okunoye (2013) that mobile money provides a safer saving alternative. The practice of saving money in non-monetary forms such as animals and grains however appears not to have been affected by the introduction of mobile money in the rural areas where it is normally practiced. This is a practice that is deeply rooted especially for pastoralists who store their wealth in animals. The introduction of mobile money on the other hand appears to have been associated with an increase in the number of low-income earners saving their money with formal banks and SACCOs. This suggests that mobile money is associated with an improvement in financial inclusion to hitherto financially excluded low-income earners. Mbiti & Weil (2014) and Mothiora (2015) arrive at similar findings. Our results also suggest mobile money has also been associated with an increase in the number of low-income earners saving with ROSCAs. It could be perhaps this increase coincided with the general appeal of ROSCAs in Kenya which has been on the rise in the last few years. However, the focus group discussion revealed that mobile money has facilitated the stability of ROSCAs where mobility due jobs or otherwise would have meant that members find it difficult to submit their regular savings, distance is not a hindrance any more.

Our results also suggest that introduction of mobile money has affected almost all the methods of money transfer among the low-income earners. The practice of sending is by courier is not practiced anymore by this segment of the population in Kenya. The only practice unaffected was that of sending money by hawala type method in the rural areas of Northeastern Kenya whose

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<sup>4</sup> Hawala is a system or agency for transferring money traditionally used in Muslim populations, whereby the money is paid to an agent who then instructs a remote associate to pay the final recipient.

usage was not significantly before and after the introduction mobile money. Perhaps this could be due that fact same communities may be found across the borders of Kenya and Somali and the fact that Kenya hosts the Dadaab refugee camp in this region.

## References

- Adam, C. S. and Walker, E. J. S. (2015). *Mobile Money and Monetary Policy in East African Countries*, University of Oxford. Available at: <http://www.sbs.ox.ac.uk/sites/default/files/research-projects/mobile-money/Monetary-policy-paper.pdf>. [Accessed December 29, 2016]
- Aron, J. (2015). “Leapfrogging: A Survey of the Nature and Economic Implications of Mobile Money”, Oxford Martin School. Available at: <http://www.sbs.ox.ac.uk/sites/default/files/research-projects/mobile-money/mobile-survey-leapfrogging-3.pdf>. [Accessed December 29, 2016]
- Aron, J., J. Muellbauer and Rachel Sebudde. (2015). “Inflation forecasting models for Uganda: is mobile money relevant? CSAE Working Paper, Centre for the Study of African Economies, Oxford. Available at: <http://econpapers.repec.org/paper/csawpaper/2015-17.htm> [Accessed December 29, 2016]
- Bourreau Marc, and Tommaso Valletti. (2015). *Enabling Digital Financial Inclusion through Improvements in Competition and Interoperability: What Works and What Doesn't?* CGD Policy Paper 065. Washington, D.C.: Center for Global Development. Available at: <http://www.cgdev.org/sites/default/files/CGD-Policy-Paper-65-Bourreau-Valletti-Mobile-Banking.pdf> [Accessed December 28, 2016]
- CAK. (2015). *Quarterly Sector Statistics Report, First Quarter of the Financial Year 2015/16*. Nairobi: Communication Authority of Kenya. Available at: [\[http://www.ca.go.ke/images/downloads/STATISTICS/Sector%20%20Statistics%20Report%20Q1%202015-16.pdf](http://www.ca.go.ke/images/downloads/STATISTICS/Sector%20%20Statistics%20Report%20Q1%202015-16.pdf) Accessed December 22, 2016]
- CAK. (2016). *Quarterly Sector Statistics Report, Fourth Quarter of the Financial Year 2015/16*. Nairobi: Communication Authority of Kenya. Available at: <http://www.ca.go.ke/images/downloads/STATISTICS/SECTOR%20STATISTICS%20REPORT%20Q4%202015-2016.pdf> [Accessed December 22, 2016]
- Demombynes, G., & Thegeya, A. (2012). *Kenya's Mobile Revolution and the Promise of Mobile Savings*. Nairobi: World Bank. Available at: <http://documents.worldbank.org/curated/en/900911468047101453/pdf/WPS5988.pdf> [Accessed June 7, 2015]
- Diniz, E. H., Albuquerque, J. P., & Cernev, A. K. (2011). *Mobile Money and Payment: A literature review based on academic and practitioner-oriented publications (2001-2011)*. *SIG GlobDev Fourth Annual Workshop*. Shanghai, China December 03, 2011: SIG GlobDev. Available at: from <http://www.globdev.org/?q=node/110> [Accessed on July 15, 2015]
- Donovan, K. (2011). *Mobile Money in the Developing World: The impact of M-Pesa on Development Freedom and Domination*. Thesis, Georgetown University, Edmund A. Walsh School of Foreign Service, Georgetown. Available at: [http://blurringborders.com/wp-content/uploads/2011/06/Donovan\\_MPESA\\_Thesis\\_Prepublication.pdf](http://blurringborders.com/wp-content/uploads/2011/06/Donovan_MPESA_Thesis_Prepublication.pdf) [Accessed December 26, 2016]
- Duncombe, R., & Boateng, R. (2009). *Mobile Phones and Financial Services in Developing Countries: a review of concepts, methods, issues, evidence and future research directions*. *Third World Quarterly*, 30(7), 1237-1258. Available at: <http://www.tandfonline.com/doi/abs/10.1080/01436590903134882> [Accessed December 29, 2016]

