FULL COLOUR THINKING

GRADUATE SCHOOL OF BUSINESS
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# Savings and Shock-Coping Behavior in South Africa's Metropolitan Townships



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Maurizio Santamicone

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Supervised by: Jean-Paul Van Belle

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*"I certify that the content of this paper is my own and original work; and that all sources have been accurately reported and acknowledged. This document has not previously been submitted in its entirety or in part at any educational establishment."*

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# Abstract

In this paper we study savings behavior in South African Metropolitan Townships and households' ability to manage "shocks" ex-post to their occurrence. In particular we want to determine if the availability of instruments like mobile-money solutions, that allow households to save anywhere , anytime, next to community savings schemes like *stokvels* and more traditional ones like funeral plans, insurance and bank accounts affects the savings behavior to the extent of improving households' shock-coping strategies. We investigated how variables like education level achieved, employment status and approach to life of the respondents influence their behavior.

Poor people periodically face a variety of "shocks", events that can be overwhelming, like ill-health or death of a family member (sometimes the breadwinner), or natural disasters causing loss of home or crop. By providing them with means to save anywhere, anytime they have a chance to mitigate shocks by saving over time, enabling them increase their productivity, maintain their expenditure on nutrition and education during hard times and preventing them from falling back into poverty.

While many scholars argue that poor people do have surplus money to save, and the data from this research confirms this statement, traditional financial institutions, especially large commercial banks, find it hard to reach these customers as it is too costly to establish branches in remote areas and they do not have business models to deal with a large number of customers that require low savings and small transactions. Instead mobile operators have experience and technology in place in handling low-value, high-volume transactions and can therefore run the payment and account management platforms instead (or on behalf of) banks.

We interviewed 528 households in the Metropolitan Township of Khayelitsha, Cape Town and found statistical evidence that employment status, education level and approach to life affect savings behavior and the adoption of an "optimal" vs. "sub-optimal" strategy when facing unexpected events or shocks. Usage of mobile-money products is low as only 15% of the sample declared to use any of them: this can be partially explained by the fact that bank penetration in the Metropolitan Townships is surprisingly high, with 80% of the population

formally banked as confirmed by other studies. We did not find enough statistical evidence that savings through mobile-money instruments improves shock-coping behavior although all the respondents who use some mobile-money product indicated that they perceive an improvement in their ability to deal with unexpected events. We found statistical evidence that education level, employment status and approach to life affects savings behavior and the financial situation of the household. Correlation tests showed statistically significant relationships between better strategies and employment status or education level. Respondents who save using use methods that do not allow immediate withdrawals of the funds like stokvels or funeral plans adopt better strategies than those who rely only on bank accounts.

# 1. Introduction

Microcredit has been celebrated since the 1990s by policy makers, practitioners and the academia for its success into lifting individuals and sometimes communities out of poverty. Some recent events like credit bubbles in Andra Pradesh (India), Bosnia and Pakistan have however casted doubt towards excessively aggressive lending policies that resulted in overborrowing by poor customers (Marinangeli & Presbitero, 2011). In particular the Indian experience has received attention for the Reserve Bank of India policy of not allowing microfinance institutions (MFIs) to collect savings, raising the risk of clients defaults and MFIs collapse (Hulme & Thankom, 2011).

Scholars' attention has recently been focusing towards the importance of savings. "Helping people save their way out of poverty can be much cheaper and less risky than helping people borrow their way out of poverty. Borrowing has its place, but now is the time to focus on saving" (Karlan, 2010). Savings give people the ability to turn irregular cash flows into lump sums for larger purchases, emergencies and investments. In absence of "safety nets" like health insurance and social security, saving can be the only way for the poor's welfare.

As (Banerjee & Duflo, 2007) explain, poor people do have surplus money to save. Even people living on less than $1 per day spend money on many nonessential items or so-called

"temptation goods" like alcohol, tobacco and televisions. And when they increase their earnings, they spend only two-thirds of their windfall on foods. They instead spend a greater share of their income on temptation goods. As the income goes up, they tend to indulge on pricier goods, as the wealthier do. But as they give in to temptation, the poor pay a greater share of their income compared to the wealthier.

(Goss, Mas, Radcliffe, & Stark, 2011) argue that a daily wage earner could set aside funds every day to ensure her family consumption for days when she can't find work. A farmer can save funds when they come plenty in the harvest season in order to be able to buy very important commodities like seeds and fertilizer later on, thereby ensuring next season's income. More in general, a poor family can use savings accounts to build a reserve of funds to use later on in case of an health emergency, job loss or crop failure.

(Christen & Mas, 2009) argue that microfinance organizations are starting to realize that when an effort is made to serving low-income families, they can mobilize relatively large numbers of depositors therefore funding a significant portion of their lending portfolios. They cite success stories including BRI in Indonesia, BAAC in Thailand, credit unions in West Africa, Opportunity Bank in Malawi, Procredit Bank in the Democratic Republic of Congo, all contributing to reinforce the idea that deposit mobilization is a viable service for the poor.

In two recent field studies, (Dupas & Robinson, 2008) show evidence that access to a savings account can generate significant welfare effects on poor households, as in the case of poor farmers who can purchase fertilizers when they need it thanks to appropriate savings mechanisms.

Access to a basic bank account, however, remains limited in most of the developing world, and especially Africa (FinMark Trust, 2009). In particular, less than one in five people have access to a formal bank account, and more than half do not participate to any kind of organized form of savings. Informal community-based structures have provided financial support among communities through savings-led groups (SLGs) where group members contribute savings to a pooled account used to lend to individual members. The most interesting part of the survey shows however very recent developments that are happening in some countries: the emergence of mobile money schemes.

Mobile operators are capable today of taking people's cash in amounts as low as 20 US cents using thousands of retail outlets and converting it into airtime value that is storable and transferrable. So, as (Goss, Mas, Radcliffe, & Stark, 2011) explain, the logic behind these schemes is simple: why can't they leverage on this capacity to allow customers to store and use that value for any purpose?

The purpose of this research is to investigate the impact of instruments like mobile-money solutions that allow semi-urban South Africans to save anywhere, anytime on the ability of households to manage shocks ex-post to their occurrence. We will also consider other instruments popular among these communities like *stokvels* next to more traditional ones like bank accounts and funeral plans.

In particular, we want to answer the following research questions:

*Does access to and take-up of mobile money savings instruments allow households to adopt better responses to adverse shocks?*

*Does utilization of community-based savings schemes like stokvels allows households to adopt better responses to adverse shocks?*

*Does utilization of insurance and funeral plans allow households to adopt better responses to adverse shocks?*

*Does the shock-coping behavior vary by the employment level?*

*Does the shock-coping behavior vary with the educational level?*

*Does the shock-coping behavior vary by approach to life?*

The following section will discuss some background around this research, in particular microfinance and microsavings, what do we mean by "shocks", how poor people cope and what do we mean by "optimal" vs. "sub-optimal" coping strategies. We will investigate what do they look for in savings products and why traditional financial institutions are not successfully reaching to them, generating a need for new banking models for the poor. Then we will describe the rise of mobile money schemes and the opportunities they offer to "fill

the gap" in the banking system. In section 3 we will review a literature of recent field experiments and surveys that investigate the impact of improved access to microsavings accounts, generally offered by MFIs, on savings behavior of the affected communities. In the experiments access to microsavings accounts has been improved though information campaigns, by lowering information and other barriers to access, or intervening on other type of barriers like account-opening and maintenance fees. The last three surveys are related to mobile money adoption in Kenya and South Africa, and investigate the relationship between mobile money uptake and savings behavior.

Section 4 explains the methodology we will use in the proposed research, including research approach, strategy and design. We will outline the data collection method we propose, budget and time considerations, sampling, and metric used to evaluate savings behavior.

Section 5 will present our data analysis: descriptive statistics of the sample, cellphone usage, savings behavior and shock-coping behavior. The analysis is centered around three core "themes", in particular how approach to life, educational level and employment status affect savings behavior and shock-coping behavior. Section 6 concludes.

## 2. Background: Shocks, Microsavings and Mobile Money

### Financial Access

The FinMark Trust has measured access to financial services in Africa by conducting a number of national surveys exploring individuals' usage of and attitudes towards financial services in many African countries. The population is placed along a continuum of usage of financial services across the formal and informal sectors: the formal sector is defined as comprising financial institutions that are legally registered to provide financial services, as commercial banks, post banks, insurance companies, microfinance institutions, savings and credit organizations, among others. The informal sector includes all the organizations that provide financial services but are not legally registered to do this business, ranging from rotating and savings cooperatives or savings clubs, to pawn shops, and loan sharks. Considering this distinction, the adult population has been placed in one of four segments (FinMArk Trust, 2007):

i. Banked: any adult who currently uses one or more traditional banking product supplied by a financial institution;
ii. Formal-Other: Any adult who currently uses one or more other formal product supplied by a financial institution other than a bank, e.g. store account from a retailer, microfinance loan from a registered microfinance institution, insurance policy from a insurance company. These people do not have a bank account, but have at least one financial service from a regulated non-bank financial service provider.
iii. Informal: Any adult who does not have a bank account, or a formal-other service, but has a service from an informal provider, such as savings with a savings club, is said to be operating exclusively in the informal sector.
iv. Financially excluded: the remaining adult population, who do not have any service from a formal or informal service provider.

The FinScope consumer surveys results we report below have been completed in twelve countries: South Africa, Botswana, Namibia, Zambia, Kenya, Tanzania, Uganda, Rwanda, Malawi, Nigeria, Pakistan and Mozambique. The questionnaire is tailored to reflect local conditions, because financial markets differ widely across the African continent. Terminology has been adapted to each local reality, especially for describing informal

products. Chilimba, metshelo, chamas, akiba and stokvels are the names for informal savings clubs in different countries. In some markets entire sectors, such as formal insurance, may be practically non-existent (FinMark Trust, 2009).

The sampling approach is intended to ensure national representation of adult individuals above a threshold age (16 or 18 years). Usually, a multi-level stratified sampling approach is followed to select households within chosen communities, linked to the most recent census.

The samples used in the surveys are summarized in the table below:

| Country | Year | Sample |
|---|---|---|
| South Africa | 2008 | 3900 households in urban and rural areas |
| Botswana | 2009 | 1400 interviews with people aged 18+ |
| Namibia | 2007 | 1200 face-to-face interviews with people aged 16+ |
| Zambia | 2009 | 4000 citizens aged 16+ |
| Uganda | 2006 | 2959 adults aged 18+ |
| Tanzania | 2009 | 7780 interviews with citizens in both mainland Tanzania and Zanzibar |
| Kenya | 2009 | 4214 interviews |
| Nigeria | 2008 | 22000 interviews – the biggest sample size for Finscope |
| Mozambique | 2009 | 5028 interviews |
| Malawi | 2008 | 4993 face-to-face interviews citizens aged 18+ |
| Rwanda | 2008 | 2000 face-to-face interviews |

*Table 1: Finscope sampling methodology – Source: (FinMArk Trust, 2007)*

As shown in fig. 1, in many African countries, less than one in five people have access to a formal bank account (blue bar), and more than half do not participate to any kind of organized form of savings (white bar). The blue lines show how savings banks, credit unions and financial cooperatives have successfully been serving the poor for many years. The black lines show how informal community-based structures have provided financial support among communities through savings-led groups (SLGs) where group members contribute savings to a pooled account, lend a portion of those funds to individual members, and share proceeds (interests) on an annual basis, elect officers to manage the funds, etc.

What we are mostly interested here is about what is happening in the grey area denominated "Formal – other", as it includes very recent developments that are happening in some countries: the emergence of mobile money schemes.