- GSMA (2015). State of the Industry Report: Mobile Money (online) London: GSMA. Available at [http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2016/04/SOTIR\\_2015.pdf](http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2016/04/SOTIR_2015.pdf) [Accessed 1 December, 2015]
- Haas, S., Plyler, M., & Nagarajan, G. (2010). *Outreach of M-PESA System in Kenya: Emerging Trends*. Washington, DC: IRIS and Microfinance Opportunities. Available at: <https://www.microfinancegateway.org/sites/default/files/mfg-en-case-study-outreach-of-m-pesa-system-in-kenya-emerging-trends-jun-2010.pdf> [Accessed December 31, 2016]
- Hanouch Michel and Gregory Chen. (2015). Promoting Competition in Mobile Payments: The Role of USSD.” Brief. Washington, D.C.: CGAP, February. Available at: <http://www.cgap.org/sites/default/files/Brief-The-Role-of-USSD-Feb-2015.pdf> [Accessed December 22, 2016]
- Hughes, N., & Lonie, S. (2007). M-PESA: Mobile Money for the “Unbanked” Turning Cellphones into 24-Hour Tellers in Kenya. *Innovations: Technology, Governance, Globalisation*, 2, 63-81. Available at: <http://www.mitpressjournals.org/doi/abs/10.1162/itgg.2007.2.1-2.63> [Accessed December 23, 2016]
- Jack, W. and T. Suri, (2011), “Mobile Money: The Economics of M-PESA”, National Bureau of Economic Research, 1050 Massachusetts Avenue, Cambridge, MA 02138, NBER Working Paper Series, Working Paper 16721. Available at: <http://www.nber.org/papers/w16721> Accessed on [Accessed December 22, 2016]
- Kish, L. (1949). A Procedure for Objective Respondent Selection within the Household. *Journal of the American Statistical Association*, 44(247), 380–387. Available at: <http://amstat.tandfonline.com/doi/abs/10.1080/01621459.1949.10483314> [Accessed June 13, 2015]
- KNBS. (2007). *Basic Report on Well-Being in Kenya*. Nairobi: Kenya National Bureau of Statistics. Available at: <http://www.knbs.or.ke> [Accessed December 22, 2016]
- KNBS. (2010). *Kenya 2009 Population and Housing Census Report*. Nairobi: Kenya National Bureau of Statistics. Available at: [http://www.knbs.or.ke/index.php?option=com\\_phocadownload&view=category&id=99&Itemid=639](http://www.knbs.or.ke/index.php?option=com_phocadownload&view=category&id=99&Itemid=639) [Accessed June 17, 2015]
- Kusimba, S., Chaggar, H., Gross, E., & Kunyu, G. (2013). *Social Networks of Mobile Money in Kenya*. California: Institute for Money, Technology & Financial Inclusion. Available at: [http://www.imtfi.uci.edu/files/2013-1\\_kusimba\\_1.pdf](http://www.imtfi.uci.edu/files/2013-1_kusimba_1.pdf) [Accessed June 15, 2015]
- Macharia, J., & Okunoye, A. (2013). Mobile Banking Influence on Wealth Creation for the Unbanked. *International Conference on ICT for Africa 2013*. Harare. Available at: [http://erepo.usiu.ac.ke/bitstream/handle/11732/783/Paper%20Template%20of%20WJMS%20\(Use%20%E2%80%9CTitle%20of%20Paper%E2%80%9D%20style\).pdf?sequence=4&isAllowed=y](http://erepo.usiu.ac.ke/bitstream/handle/11732/783/Paper%20Template%20of%20WJMS%20(Use%20%E2%80%9CTitle%20of%20Paper%E2%80%9D%20style).pdf?sequence=4&isAllowed=y) [Accessed December 22, 2016]
- Macmillan, R. (2016). Digital Financial Services: Regulating for Financial Inclusion, An ICT perspective. GDDFI Discussion paper. Available at: [https://www.itu.int/en/ITU-D/Conferences/GSR/Documents/GSR2016/Digital\\_financial\\_inclusion\\_GDDFI.pdf](https://www.itu.int/en/ITU-D/Conferences/GSR/Documents/GSR2016/Digital_financial_inclusion_GDDFI.pdf) [Accessed December 29, 2016]
- Mas, I., & Radcliffe, D. (2011). Mobile Payments Go Viral: M-Pesa in Kenya. *The Carpco Institute's Journal of Financial Transformation*, 32, 169-181. Available at: [http://siteresources.worldbank.org/AFRICAEXT/Resources/258643-1271798012256/M-PESA\\_Kenya.pdf](http://siteresources.worldbank.org/AFRICAEXT/Resources/258643-1271798012256/M-PESA_Kenya.pdf) [Accessed June 17, 2016]
- Mavhiki Severino, Nyamwanza Tonderai and Shumba Life (2015) Impact of mobile banking on traditional banking Practices in Zimbabwe. *International Journal of Economics, Commerce and Management* Vol III No. 1. Available at: <http://ijecm.co.uk/wp-content/uploads/2015/01/3129.pdf> [Accessed December 31, 2016]