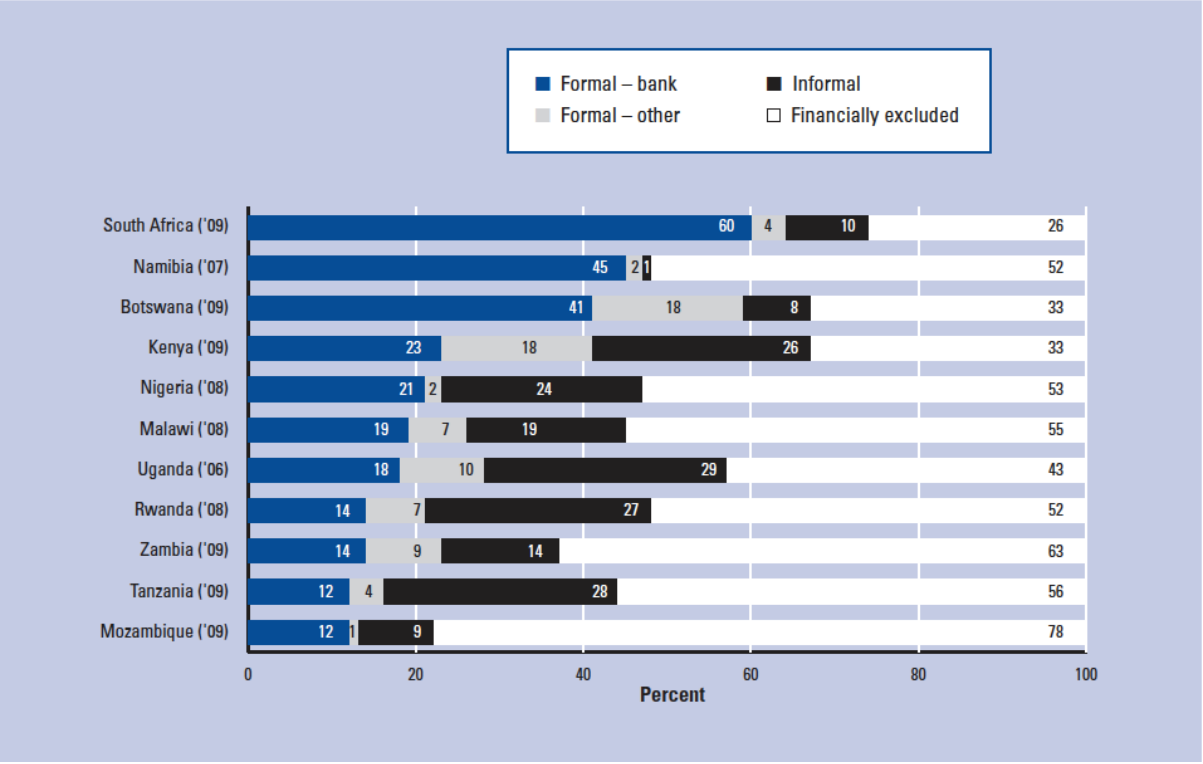



*Figure 1: Financial Access in selected African countries (Source: FinMark Trust - www.finscope.co.za)*

## Microsavings and Shocks

The expansion of microfinance since the 1990s has prompted most policy makers, donors, scientists and practitioners around the world to remark the role of microfinance as a powerful tool for poverty alleviation (Hannig, 1999). Most of the attention has however been focused on providing microcredit even though most poor households everywhere in the world save in some form or another. While mobilization of microsavings is a commercially viable source of funds, it is also much more complex to administer than a credit-only programme, as it presents high transaction costs, requires special management skills and more resources to be deployed on the field (Hannig, 1999). Traditional liquidity and risk management skills are not sufficient but have to be integrated with social competence that allows to overcome social barriers between the microfinance institution staff and their clients, and, even more important, to establish confidence and trust in the institution.

Poor people have difficulties to escape poverty as they are usually engaged in economic

activities with very low levels of productivity (Christen & Mas, 2009). Moreover, they periodically face a variety of "shocks", events that can be overwhelming, like ill-health or death of a family member (sometimes the breadwinner), or natural disasters causing loss of home or crop. For example, (Romero & Nagarajan, 2011) argue that shocks faced by rural Malawians who depend on agriculture for their livelihoods include droughts (frequently), floods beside other adverse events like illness and price fluctuations. (Paxton & Zhuo, 2011) distinguish between *idiosyncratic* shocks, such as illness, death, job loss, and *systemic* shocks, such as low agricultural prices, recession, and natural disaster.
Households too often put in place "sub-optimal" strategies to cope with these adverse events, like reducing consumption and liquidating assets, besides drawing on savings (when available), taking loans and aid or receiving remittances. Those strategies, especially depletion of productive assets and reduction in permanent consumption, inevitably have a negative consequence on future incomes, resulting in long-term effects on household well-being (Romero & Nagarajan, 2011).

While microcredit works as an ex-post shock-coping strategy, micro-savings, which can act as a sort of micro-insurance, are now being considered as an important ex-ante strategy to mitigate shocks.

By using innovative financial tools that allow to save small amounts over time, they can therefore invest in new tools to improve the productivity of their businesses. Saving effectively helps them to eat regularly and improve their nutrition, not to mention investing in children education, which is a productivity improvement itself. Finally, saving small amounts over the time or insurance products can help poor people mitigate shocks. In conclusion, providing poor people with means to save (and buy insurance) can help them in three ways:

i. by giving them ways to increase their productivity;
ii. by allowing them to maintain their expenditure on nutrition and education during hard times;
iii. by preventing them from falling back into poverty as a consequence of a "shock".

But how do poor people usually save, or how did they use to save so far?

(Christen & Mas, 2009) explain that they use a "variety of informal mechanisms", including: cash hiding in places at home, leaving money to a trusted neighbor or family friend, loaning to relatives, participating in community saving schemes or groups (like the South African *stokvels*, burial societies, etc.), buying livestock or other physical assets. All these forms of savings share a common problem: they are subject to a high risk of loss or theft, and do not offer what a formal financial instrument does: safety, reliability and liquidity.

### What the Poor Look for in a Savings Product

As explained by (Goss, Mas, Radcliffe, & Stark, 2011), customers tend to value financial services that are convenient, trustworthy and affordable, irrespective of their background or environment. Convenience is important as people are not likely to invest time and resources like cost of travel just to save a small amount into an account. Proximity is therefore crucial to guarantee a significant take-up rate: savings need to be captured at source, where and when the money is earned, and before it gets spent on temptation goods or stored in an unsecure location or manner. On the other hand, proximity is also important to allow access to funds when there are needed in a safe and affordable way.

Commercial banks cannot guarantee proximity as they are out of reach for most poor people due to the high costs of building and maintaining physical banking infrastructure in low-density rural areas. Banking penetration averages only two branches per 100,000 people in the poorest country quintile as opposed to 33 in the richest (Goss, Mas, Radcliffe, & Stark, 2011). ATMs are even scarcer in poor countries, averaging only 1.3 per 100,000 people in the poorest country quintile, opposed to 67 in the richest. Besides the physical distance, commercial banks sometimes erect a cultural barrier for poor people who feel they are not welcome at bank branches.

Cooperatives have a better track record as they are usually located where poor people live, especially rural areas. In some countries, Post Banks and State Banks have deployed branches extensively in rural areas, as in the case of Bank Rakyat of Indonesia, which has reached the staggering number of 32 million savings accounts.

Although SLGs are found in rural and remote areas where formal financial institutions are not, they are not permanent deployments. They usually meet once a week and therefore they do not guarantee prompt and consistent access to services.

Instead, mobile operators manage large networks of airtime resellers ("agents") that are deployed in almost every village. These shops are usually connected to the mobile network, allowing them to perform real-time secure transactions. The existing infrastructure can therefore be leveraged to become a network of secure cash-in cash-out outlets. In Kenya, the number of M-PESA agents is now more that five times the number of postal outlets, post bank and commercial bank branches and ATMs combined together.

Another important feature people consider when deciding about shifting their wealth from physical assets to a savings account is security. They must feel their money will be safe and their deposits will be kept private from neighbors and family. Formal financial institutions are able to gain people's trust through their brick and mortar branches, branding and providing receipts or deposit books. Mobile money accounts have a similar risk exposure than commercial banks, as funds are deposited in "pooled accounts" in regulated banks. One important feature is that mobile transactions are processed in real-time, therefore customers can verify if a payment has gone through when they receive an SMS confirmation on their phone, the same applying to their beneficiaries.

Savings at formal or semi-formal financial institutions is seen as a more secure way of keeping household wealth which otherwise would be prone to theft or depletion. (Wright & Muteesassira, 2001) analyzed data from an experiment conducted in Uganda between 2006 and 2009 (Buehren, 2011), and found that only 15 percent of the respondents experienced any loss of savings kept at banks over the previous 12 months, compared to 27 percent for money kept with semi-informal institutions like ROSCAs[1] (Rotating Savings and Credit Association) or 40 percent with ASCAs[2] (Accumulating Savings and Credit Associations). Although riskier than formal institutions, semi-informal institutions are still much safer than the other two most used informal devices: keeping money at home or in kind, which shows loss rates of 68 per cent and 75 per cent respectively. The interesting aspect of the research

[1] Informal savings and credit groups in which each member deposits the same amount of money at the same regular interval; each time members deposit, they give the whole of the amount collected to one member. When there have been as many distributions as there are members, the ROSCA ends. Everyone has put in and taken out the same amount; for example, ten people each save $10 a week, and each week for ten weeks one person walks away with $100. *Source: CGAP*

[2] Informal savings groups that resemble ROSCAs but are slightly more complex. In an ASCA, all members regularly save the same fixed amount while some participants borrow from the group. Interest is usually charged on loans. ASCAs require bookkeeping because the members do not all transact in the same way. Some members borrow while others are savers only, and borrowers may borrow different amounts on different dates for different periods. If members pay interest on their loans, the return to savings has to be individually calculated and fairly shared among the group. *Source: CGAP*

by (Wright & Muteesassira, 2001) is the "broad concept" of insecurity: 45 per cent of those admitting to declare losses of cash kept at home blamed their own petty spending as responsible. Another 27 per cent admitted their losses were caused by demands of family members or friends for assistance. Therefore while formal savings can effectively eliminate the risk of losing savings as a result of theft, they act as a barrier to losses incurred as a result of petty spending or demands by people outside the household, but cannot prevent it completely.

This is confirmed by other studies, like the one from (Mullainathan & Shafir, 2009), that shows that keeping money in a bank account reduces the ability and the temptation to spend it immediately, making it easier to accumulate assets. When money is saved in a bank an active effort is required to withdraw it in order to spend it. These studies have confirmed that poor households find it difficult to protect their cash assets from demands from family and friends and result to risky mechanisms to hide their wealth (Dupas & Robinson, 2008).

Finally, besides proximity, availability and security, there are two other arguments that are mainly reported in the literature as a reason for underutilization of formal savings mechanism (Mullainathan & Shafir, 2009):

i. Simplicity: complicated access and working mechanisms of saving services represent an "entry barrier" to the formal and semi-formal sector;
ii. Affordability: transaction costs, in the form of administration costs, opening fees and minimal balance requirements that are excessively high compared to the small amounts saved by the poor.

Straightforward terms and conditions expressed in local language are a key to success. Commercial banks terms and conditions are instead too often difficult to understand, too long or written in "legal", unfriendly language. Customers end up complaining about "losing" their money when they get deducted monthly fees not related to a specific transaction.

Mobile money operators instead go out of their way to make it as easy as possible for clients to try their services. Registration and deposit are often free and the accounts require only a minimum balance, while fees are charged per transaction but no monthly fee is charged. The customer has the feeling of getting charged only for "doing something" with the account

(Goss, Mas, Radcliffe, & Stark, 2011). Fees are simple, clear, based on transaction and posted to the walls or windows at the agent outlet.

Evidence shows a huge difference in take-up rates between savings products that require commitment savings or charge withdrawal fees (often prohibitively high) as opposed to simple informal savings technologies or products that are fully liquid and do not charge withdrawal fees at all (Mullainathan & Shafir, 2009).

## New Banking Models for the Poor: The Rise of Mobile Money

New banking models are needed in order to allow poor people to save on a daily basis and directly from where they live. This can be accomplished with the help of two actors (Christen & Mas, 2009):

i. existing retail outlets, which can be leveraged to act as cash transaction points, eventually acting on behalf of licensed financial institutions where required by the regulators;
ii. mobile operators, who can manage the "channel" by providing the money transfer application and act as transaction aggregators.