- Mazer, Rafe and Philip Rowan. (2016). Competition in Mobile Financial Services: Lessons from Kenya and Tanzania (Washington, D.C.: CGAP). Available at: <http://www.cgap.org/sites/default/files/Working-Paper-Competition-in-MFS-Kenya-Tanzania-Jan-2016.pdf> [Accessed December 22, 2016]
- Mbele, Lerato. (2016). “Why M-Pesa failed in South Africa” BBC Africa Business Report Johannesburg. Available at: <http://www.bbc.com/news/world-africa-36260348> [Accessed December 29, 2016]
- Mbiti, I & Weil, D.N. (2014), Mobile Banking: The Impact of MPesa in Kenya. NBER Working Paper No. 17129. Available at: <http://www.nber.org/chapters/c13367.pdf> [Accessed December 22, 2016]
- McKee, Katharine, Michelle Kaffenberger, and Jamie M. Zimmerman. 2015. “Doing Digital Finance Right: The Case for Stronger Mitigation on Customer Risks.” Focus Note 103. Washington, D.C.: CGAP. Available at: <https://www.cgap.org/sites/default/files/Focus-Note-Doing-Digital-Finance-Right-Jun-2015.pdf> [Accessed December 27, 2016]
- Michaels, L. (2011). *Better than cash: Kenya mobile money market assessment*. United States Agency for International Development. New York: USAID. Available at: [http://pdf.usaid.gov/pdf\\_docs/PBAAC032.pdf](http://pdf.usaid.gov/pdf_docs/PBAAC032.pdf) [Accessed June 23, 2015]
- Muchai, Dianah Ngui and Peter Kimuyu (2016) “ICT Enabled Services: The Case of Mobile Money Transfer in Kenya” WIDER Working Paper Helsinki: UNU-WIDER (forthcoming). Available at: <https://www.wider.unu.edu/sites/default/files/Blog/PDF/Dianah%20Ngui%20Muchai.pdf>. [Accessed December 28, 2016]
- Muthiora, B. (2015), Enabling Mobile Money Policies in Kenya Fostering a Digital Financial Revolution. Mobile for Development Impact. Available at: [https://www.itu.int/en/ITU-T/focusgroups/dfs/Documents/2015\\_MMU\\_Enabling-Mobile-Money-Policies-in-Kenya.pdf](https://www.itu.int/en/ITU-T/focusgroups/dfs/Documents/2015_MMU_Enabling-Mobile-Money-Policies-in-Kenya.pdf). [Accessed December 22, 2016]
- Nandhi, M.A. (2012). “Effects of Mobile Banking on the savings practices of low income users. The Indian Experience. Institute of Money, Technology and Financial Inclusion”. Working Paper 2012-7. Available at: [http://www.imtfin.uci.edu/files/blog\\_working\\_papers/2012-7\\_nandhi.pdf](http://www.imtfin.uci.edu/files/blog_working_papers/2012-7_nandhi.pdf). [Accessed December June 27, 2016]