(Aker & Mbiti, 2010) report that over the past decade mobile phone usage in Sub-Saharan Africa has registered a significant growth and now covers 60 percent of the population. This exceptional rate of adoption has resulted in the proliferation of applications in diverse sectors including agriculture, health, education, emergency response and governance. Mobile phones are used to send reminders to HIV-positive patients about their anti-retroviral therapy schedule in Kenya, Malawi and South Africa. In Agriculture, they are used to send market and price information, like consumer prices for staple grains in West Africa, therefore replacing message boards or traditional market information systems.

(Donovan, 2012) defines mobile money as "the provision of financial services through a mobile device". However, mobile money is not just a technology. In order to be effective, it

requires an entire “ecosystem” to be put in place, where the central role is played by a network of “cash merchants” (or “agents”) that provide the necessary cash-in and cash-out infrastructure. Agents usually receive a commission for their services, basically turning electronic value into cash and vice-versa.

The majority of the mobile money deployments are in the developing world, with half of them in Africa alone, as reported by the GSM Association (Donovan, 2012). The reason for this success is that all is required to deploy the network of agents is a wireless (or mobile) phone network, instead of the heavy investments and infrastructure that would be necessary to deploy bank branch offices, especially in rural areas.

One of the most successful and interesting services offered are micro-insurance products to help smallholder farmers when their crops fail. M-PESA has been used in this case to provide cash payouts, resulting in more than 12,000 farmers insured within the second year of operations and 10 per cent of them receiving payouts of up to 50 percent of their insured inputs (Sen & Choudhary, 2011)

## The Success of M-PESA

M-PESA, a mobile system operated by Safaricom in Kenya, reached almost 40% of the population within 2 years after launch and in 4 years it was used by more than two-thirds of households (Jack & Suri, 2011). While the service initially targeted the lower-end households, it is now increasingly used by a broader range of households with diverse demographic, educational and economic characteristics. The reasons for the success of M-PESA are multiple: while its broad and expanding network of agents (now over 23,000), reaches households in the most remote areas, the product itself is considered faster, cheaper, more reliable and safer that all its predecessors.

(Jack & Suri, 2011) argue that M-PESA users are able to accumulate savings on their accounts as they do not have to withdraw or send their balance immediately.

While the system has been initially launched as a money transfer alternative to incumbent like banks and money transfer companies, and as a tool to purchase at selected shops or to pay bills and school fees, they note in they research that it is increasingly used for savings. The major reasons people cite for using M-PESA to save are that it is easy to use (40 percent)

and safe (26 percent). They also found a dramatic increase in the percentage of households saving for emergencies from 12 percent in round 1 of their survey to 22 percent in round 2, while the reason cited for not using it to save was either absence of need or lack of access.

One of the main reasons of M-PESA success is the offer of a very competitive service with a very attractive transaction cost (Omwansa, 2009). For example, to send KShs. 35,000 (approx. US$ 500) using a money transfer company such as Western Union it would costs KShs. 1,200 (approx. US$ 17) within the country, while using M-PESA to send the same amount would cost only one third of the fee. Considering the setup fees and operational costs of banks and money transfer companies, they cannot afford to offer similar competitive rates. While in Kenya still 38 percent of people don't have a bank account, M-PESA provides a convenient and safe alternative, as they can withdraw cash at any time at a minimal fee and even in case the mobile phone gets stolen, no one can access their account without a personal identification number.

The rapid uptake of M-PESA is not surprising considering the level of financial development in Kenya and Sub-Saharan Africa in general (Aker & Mbiti, 2010). They report that as of 2008, in East and Southern Africa an average of less than 30 per cent of the population had an account with a formal banking institution, ranging from a low of 9 per cent in Tanzania to a maximum of 63 per cent in South Africa. In Kenya in particular in 2006 there were only 450 bank branches and 600 automatic teller machines, an average of less than two branches per 100,000 people. Kenyans relied therefore on other mechanisms to send money, including Western Union money transfers, post office, intermediaries such as bus drivers or friends and relatives. Transfers via Western Union are secure but very expensive, and are not always available in rural areas. The other systems all carry a high risk of theft. Sending money from Nairobi to the Western Province via M-PESA costs instead two-fifths of the post-office rate in 2008 and one-fifth of sending it via bus.

## 3. Field Experiments and Surveys

In this paragraph we will review some recent field experiments and surveys that investigate the impact of improved access to microsavings accounts, generally offered by MFIs, on savings behavior of the affected communities. A summary of the studies and their significant features are drawn in table Table 2. We also will discuss the methodological limitations in each of those studies.

In some of the experiments, like the ones from (Romero & Nagarajan, 2011), (Flory, 2011), and (Buehren, 2011), the intervention is on the demand-side, through information campaigns, by lowering information and other barriers to access. Others like (Prina, 2012), and (Dupas & Robinson, 2008) act on the supply-side by intervening on barriers like account-opening and maintenance fees. We then introduce two surveys by (Marinangeli & Presbitero, 2011), and (Paxton & Zhuo, 2011) on how formal financial savings are related to economics shocks. Finally we present two surveys (Rotman, Rasmussen, & Ferrand, 2012), and (Demombynes & Thegeya, 2012) related to mobile money adoption in Kenya and South Africa, who found a positive correlation between ownership of a mobile money account and improved savings behavior. We conclude with a survey is on the uptake of mobile money and branchless banking on South African Metropolitan Townships (ikapadata, 2012).

| Author/Year | Country | Research Goal | Sample Size | Research Method | Key Findings |
|---|---|---|---|---|---|
| (Romero & Nagarajan, 2011) | Rural Malawi | Study the impact of OIBM on the ability of its clients to effectively manage shocks | 2,006 households | Matched-Pair Cluster-Randomized Encouragement Trial (RET) Design. Quasi-experiment with matched-pair approach using age, gender, occupation. | No statistically significant impact. Differential impacts based on wealth distribution, with median wealth households using less sub-optimal strategies. |
| (Flory, 2011) | Rural Malawi | Study effects on transfer from relatives and friends ("safety nets") as a tool to smooth consumption and cope with shocks. | 2, 000 households | Matched-Pair Cluster-Randomized Encouragement Trial (RET) Design. Quasi-experiment with matched-pair approach using age, gender, occupation. | Boosting usage of formal savings increases inter-household transfers significantly during peak period of hunger. Poorest households also impacted by spillover effects. |
| (Paxton & Zhuo, 2011) | Rural Mexico | Examines how household formal financial savings fluctuates with economic shocks and other relevant variables. | 587 households | Survey. Empirical model with CUSUMSQ and Rainbow tests | Negative relation between formal savings and number of shocks, implying vulnerable households tend to build up precautionary savings to be drawn afterwards. The impact of negative shocks on formal savings is only statistically significant in households with a high propensity to save. |
| (Buehren, 2011) | Uganda | Investigating the impact of the BRAC programme on the saving behavior of participant (demand side only). | 1,823 borrowers at baseline, 2,348 at the repeat survey. Attrition was high at 21%. | Randomized Control Trial, with randomization taking place at the cluster level. Two-thirds of the clusters assigned to the treatment group and one-third to the control group. | Shows an increase of 9 percent in the usage of semi-formal financial institutions and a boost to the amount held as a result of the information programme. Illiterate individuals and the ones who recently experienced theft are more prone to respond. |
| (Dupas & Robinson, 2008) | Kenya | Effects of removal of transaction costs on saving uptake | 173 market vendors, stratified by gender/occupation | Randomized Control Trial, the treatment group was offered option to open an account at the village bank at no cost. | Women in the treatment group increase their savings, business investments, income and expenditures while the effects on men are marginal. |

| | | | | | |
|---|---|---|---|---|---|
| | | | (83% women) | | |
| (Prina, 2012) | Nepal | Investigates the impact of improved access to a fully liquid formal savings account with no withdrawal fees on borrowing behavior, assets accumulation and investment in health and education. | 1236 households. Only households with a female head between the ages of 18-55 were sampled. Used public lotteries to divide sample into treatment and control group. | Randomized Control Trial, the treatment group were offered the option to open a savings account at the local bank-branch office. | 80% of individuals offered the account actually used it, savings an average of 8% of their weekly income. Showed accumulations of small sums into large sums over time, that were occasionally withdrawn to pay for health and education expenses. |
| (Marinangeli & Presbitero, 2011) | Bangladesh | Analyze determinants and effects of voluntary microsavings (beyond the minimum required by the MFI) for poor households | 98 women members of a MFI. Convenience/non probability sampling. | Survey submitted to member of Hitaishi, a MFI in Dhaka. | The poor are financially more sophisticated that conventionally thought and use several savings devices. A significant share of individuals save in excess of the compulsory amount requited by the MFI. Evidence of an unmet demand for safer, formal saving devices |
| (Rotman, Rasmussen, & Ferrand, 2012) | Kenya | Investigate if mobile money through M-PESA would improve the P9 model by enabling the movement of small amounts of money instantly at a relatively low cost as well as enabling enhanced customization of product terms and features. | 183 clients signed up for Phase 3 used for the analysis. | Survey. Interviews with the clients from the sample. | Seven out of ten reported the product helped them save, keeping their savings safe and preventing them from early spending. |

| | | | | | |
|---|---|---|---|---|---|
| (Demombynes & Thegeya, 2012) | Kenya | Examine the mobile savings phenomenon, by differentiating between "basic" and "bank integrated" mobile savings. Is there any evidence that use of M-PESA may increase the prevalence of savings behavior? | 6,083 individuals for the first survey. 2,692 observations in the extensive questionnaire. | Survey and mobile savings data including product usage, savings behavior, mobile phone ownership and usage, mobile savings awareness and M-Kesho usage. | Overall, 65 percent of M-PESA users report having some savings, compared to 31 percent of those who are not M-PESA users, for a difference of 34 percent. Savings are more likely for individuals who are male, married, living in rural areas, and have higher levels of education, reported income, and wealth. The usage of bank-integrated mobile savings systems like M-KESHO remains limited and largely restricted to better-off Kenyans. |
| (ikapadata, 2012) | South Africa | Prevalence of branchless banking services in South African townships. | 1008 interviews | Survey. Questionnaires are formatted so that they can be submitted in text format over mobile devices instead than pen and paper. | 99% of respondents claim to own a cellphone, with 26% claiming to do mobile banking or use mobile money services. The figure is significantly higher in respondents in higher LSM groups. |
| (FinMark Trust, 2009) | Africa | Measuring Access to Financial services | 22,400 respondents in seven surveys across Southern and East Africa | Survey | |

*Table 2: Summary of Previous Research Findings*

## Limitations

All the studies we found in our literary review had some methodological limitations.

(Romero & Nagarajan, 2011) and (Flory, 2011), used a quasi-experiment strategy as described by (Saunders, Lewis, & Thornhill, 2012, pp. 174-176), where participants are not assigned randomly to experimental and control groups, but rather a matched-pair approach is used, where individuals or households are matched based on factors like age, gender, occupation and then one of them is randomly assigned to one of the groups. A baseline survey is then conducted to measure the variables before any intervention occurs. A planned intervention is then directed to the members of the treatment group, usually in the form of an information or marketing campaign conducted by the relevant bank, MNO or MFI. The variables are then measured again, usually after a period than can be from 6 months to two years, so that a comparison can be made.

In particular, (Romero & Nagarajan, 2011) and (Flory, 2011), admit that although a Randomized Control Trial, which assigns a randomly selected part of the population to a savings product and withholds that product from the rest, would have been an ideal strategy for identifying the causal impacts of the program, it was not logistically feasible in practice, as they could not physically prevent anyone from joining the bank. Moreover, it would not have been ethically fair to exclude potential clients from joining a programme that could have been beneficial to their household. Therefore they adopted a research strategy based on a Randomized Encouragement Trial (RET) design. The RET methodology entails randomly selecting a part of the population and offering them "encouragement" to join the programme through an information campaign that explained the terms, conditions and application process to open the savings accounts. These would form the treatment group, while the control group would not receive any encouragement. As it was not be feasible to discriminate at individual level, sampling was implemented through clusters (group of villages), where cluster pairs (one in the treatment group and one in the control group) were matched based on similar characteristics like population and distance from trading centers. The resulting design is usually referred as "Matched-Pair Cluster-Randomized Encouragement Design". The baseline survey in this longitudinal study was conducted in early 2008 while the follow-up in the same period in 2010, marking a 2 years span.

A similar approach has been adopted by (Buehren, 2011), where randomization has taken place at the cluster level (each cluster formed by microfinance groups formed from the MFI branches), with two-thirds of the clusters assigned to the treatment group and one-third to the control group. The microfinance groups in treatment were assigned "savings promoters" who ran the informational campaigns. In this case a longitudinal study was implemented, with a follow-up survey conducted 6 months after the baseline survey.

(Prina, 2012) adopted a similar design, with a baseline survey conducted to collect information on household composition, education, income, income shocks, asset ownership, borrowing and expenditure behavior, and a endline survey conducted one year after the beginning of the programme. A strong information campaign was conducted by the bank in between with community meetings and public lotteries were held to randomly assign the female household heads to either the treatment group (offered the savings account) or the control group (not offered the savings account). The public lottery mechanisms worked as a strong incentive and could explain the very high take-up of the service among the treatment group (80%).

Other studies, like (Jack & Suri, 2011), (Marinangeli & Presbitero, 2011), (Paxton & Zhuo, 2011), and (Demombynes & Thegeya, 2012) followed a survey strategy. (Jack & Suri, 2011) adopted a longitudinal design where there was not any intervention between the baseline survey and the follow-up one, but the 2 surveys were compared based on increased adoption of the savings mechanism over time. (Marinangeli & Presbitero, 2011) and (Demombynes & Thegeya, 2012) adopted instead a cross-sectional design. Although (Demombynes & Thegeya, 2012) conducted only one survey, they submitted a more detailed questionnaire to members labeled as "users of M-PESA", that constituted a subset of 2692 from the total of 6083 observations.

Similarly (Marinangeli & Presbitero, 2011) admit they could not randomly select the respondents in their survey and the sample coincides with the borrowers the MFI collectors visited on a regular basis. The cross-sectional explanatory study was implemented with a survey where 98 structured interviews were conducted in the slums in Dhaka. In order to assess whether saving strategies are effectively correlated with the household perceived capacity to cover unexpected expenditures, they constructed a dummy variable MANAGE RISK, which is equal to one for individuals who in the survey declare that their capacity to

deal with unexpected expenditures has improved since joining the savings programme, and zero otherwise.

### Impact of Micro-Savings on Shock Coping Strategies in Rural Malawi

(Romero & Nagarajan, 2011) ran an experiment to gather data from a survey of 2,006 randomly selected households in Central Malawi on their use of financial services after the introduction in 2007 of the Opportunity Bank of Malawi (OIBM). OIBM was a "bank on wheels" operated from a truck driving through villages in Central Malawi that was targeting its savings products to households in rural areas. The focus of the study was on the impact of OIBM on the ability of its clients to effectively manage adverse shocks (ex-post) and sustain their levels of consumptions prior the shocks (ex-ante).

The analysis of the sample of 2,006 rural Malawians showed no statistically significant impact of improved access to savings services in reducing the use of sub-optimal shock coping behavior among the population. These included no-action, reducing consumption and depleting productive assets. However, differential impacts were recorded based on the wealth level of the households. In particular, households at the top of the wealth distribution showed less reliance on asset depletion as a strategy to cope with shocks. As expected, the effect was opposite for households at the bottom of the wealth distribution. Median wealth households in areas with high uptake of OIBM services used less of all three sub-optimal strategies. Particularly significant was that they used less asset depletion strategy to deal with two types of shocks that are known to affect severely the majority of assets in that area: increased input prices and crop diseases.

One of the reason indicated by (Romero & Nagarajan, 2011) for the failure of OIBM to address the needs of poor households were:

i. The low-frequency of visits by the OIBM mobile bank (only twice a week);
ii. Short service period of three to four hours per visit;
iii. A withdrawal fee that limited the access to savings;
iv. Terms and conditions suited better the wealthier households.

## Another Experiment in Rural Malawi on Intra-Family Remittances

In another field experiment in rural Malawi, (Flory, 2011) explained that households situated in developing regions that are vulnerable to extreme poverty often rely on "safety nets" based on transfers from relatives and friends, helping them go through shocks and smooth consumptions across food-deficits. Using a panel dataset of over 2,000 households in Central Malawi, (Flory, 2011) showed that experimentally boosting usage of formal savings instruments in rural areas increases inter-households transfers significantly during peak periods of hunger. The analysis shows that safety nets and outcomes of the poorest households are strongly impacted by formal savings expansion. In particular, inter-households wealth-flows increased significantly as a consequence of the introduction of formal savings technologies in the short-term, with the proportion of those receiving cash-gifts from other households in the hungry season increasing as much as 50 per cent. Moreover, estimates of the variables indicate a three-percentage point increase in the probability of receiving a cash gift experienced by the worst-off households for every percentage point increase in the proportion of local households using formal savings. Treated communities showed a 33 to 40 percent saving adoption rates higher than control communities, with highly vulnerable households receiving a loan from relatives or friends increased by an estimated rate of 15.8 to 22.4 percent over a two year period (Flory, 2011). One interesting aspect of the study is that while the poorest appear ineligible to take advantage of easier access to formal savings, they are the most strongly impacted by spillover effects of formal savings on inter-household assistance.

## Mexico Survey on Relation between Shocks and Other Variables

In a survey on 587 marginalized cooperative member household in rural Mexico, (Paxton & Zhuo, 2011) show how formal financial savings are affected by economics shocks and other relevant variables. (Paxson, 1992) already showed that Thai farm households tendency to save is high due to economic shocks, indicating that income fluctuations do not have serious welfare consequences for those households as savings are used as a buffer to smooth consumptions and cope with economic shocks. A negative relationship between formal financial savings and number of shocks exists, as savings are accumulated before shocks and used during and after shocks to offset income variability. (Paxton & Zhuo, 2011) reached similar conclusions with their analysis, with regression results showing that variables like

income, wealth, formal credit, percent of non-working member in the household, distance from the nearest branch and education have a significant influence on the amount of formal savings for the poor households they investigated. The regression analysis between formal financial savings and the independent variables finds a positive relationship between formal savings and shocks, but once a wealth/shock interaction term is included, the relationship becomes negative. This implies that vulnerable households tend to build up precautionary savings and wealthier households tend to draw down savings after experiencing a shock (Paxton & Zhuo, 2011).

### Field Experiment in Uganda on the Role of Information

Another experiment recently reported is the Saving Mobilization Program implemented by the non-governmental organization Building Resources Across Communities (BRAC) in Uganda. BRAC originated as a microfinance lender in Bangladesh, but since 2002 started to deliver its services in other countries. In Uganda they started in 2006 as a regional subsidiary but have rapidly expanded to reach over 100,000 microfinance clients by September 2009 (Buehren, 2011).

The experiment by BRAC in Uganda is directed to removing the informational barriers by educating participants in the experiment group on the importance of saving and informing them on available mechanisms especially in formal financial institutions. The intervention therefore concentrates exclusively on the demand for formal financial services without intervening on the supply of those services, with the cost structure of available saving devices left unchanged.

The analysis shows an increase of 9 percent in the usage of semi-formal financial institutions and a boost to the amount held as a result of the information programme. The total amount of savings is however unchanged suggesting that the program has caused primarily a reallocation of monetary wealth from informal savings to semi-formal savings mechanisms. The analysis shows that illiterate individuals and the ones who recently experienced theft are more prone to respond to the programme. (Buehren, 2011)

## Kenya Experiment with Free Accounts

(Dupas & Robinson, 2008) reported the result of a field experiment where a randomly selected sample of market vendors in rural Kenya has been offered to pay the opening fee and minimum balance required for a savings account. The experiment therefore focuses on the removal of the transaction cost and disregards possible informational gaps. The results show that women in the treatment group increase their savings, business investments, income and expenditures, while the effect on men is marginal. The authors conclude that one possible explanation is that men can save at home more securely, therefore suggesting that promotion programs for formal saving devices should be addressed more effectively to women rather than men.

## Field Experiment in Nepal on Accounts with no Withdrawal Fees

In another field experiment (Prina, 2012) investigates the impact of improved access to a fully liquid formal bank savings account with no withdrawal fees on borrowing behavior, assets accumulation and investment in health and education. The savings account was offered to a random sample of poor female households heads in 19 slums in Nepal, using local bank branches. The results reported show that 80% of the individuals offered the account used it actively, making an average of 0.8 deposits per week and saving about 8% of their weekly income. Households made an average four withdrawals within the first year of opening the account, each approximately equal to one week income.

Households' savings behavior showed an accumulation of small sums into large sums over time, that were occasionally withdrawn to pay for health or education expenses, to buy food or to repay a debt. Access to savings account increased household monetary assets by 50%, without crowding out investment in non-monetary assets like livestock. The results of the expanded access to a savings product were found to be more effective on households at the bottom and middle of the asset distribution than for those at the top of the distribution. As for the effects on savings behavior, evidence showed that households in the treatment group were keeping less money at home, spending less on petty spending and showed reduced involvement in informal arrangements, like loans to friends or people outside the household.

### Bangladesh Survey on Voluntary Savings and Ability to Manage Shocks

(Marinangeli & Presbitero, 2011) used an original survey submitted to 98 Bangladeshi women member of Hitaishi, a Dhaka-based microfinance institution to analyze determinants and effects of voluntary microsavings (i.e. savings beyond the minimum required by the MFI) for poor households. The analysis confirms that the poor are more financially sophisticated than conventionally thought and they use several different (formal and informal) saving devices. From the evidence that a significant share of individuals save in excess of the compulsory amount required by the MFI, voluntary savings are often carried out through informal, risky channels and are perceived by the authors as evidence of an unmet demand for formal, safer and more flexible and affordable saving devices.

One interesting part of the study shows a correlation between saving strategies and the household perceived capacity to cover unexpected expenditures. They found that working women are 16.7 per cent more likely to deal with unexpected expenditures than non-working ones, irrelevant of education, marital status and age. Living in large household also raises the probability of being able to cope with shocks, and the number of years since the individual joined the programme is positively correlated with risk management. Specifically they found a positive correlation between the perceived ability to manage shocks and the status of voluntary saver, with voluntary savers 20 percent more able to cover unexpected expenditures than women who rely only on compulsory savings.

### The Jipange KuSave Experiment in Kenya

The Jipange KuSave Experiment in Kenya was based on testing a P9-type product over a mobile network. P9 was a product developed by Stuart Rutherford at SafeSave[3] in 2007, based on the "lend-to-save" model (Rutheford, 2011). According to this model, clients take an interest-free loan, one-third of which is placed into a savings account. The client repays the loan at the pace she chooses, and once she repays the loan in full she becomes eligible for a larger loan under the same conditions. Her savings grows as she takes subsequent loans until eventually her savings balance covers the value of her next loan such that she is

[3] SafeSave is a microfinance institution that works in nine low-income areas of Dhaka, the capital of Bangladesh. The organization was founded in 1996 by Stuart Rutherford, a microfinance worker from the UK, and Rabeya Islam, a Dhaka housewife with many years experience of running savings clubs among poor people. Source: www.safesave.org

technically borrowing from her own savings. Clients are encouraged to set savings target with a penalty levied if money is withdrawn before the target is reached. (Rotman, Rasmussen, & Ferrand, 2012).