- Ngugi, B., Pelowski, M., & Ogembo, J. (2010). M-Pesa: A Case Study of the Critical Early Adopters’ Role In The Rapid Adoption of Mobile Money Banking in Kenya. *The Electronic Journal on Information Systems in Developing Countries*, 43(3), 1-16. Available at: <http://www.ejisdc.org/ojs2/index.php/ejisdc/article/view/713>. [Accessed June 22, 2015]
- Nyaga, J. Kariuki. (2014). Mobile Banking Services in the East African Community (EAC): Challenges to the Existing Legislative and Regulatory Frameworks. *Journal of Information Policy*, Vol. 4, pp. 270-95. Available at: <http://www.jstor.org/stable/10.5325/jinfopoli.4.2014.0270> [Accessed December 26, 2016]
- Rajiv Lal and Ishan Sachdev (2015). Mobile Money Services - Design and Development for Financial Inclusion. Harvard Business School Working Paper No. 15-083. Available at: [http://www.hbs.edu/faculty/Publication%20Files/15-083\\_e7db671b-12b2-47e7-9692-31808ee92bf1.pdf](http://www.hbs.edu/faculty/Publication%20Files/15-083_e7db671b-12b2-47e7-9692-31808ee92bf1.pdf) [Accessed on December 31, 2016]
- Sunstein, C. R. (2003). *Why Societies Need Dissent*. Cambridge MA, USA: Harvard University Press. Available at: <http://www.hup.harvard.edu/catalog.php?isbn=9780674017689> [Accessed June 10, 2015]
- UN. (2005). *Designing Household Survey Samples: Practical Guidelines*. New York: United Nations. Available at: [http://unstats.un.org/unsd/demographic/sources/surveys/Handbook23\\_June05.pdf](http://unstats.un.org/unsd/demographic/sources/surveys/Handbook23_June05.pdf) [Accessed June 11, 2015]

- Wausi, A., Mgendi, R. and Ngwenyi, R. (2013). Labour Market Analysis and Business Process Outsourcing in Kenya: Poverty Reduction through Information and Digital Employment Initiative, Research Report 2013 No. 3 August 2013. Available at: [http://sds.ukzn.ac.za/files/ITEM1-researchpaper\\_KENYA\\_Aug\\_FINAL.pdf](http://sds.ukzn.ac.za/files/ITEM1-researchpaper_KENYA_Aug_FINAL.pdf) [Accessed December 12, 2016]
- Zimmerman, Jamie M. and Silvia Baur (2016). Understanding How Consumer Risks in Digital Social Payments Can Erode Their Financial Inclusion Potential. CGAP Brief (Washington, D.C.: CGAP) Available at: <https://www.cgap.org/sites/default/files/Brief-Understanding-How-Consumer%20Risks-in%20Digital-Social-Payments-March-2016.pdf>[Accessed December 2, 2016]