In Kenya, a new company called Mobile Venture Kenya Ltd. decided to test a P9-type product over a mobile network, by leveraging on the broad take-up of M-PESA. In 2010 they launched a product called Jipange Kusave (JKS), that in Swahili means "to organize oneself to save". As in the P9 model, a client receives an interest free loan, part of which is held as savings. With JKS the funds disbursed are deposited directly in the M-PESA mobile wallet. Repayments were also done through M-PESA, eliminating therefore the need for field collectors and reducing substantially costs for the microfinance organization. The only direct contact was established at the moment of initial recruitment and registration of the client. The clients recruited were usually financially aware and banked, with just over half of them from urban areas and the rest from rural areas. However, this client profiling does not imply that they were not poor, with the authors indicating that the probability of each client living with less than US$2.50 per day still at 41 per cent. The result of the experiment showed that seven out of 10 clients reported that the most valuable feature of the product was that JKS helped them save, while keeping their savings safe until they reached their targets and preventing them from early petty spending. The experiment showed in particular that clients are interested in an innovative savings product that delivers immediate liquidity. The technology allowed features not viable with a traditional product, like an account management system that once received notification that a client had made the final loan repayment on her existing loan, it would then disburse the next loan within an hour. Moreover, the product could potentially be deployed to mass-market low-income clients through an existing mobile channel, although initial client acquisition required involvement of agents (Rotman, Rasmussen, & Ferrand, 2012).

### M-PESA Users Survey on Saving Behavior

(Demombynes & Thegeya, 2012) conducted a survey with data collected from 6,083 individuals between October and November 2010, categorized between M-PESA users and non-users. A more extensive questionnaire was administered to M-PESA users, with a sample of 2,692 observations.

Mobile savings data collected included product usage, savings behavior, mobile phone ownership and usage, mobile savings awareness and M-KESHO usage. M-KESHO was a savings product (an interest bearing savings account) specifically directed at M-PESA users. A wealth index was created using variables like households items possessed (radio, refrigerator, microwave), quality of toilet facilities (flush toilet vs pit latrine), quality of water source (piped water vs rainwater), quality of walls (stone vs mud) quality of roofing material, number of rooms in the household etc.

The respondents were asked whether they save a portion of their income and were offered a list of non-mutually exclusive options including bank account, M-PESA, M-KESHO, ROSCA, ASCA, microfinance institution and other.

The results show that 65% of M-PESA users report having some savings, compared to 31% of those who are not M-PESA users, for a difference of 34%. Also the average amount saved is substantially larger for those who save with accounts other than M-PESA. M-PESA savings are less than savings with other vehicles but still substantial. The difference can be explained with the fact that those who save with accounts other than M-PESA tend to be wealthier individuals who save more. Among those in the poorer quintile, the differences in amount saved are thin: 1,052 KShs. for M-PESA savers, 1,075 for other accounts and 1,130 for those who save with both M-PESA and other accounts.

Of course this does not imply a casual relationship between the two variables as individuals who are M-PESA users may already be more likely to save than those not registered, as for example they can already afford a mobile phone and are able to pay the M-PESA transaction costs. Although the authors try to address this possibility using an instrumental variables strategy that leads to the conclusion that registration for M-PESA increases the likelihood of having some savings by 20 percent, they admit their identification strategy has weaknesses.

### Branchless vs Traditional Banking in South Africa's Metropolitan Townships

(ikapadata, 2012) conducted a survey in April 2012 through 1008 interviews with residents of Metropolitan Townships in Johannesburg, Cape Town, and Durban on the prevalence of

branchless banking services in South African townships. Mobile money and branchless banking were offered for the first time in South Africa by WIZZIT in 2004. It was then followed by MTN Mobile Money, a partnership between MTN and Standard Bank, who offered easy access to their account via phone and internet. Although WIZZIT and MTN Mobile Money both offered branchless banking, they required their customers to apply for a bankcard and other basic services at the bank's outlets. M-PESA South Africa, launched by Vodacom in partnership with Nedbank in 2010, took a more decentralized approach in the attempt to replicate in South Africa the broad networks of agencies deployed by M-PESA in Kenya. They require users to register at a participating outlet before they can send money to other cellphone owners. FNB launched in 2009 eWallet, allowing users to receive cash sent via cellphone or pay cash to another cellphone owner without physically signing up. In order to receive cash for the first time, users can register at a FNB branch or PEP store. Recently MTN has launched a new mobile money service called Mobile Money in partnership with Bank of Athens, Pick and Pay and Boxer retail outlets. They claim users will be able to execute transactions like transferring money to other cellphone users, buying prepaid airtime and electricity, deposit and withdraw cash and pay for goods at the participating outlets with no monthly fees and no minimum deposit.

The survey shows that 99% of the respondents claim to own a cellphone, with two-thirds using proprietary "feature-phone" systems (mainly basic Nokia and Samsung phones) and one-third using a smartphone. While the main functions the phones are used for are calls and text messaging, 26% of the respondents claims to do mobile banking or use mobile money services on his/her cellphone, with the figure being significantly higher for respondents in higher LSM[4] groups (44%) as opposed to medium (23%) and lower (18%) ones. The results also show that unlike other areas of Africa and rural areas in South Africa, the majority of respondents (85%) claim to have an account with one of the established South African banks. A relatively small proportion of the surveyed population (18%) uses services that rely purely on mobile or branchless banking. This percentage climbs to 34% for the higher LSM groups, and it is also higher for smartphone users compared to feature-phone ones. Among the traditional bank users, FNB customers are the ones with highest utilization of the bank's

[4] The SAARF LSM (Living Standards Measure) has become the most widely used marketing research tool in Southern Africa. It divides the population into 10 LSM groups, 10 (highest) to 1 (lowest). The SAARF LSM is a unique means of segmenting the South African market. It cuts across race and other outmoded techniques of categorising people, and instead groups people according to their living standards using criteria such as degree of urbanisation and ownership of cars and major appliances. (Source: saarf.co.za)

internet and mobile services and are simultaneously the least likely to visit a branch in person.

# 4. Research Methodology

## Research Design

This research uses a quantitative design. Most of the data we collected are categorical or ordinal, and hey all numerically coded.

We conducted an household survey in Khayelitsha in October 2013, where data from a total of 528 households has been collected through structured face-to-face interviews. The questionnaire is included in Appendix A: Questionnaire and Variables List.

Due to time-constraints, this is a cross-sectional study. A longitudinal research would require a follow-up survey to be conducted from 6 to 12 months time from the first one, so it is beyond the budget and time limitations of this research.

Our choice of strategy and design is in line with the studies we found in the literary review, in particular those of (Jack & Suri, 2011), (Marinangeli & Presbitero, 2011), (Paxton & Zhuo, 2011), and (Demombynes & Thegeya, 2012). Other studies, like (Romero & Nagarajan, 2011), (Prina, 2012), (Flory, 2011) and (Buehren, 2011), adopted an experimental or quasi-experimental strategy.

## Target Population

When planning to carry out a survey, it is necessary to define the geographical areas to be covered and the target population (ST/ESA/STAT/SER.F/98, 2005). In a household Income and Expenditure Survey, for instance, the survey may cover the urban areas and perhaps exclude rural areas. In our instance we are covering South African Metropolitan Townships.

In defining the universe, the exact population to be sampled should be identified. In the above-mentioned survey the universe of first stage units would be Enumeration Areas (EAs) in urban areas and the second-stage would be households in selected EAs. In our instance Khayelitsha has been sectioned into 3 spatial clusters using census data.

It should be pointed out that in practice, however, the target population is somewhat smaller than the population forming the universe. It is usual to restrict the target population for a number of reasons. For instance, in some surveys, some military households in barracks may

be excluded from the survey. In labour-force surveys, children below a specified age may be shown as members of households surveyed, but would not be part of the labour-force.
In our case, we exclude backyard shacks that are used only for sleeping as they are considered part of the same household and individuals with age below 18.

## Sampling

The sampling process can be roughly divided in two phases:

- selection or construction of a sampling frame
- selection of a sample

### Sampling Frame

A perfect sampling frame (the complete list of all the cases in the population, from which the sample is drawn) is one that is complete, accurate and up-to-date (ST/ESA/STAT/SER.F/98, 2005). In particular:

i. A frame can be deemed complete with respect to the target population if all its members (the universe) are covered by the frame;
ii. A frame can be said to be accurate if each member of the target population is included once and only once.
iii. The information in the frame must be non-obsolete

Unfortunately these ideal properties are unattainable in household surveys (ST/ESA/STAT/SER.F/98, 2005, p. 84). The degree to which there is failure to achieve each of the ideal properties produces survey results that are biased in various ways, but often in the direction of *under-estimating* the target population.

In our case of Khayelitsha Metropolitan Township problems could come from:

1) A list frame of households in an EA that is missing some of those living on the perimeter of the area;
2) A list frame of households in an area unit where some of the households are listed in

more than one unit;

3) An obsolete list frame of households that does not include newly constructed dwellings. There is a high probability of incurring in this error especially in areas classified as "informal settlements" where the dwellings are not brick and mortar but are instead shacks that can be raised overnight without informing any authority.

Missing listed households within an area unit mean of course that the affected households have no chance of being selected for the sample, thereby violating one of the conditions for a true probability sample. Duplicate listings also violate the probability criterion unless they are known about so that the true probabilities of selection can be adjusted.

## Sample Design

Virtually all sample designs for household surveys, both in developing and developed countries, are complex because of their two-stage (or multi-stage), stratified and clustered features (ST/ESA/STAT/SER.F/98, 2005, p. 27). In particular:

i. The sample must be selected in stages to pinpoint the locations where interviews are to take place and to choose the households efficiently.
ii. The design must be stratified in such a way that the sample actually selected is spread over geographic sub-areas and population sub-groups properly.
iii. The sample plan must make use of clusters of households in order to keep costs to a manageable level.

The two-stage design consists of a Probability Proportional to Size (PPS) sample of clusters (e.g. communities, villages chosen with a probability proportionate to their size), suitably stratified, at the first stage. A current listing of households may be developed in the first-stage sample units, depending upon the availability of information regarding the address and/or location of the households and whether that information is current.

This is followed by a systematic sample of a fixed number of households at the second stage.

The geographical units, commonly referred to as the "clusters" are usually defined as villages or census enumeration areas (EAs) in rural areas and city blocks in urban areas. In our case the EAs are obtained through a superimposed grid on the map of the township.

## Probability vs Non-Probability Sampling

Probability sampling in the context of a household survey refers to the means by which the elements of the target population - geographic units, households and persons - are selected for inclusion in the survey (ST/ESA/STAT/SER.F/98, 2005).

The requirements for probability sampling are:

i. that each element must have a known mathematical chance of being selected
ii. that chance must be greater than zero
iii. it must be numerically calculable.

It is important to note that the chance of each element being selected need not be equal but can vary in accordance with the objectives of the survey.

A crucial feature and by-product of probability sampling in surveys is that sampling errors can be estimated from the data collected from the sample cases. None of these features are present when non-probability sampling methods are used.

Although probability sampling is conceptually simple, applying it to household surveys is expensive and unfeasible because it requires all the households to be identified prior to the sampling. The cluster sampling methods commonly used in household surveys reduce the need for detailed lists of households to the selected clusters. However, creating these lists (known as sample frames) still requires considerable effort, skill, and resources, which are not always available in low-income countries. The sample frames may not be reliable in situations where:

(i) maintaining the household lists proves difficult (often due to a lack of administrative structure for reporting changes);
(ii) minorities, disadvantaged communities, or migrants tend to be excluded, and
(iii) there is a high rate of migration, as in peri-urban areas or among populations displaced because of events such as natural disasters.

Alternative household sampling methods, which do not use detailed sample frames, have been developed to cater for such situations. (Chalabi & Bostoen, 2006)

To date one of the most popular spatial sampling methods adopted by World Health Organization (WHO) for use in low-income countries is the EPI method, named after the Expanded Programme of Immunization (Chalabi & Bostoen, 2006), also known as "Random Walk".

This method makes use of a modification of PPS (Probability Proportional to Size) sampling developed originally in the USA (Serfling & Sherman, 1975) and modified for use in the smallpox eradication programmes in West Africa (Henderson, Davis, Eddins, & Foege, 1973).

The random walk method can be described simply as follows. A number of clusters (e.g. communities, villages) are chosen with a probability proportionate to their size, and then an equal number of selected households is surveyed in each of the selected clusters. In each chosen cluster the EPI method selects

(i) a location near the centre of the community,

(ii) a random direction (which is often defined in the field by spinning a bottle or pen), and

(iii) a random household along the chosen direction pointing outwards from the centre of the community to its boundary.

In subsequent steps, which are carried out iteratively, the closest household (door to door) to that determined in the previous step is chosen and checked for compliance with the inclusion criteria.

The iterations are repeated until the required number of households is surveyed.

This technique is often used even if the prior stages of the sample were selected with legitimate probability methods. It may entail either selecting every $n_{th}$ household or screening each one along the path of travel to ascertain the presence of a special target population such as children under 5 years old. In the latter instance each qualifying household would be interviewed for the survey until a pre-determined quota has been reached.

Besides the necessity of avoiding the costly and time-consuming expense of listing all the households in the sample area - village or cluster or segment - as a prior stage before

selecting the ones to be interviewed, this methodology is also justified on the grounds that non-response is avoided since the interviewer continues beyond non-responding households until he/she obtains enough responding ones to fulfill the quota.

In our survey, we implemented this methodology as follows:

i. Purposeful sectioning of Khayelitsha into 3 spatial clusters using census data
ii. Random selection of 10 starting points within each section (random GPS coordinates within the confinements of each cluster);
iii. a random number generator in the phone chooses a direction to go from the starting point
iv. a random number generator chooses a side of the street
v. a random number generator chooses a number between 1 and 3 to choose the house

A map of the households we interviewed is showed in Figure 2.

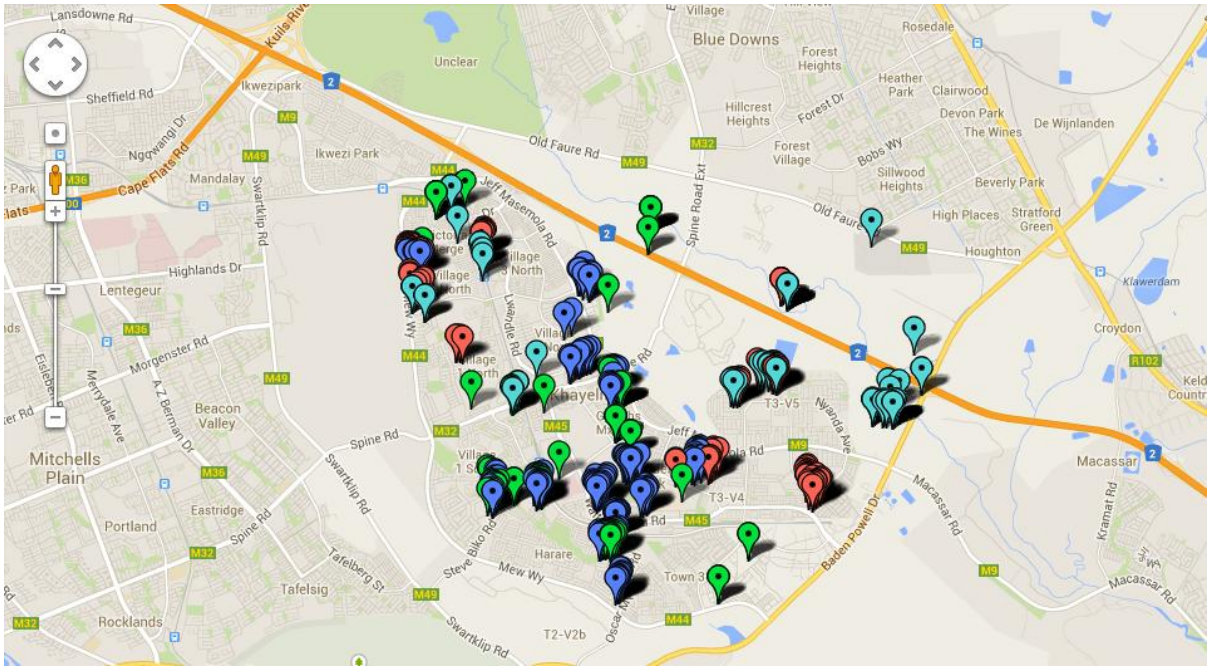



*Figure 2: Map of Interviewed Households*

## Sample Size

The sample size has been calculated in order to guarantee a confidence level of 95%, assuming a confidence interval of 4% to 5% independently of the population size. (Creative Research systems, 2012).

## Data Collection Method

The questionnaire has been formatted in order to be executed on Android phones and devices. All interviewers have been equipped with Android phones allowing them to capture the responses on the device.

The selected interviewers have been thoroughly trained before being sent into the field.
The training programme was necessary to guarantee uniformity in the interviewing procedures of the survey and to avoid differing interpretations of the definitions, concepts and objectives of the survey and hence to minimize interviewer bias. As part of the training interviewers have taken turns in asking questions to each other in a classroom setting.
A one-day pilot has been conducted in order to finalize the questionnaire and resolve the last doubts before actual collection started.

The procedure employed by the field workers can be summarized as follows:

Once a household is selected with the procedure described above, the field workers approach the initial respondent with some questions to determine the number of people living in the household, and have a list of them (name and gender, age).
The system then selects the name of the respondent with a random number generator (older than 18). Is the selected respondent person is available, interview can start, otherwise it will have to be postponed to another time of the day or another day.

In order to minimize non-response, interviewers carried a letter on UCT letterhead explaining the objective of the survey and reassuring the respondent that his data will be treated with maximum confidentiality and anonymity.

One interesting feature of the technology we used for data collection is that it allowed us to reduce interviewer bias as data were collected in near-real time, supplying us the time

employed to conduct the interview, and the location of the interviews. We could therefore verify that shortcuts were not taken. One possible shortcut is when neighbors notice that an interview is taking place and offer themselves for subsequent ones, attracted by the possible reward. This allows the interviewer to finish his work quickly but violates the random-walk principle. GPS data collected about the positioning of the interviews allowed to detect if such shortcuts were being taken. Similarly, if the interview is too quick it shows the interviewer is not following proper process. Without the mobile technology it would have not been possible to detect such errors and take remedy actions.

## Variables

Once an household has been selected, the interviewer will knock the door and will collect the following information from the first respondent:

- Name
- Gender
- Age
- Number of household members

At this point the random number generator will select a respondent among the household members with whom the interview will be conducted. The complete interview is reported in Appendix A.

We defined a *shock* as one of the following unexpected events:

- Death of the household head (breadwinner)
- Death of a household member
- Loss of Employment
- Communal fights
- Household break-up
- Dwelling damaged
- End of regular financial support
- Theft

- Break-in
- Business failure
- Serious Illness/accident
- Steep Rise in food prices
- Livestock dead/stolen
- Other (specify)
- None

*Shock-coping strategies* are defined through the following list:

- Worked more
- Moved somewhere else for work
- Reduced consumption of goods/services
- Bought less food
- Sold Assets (e.g. car, appliances, furniture)
- Used cash savings
- Received money from friends/relatives
- Received money from government (e.g. grant)
- Got a loan
- Stopped paying school feels
- Sold my business
- Left my family
- Took up (more) insurance
- Started putting more money aside every month
- Joined a stokvel
- Took out a funeral plan
- Opened a bank account
- Started using a mobile money service (e.g. eWallet, Wizzit, MTN Mobile Money, Mpesa)
- Started having a financial advisor
- Stopped spending money on my house
- Other (specify)

- Did not do anything

The complete list of variables (with questions) is included in Appendix A: Questionnaire and Variables List.

## Limitations: Budget and Time Considerations

Due to time and budget constraints, this is a cross-sectional study. A longitudinal research with a follow-up survey to be conducted in 6 to 12 months time would have allowed us to measure progress in adoption of specific mobile money products and technology and eventual improvements in respondents savings behavior, but it is unfortunately beyond the budget and time limitations of this research.

Although a survey is usually a time consuming exercise, today's organizations and research companies use technology at their advantage in order to bring down times and costs. For example, (ikapadata, 2012) runs a bi-weekly survey in townships claiming very quick turnaround times and cost efficiency: *"The omnibus survey is our most immediate and cost-efficient way of collecting data in townships - there are no set-up costs involved and we can guarantee 1000 responses in the space of four weeks from township residents in Johannesburg, Cape Town and Durban on a fixed price per question basis."* (Source: email correspondence with ikapadata.com).

The questionnaire has been formatted to be executed on Android mobile phones instead than pen and paper, thereby sensibly reducing data collection time and costs. Data are then immediately uploaded from the collection devices to computers and are immediately available to start data analysis.

In order to ensure a significant response rate and minimize language bias, the questionnaire has been translated in local language (isiXhosa). An airtime voucher has been transmitted by SMS to survey participants in order to compensate them.

# 5. Data Analysis

In the paragraphs below we will present the results of our analysis. After discussing the descriptive statistics, we will show some statistics relating the cellphone usage, take-up of Mobile Money products as an alternative savings instrument, what these products are used for and how they are perceived. We will then turn to the main objective of our study, savings behavior and shock-coping behavior of the households we interviewed. These include how and why households save, what are the major events that affect their behavior, what do they do to cope with financial shocks. We introduce a variable *strategy* that recodes behaviors in order to distinguish between "optimal" and "sub-optimal" strategies adopted when facing with unexpected events. All results are grouped around some focal analysis "themes" that we found affect households behavior: these are approach to life, education level, and employment status.

## Descriptive Statistics

Below some descriptive statistics relating the households and respondents. Data have been compared to SA Census 2011 results (Statistics South Africa, 2011).

### Household Info

- Number of Children per household: 23% with no children, 26% with 1 child, 50% with two or more children. The South African average is 1.25 children per household.
- Dwelling: 71% in a brick dwelling, 34% under iron roof

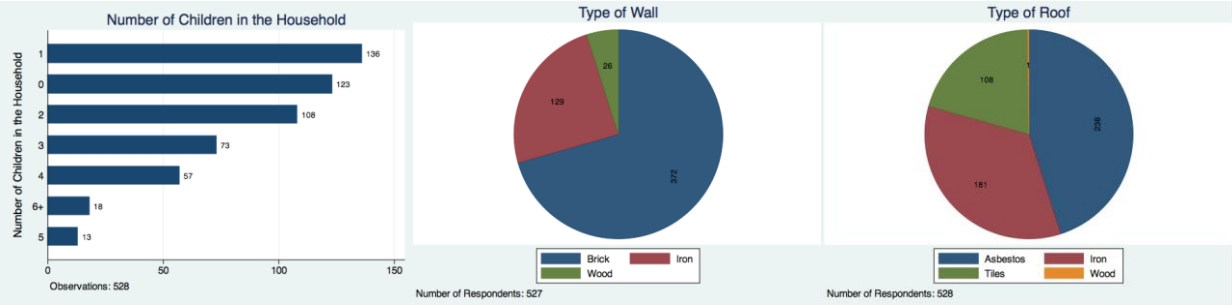



*Figure 3: Household Descriptive Statistics*

### Respondent Info

- Age: 62% below 40, versus an SA average of 73%.
- Gender: 54% females (Census: 51.35%)

- Employment: 60% unemployed. The census data distinguished between "unemployed", "discouraged work-seeker", and "other not economically active", and by grouping these 3 categories we get 40%. Our percentage is higher as we have excluded from the interviews respondents less than 18 years old. The SA census data inserts them in a category called "not applicable" that makes 34.5% of the population.
- Marital status: 45.4% never-married, 41.6% married or living as married (Census: 65% never married, 30% married or living as married)
- Education: 42% with at least grade 9, 25% matriculated, 10% with tertiary education (Census: 28.15% "some secondary", 18% matriculated, 7% tertiary). Our percentages are slightly higher as again we have only interviewed respondents aged more than 18.

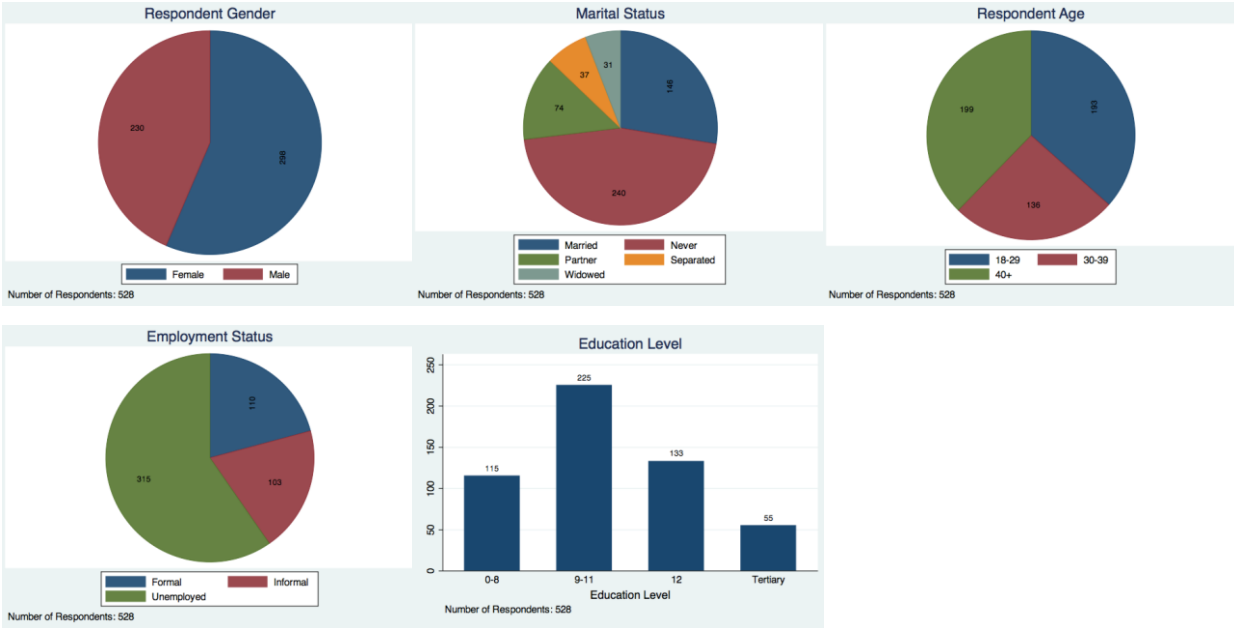



*Figure 4: Respondent Descriptive Statistics*

Most respondents live in a brick dwelling, without significant differences per employment status. A high percentage of unemployed (67%) live under asbestos roof vs. 45% for the whole sample, suggesting a more "informal settlement" type of dwelling.

**Dwelling /Employment Status**

| | **Employment Status** | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Type of Wall** | Formal | | Informal | | Unemployed | | Total | |
| | % | N | % | N | % | N | % | N |
| Brick | 71% | 78 | 61% | 62 | 74% | 232 | 71% | 372 |
| Iron | 24% | 26 | 33% | 34 | 22% | 69 | 24% | 129 |
| Wood | 5% | 6 | 6% | 6 | 4% | 14 | 5% | 26 |
| Total | 100% | 110 | 100% | 102 | 100% | 315 | 100% | 527 |

Pearson chi2(4) = 6.3600 Pr = 0.174

| | Type of Roof | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Employment Status** | Asbestos | | Iron | | Tiles | | Wood | | Total | |
| | % | N | % | N | % | N | % | N | % | N |
| Formal | 18% | 44 | 20% | 36 | 27% | 29 | 100% | 1 | 21% | 110 |
| Informal | 15% | 35 | 28% | 50 | 17% | 18 | 0% | 0 | 20% | 103 |
| Unemployed | 67% | 159 | 52% | 95 | 56% | 61 | 0% | 0 | 60% | 315 |
| Total | 100% | 238 | 100% | 181 | 100% | 108 | 100% | 1 | 100% | 528 |

Pearson chi2(6) = 19.5383 Pr = 0.003

*Table 3: Household by Employment Status*

## Mobile Phone and Mobile Money Usage

Cellphone Usage: mostly for calls, messaging, and airtime. Low usage of internet and mobile money (16% of respondent using a phone)

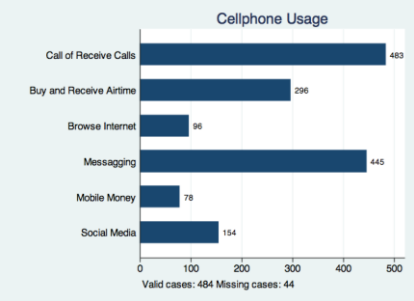



*Figure 5: Cellphone Usage*

## Demographics

The graphs below show demographics of the Mobile Money users: while the percentages are similar for gender, employment and marital status, Mobile Money users are more educated (more matriculated and with tertiary education) and younger (below 40).

- There is a majority of female users (55%), similar to our sample demographics (54%)
- Most users are under 40 (76%) versus a 62% of under 40s in the sample
- 56% not married vs 59% in the sample
- 46% matriculates vs 34% in the whole sample
- 27% have tertiary education vs 13% of the whole sample

- 58% unemployed vs 60% in the whole sample

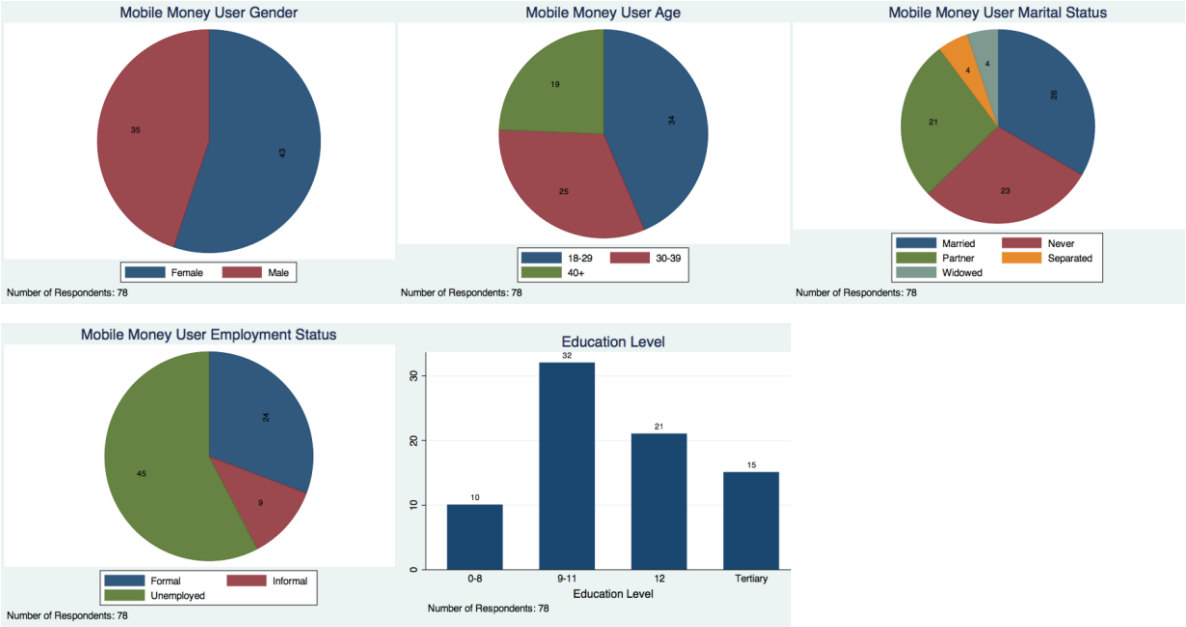



*Figure 6: Mobile Money Users Demographics*

## Usage of Mobile Money

Below graphs reporting usage of MM services, frequency of usage and frequency of savings.

- Service used: FNB most popular (44%), followed by MTN (13%)
- Frequency of Usage: Very low, with almost half of respondents saying they use it only once a month. This makes perfect sense in all cases where income is paid monthly or the target is to put aside a predetermined amount every month.
- Frequency of Savings: Lower, with 65% claiming saving only once a month
- Balance at the end of the month: Surprisingly high, with 45% indicating the balance at month end is higher than R500. 40% indicated the MM account helps them save more than R500/month.
- Perception of Saving more: 84% responded yes
- Perception of Saving more often: 90%


*Figure 7: Mobile Money Usage*

## Saving using a Mobile Money account

- 50% of MM users say it helped them save more than R100/month
- Best features appreciated: Usability (38%) and Saving capability (24%). Safety also very appreciated

The table below shows that females are predominant savers in the lower brackets of up R500 per month, while males save more in the R501 to R1000 bracket (33% vs 12%) and in the highest category. The rank-sum tests shows a significant difference between males and females of z=-2.454 (categories were coded from 1 to 5).

| | Gender | | | | | |
|---|---|---|---|---|---|---|
| **Monthly Savings on Mobile Money Account** | Female | | Male | | Total | |
| | % | N | % | N | % | N |
| Less Than R100 | 18% | 3 | 0% | 0 | 10% | 3 |
| R101 To R200 | 18% | 3 | 8% | 1 | 14% | 4 |
| R201 To R500 | 24% | 4 | 0% | 0 | 14% | 4 |
| R501 To R1000 | 12% | 2 | 33% | 4 | 21% | 6 |
| More Than R1000 | 24% | 4 | 25% | 3 | 24% | 7 |
| Refuse | 6% | 1 | 33% | 4 | 17% | 5 |
| Total | 100% | 17 | 100% | 12 | 100% | 29 |

Pearson chi2(5) = 10.0461 Pr = 0.074

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

| gender | obs | rank sum | expected |
|---|---|---|---|
| Female | 17 | 200.5 | 255 |
| Male | 12 | 234.5 | 180 |
| combined | 29 | 435 | 435 |

unadjusted variance 510.00
adjustment for ties -16.96
adjusted variance 493.04
Ho: month(gender==Female) = month(gender==Male)
z = -2.454
Prob > |z| = 0.0141

*Table 4: Monthly Savings on Mobile Money Account by Gender*

The table shows a much higher saving rate among formally or informally unemployed especially in the medium-to-high brackets like from R201 to R500, and from R501 to R1000. The relationship between the variables is not statistically significant.

| | Employment Status | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Monthly Savings on Mobile Money Account** | Formal | | Informal | | Unemployed | | Total | |
| | % | N | % | N | % | N | % | N |
| Less Than R100 | 0% | 0 | 17% | 1 | 17% | 2 | 10% | 3 |
| R101 To R200 | 9% | 1 | 17% | 1 | 17% | 2 | 14% | 4 |
| R201 To R500 | 0% | 0 | 33% | 2 | 17% | 2 | 14% | 4 |
| R501 To R1000 | 45% | 5 | 0% | 0 | 8% | 1 | 21% | 6 |
| More Than R1000 | 18% | 2 | 17% | 1 | 33% | 4 | 24% | 7 |
| Refuse | 27% | 3 | 17% | 1 | 8% | 1 | 17% | 5 |
| Total | 100% | 11 | 100% | 6 | 100% | 12 | 100% | 29 |

Pearson chi2(10) = 12.6713 Pr = 0.243

*Table 5: Monthly Savings using Mobile Money by Employment*

The table below shows that 10% of respondents who have already passed at least grade 8 use a mobile money account, increasing to 16% for respondents with at least grade 9, and to 28% for those who have tertiary education The relationship between the variables is statistically significant.

**Education Level**

| **Mobile Money Usage** | 0-8 | | 9-11 | | 12 | | Tertiary | | Total | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| | % | N | % | N | % | N | % | N | % | N |
| Do Not Use Mobile Money | 90% | 88 | 84% | 172 | 84% | 107 | 72% | 39 | 84% | 406 |
| Uses MM | 10% | 10 | 16% | 32 | 16% | 21 | 28% | 15 | 16% | 78 |
| Total | 100% | 98 | 100% | 204 | 100% | 128 | 100% | 54 | 100% | 484 |

Pearson chi2(3) = 8.0020 Pr = 0.046

*Table 6: Monthly Savings using Mobile Money by Education Level*

## Mobile Money Awareness

- 43% admits they never heard of any Mobile Money product
- 65% of those not using it indicated they are planning to use MM in the future
- They see usability and safety as the most attractive features
- Reasons for not using MM: Risk/Safety

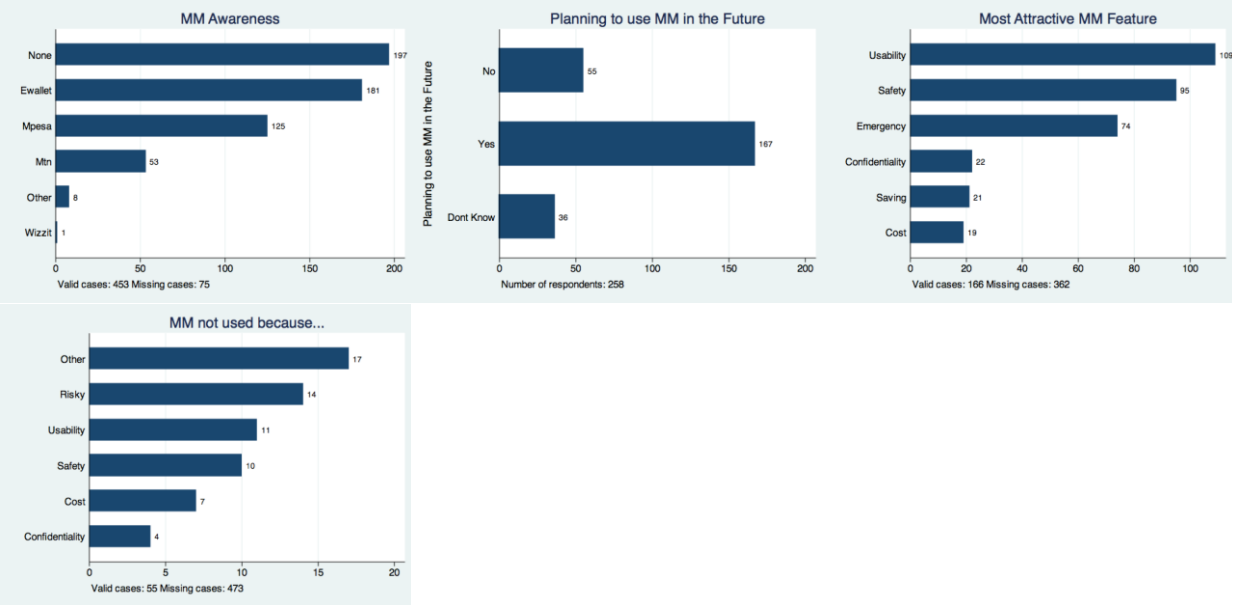



*Figure 8: Mobile Money Awareness*

## Savings Behavior

The data below shows what savings are used for, why do people save and which are the main savings methods employed. Data are compared to a national survey run by the FinMark Trust (FinMark Trust, 2012).

- Savings are mainly used for: paying bills, buying furniture/appliances, on the house
- What do you save for: Emergencies, School Feels, Future Education, Funerals

- Most Popular Savings method: Bank (80%), Stokvel (33%), Funeral Plan (31%), Cash in a safe place (21%). Data from a national survey from the FinMark Trust of the adult population in South Africa (16 years and older) confirms that 67% of the population is banked, burial and funeral cover dominates insurance and stokvels and "savings club" are widely adopted forms of savings especially among those who use only informal savings or mix formal and informal ones.

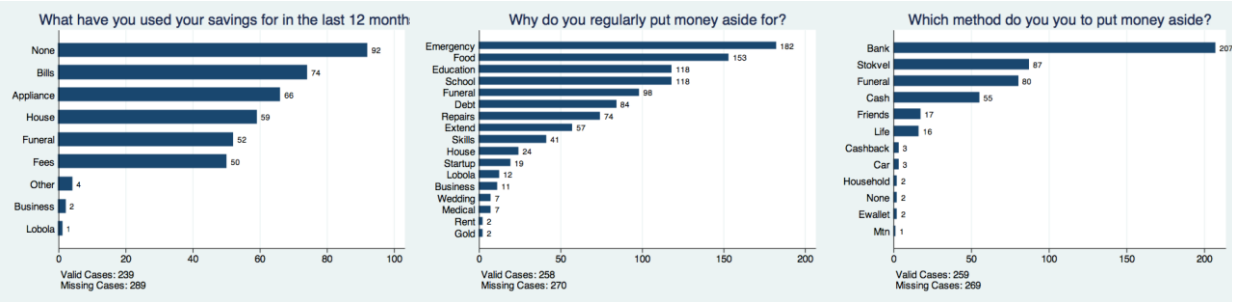



*Figure 9: Savings Behavior: What, Why, How*

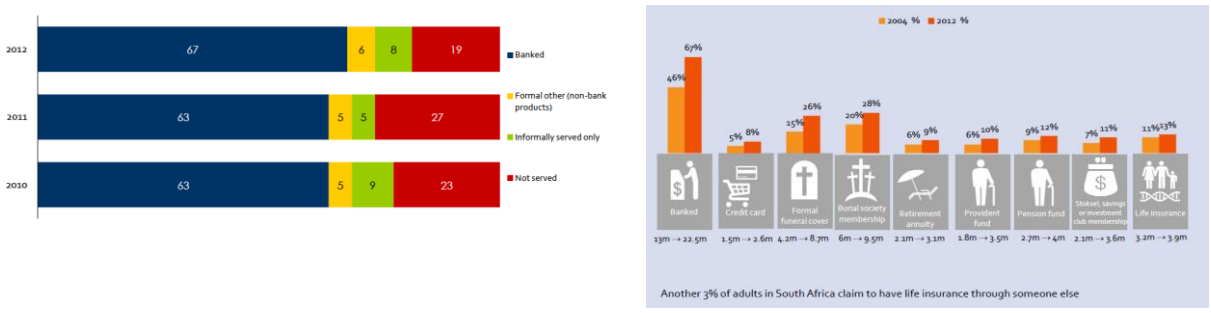



*Figure 10: FinMark Trust Survey on Savings*

## Small Savers and Big Savers

Only 11% declares to be saving less than R100/month, while 18% refused to respond; 23% save between R101-200, 27% between R201-R500, and 20% save more than R500 per month. We have split the respondents in two categories named "Big Savers" (the ones who save more than R500/month) and small savers and run correlations tests with the different savings methods. The table below shows that the highest percentage of big savers uses

insurance as preferred method (46%) rather than a bank account (27%), while small savers rely more on the bank or putting the cash in a safe place.


*Figure 11: Monthly Savings*

**Bank Account**

| **Savers Type** | No % | No N | Yes % | Yes N | Total % | Total N |
|---|---|---|---|---|---|---|
| Small Savers <500/month | 84% | 36 | 73% | 125 | 75% | 161 |
| Big Savers >500/month | 16% | 7 | 27% | 46 | 25% | 53 |
| Total | 100% | 43 | 100% | 171 | 100% | 214 |

Pearson chi2(1) = 2.0804 Pr = 0.149

**Cash in a Safe Place**

| Savers Type | No % | No N | Yes % | Yes N | Total % | Total N |
|---|---|---|---|---|---|---|
| Small Savers <500/month | 76% | 122 | 72% | 39 | 75% | 161 |
| Big Savers >500/month | 24% | 38 | 28% | 15 | 25% | 53 |
| Total | 100% | 160 | 100% | 54 | 100% | 214 |

Pearson chi2(1) = 0.3515 Pr = 0.553

**Stokvel**

| Savers Type | No % | No N | Yes % | Yes N | Total % | Total N |
|---|---|---|---|---|---|---|
| Small Savers <500/month | 81% | 109 | 66% | 52 | 75% | 161 |
| Big Savers >500/month | 19% | 26 | 34% | 27 | 25% | 53 |
| Total | 100% | 135 | 100% | 79 | 100% | 214 |

Pearson chi2(1) = 5.9524 Pr = 0.015

**Insurance**

| Savers Type | 0 % | 0 N | 1 % | 1 N | Total % | Total N |
|---|---|---|---|---|---|---|
| Small Savers <500/month | 77% | 150 | 55% | 11 | 75% | 161 |
| Big Savers >500/month | 23% | 44 | 45% | 9 | 25% | 53 |
| Total | 100% | 194 | 100% | 20 | 100% | 214 |

Pearson chi2(1) = 4.8475 Pr = 0.028

**Funeral Plan**

| Savers Type | No % | No N | Yes % | Yes N | Total % | Total N |
|---|---|---|---|---|---|---|
| Small Savers <500/month | 77% | 106 | 72% | 55 | 75% | 161 |
| Big Savers >500/month | 23% | 32 | 28% | 21 | 25% | 53 |
| Total | 100% | 138 | 100% | 76 | 100% | 214 |

Pearson chi2(1) = 0.5193 Pr = 0.471

**Mobile Money**

| Savers Type | 0 % | 0 N | 1 % | 1 N | Total % | Total N |
|---|---|---|---|---|---|---|
| Small Savers <500/month | 75% | 159 | 67% | 2 | 75% | 161 |
| Big Savers >500/month | 25% | 52 | 33% | 1 | 25% | 53 |
| Total | 100% | 211 | 100% | 3 | 100% | 214 |

Pearson chi2(1) = 0.1198 Pr = 0.729

*Table 7: Monthly Savings by Method*

## Savings Behavior by Gender

The table below shows that females save more in the lower brackets, for example 31% of female declare they save between R101 and R200 opposed to 15% of males. 29 % of males declare to save in the R200-R500 bracket 29% compared to 25% of females. 5% of males declare they save more than R1000 opposed to 3% of females. The relationship between the variables is statistically significant. The rank-sum test shows there is a significant difference between males and females of z=-2.730 (the categories were coded from 1 to 5).

**Amount saved every month by Gender**

| Amount Saved | Gender: Female % | Female N | Male % | Male N | Total % | Total N |
|---|---|---|---|---|---|---|
| Less Than R100 | 15% | 21 | 7% | 9 | 11% | 30 |
| R101 To R200 | 31% | 42 | 15% | 19 | 23% | 61 |
| R201 To R500 | 25% | 34 | 29% | 37 | 27% | 71 |
| R501 To R1000 | 16% | 22 | 17% | 21 | 16% | 43 |
| More Than R1000 | 3% | 4 | 5% | 6 | 4% | 10 |
| Refuse | 10% | 13 | 27% | 34 | 18% | 47 |
| Total | 100% | 136 | 100% | 126 | 100% | 262 |

Pearson chi2(5) = 23.0570 Pr = 0.000

Refused been coded same as missing

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

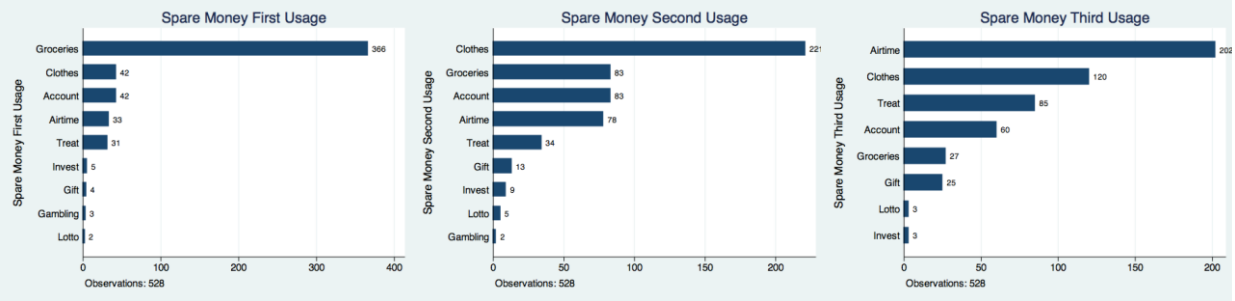
| gender | obs | rank sum | expected |
|---|---|---|---|
| Female | 123 | 12095.5 | 13284 |
| Male | 92 | 11124.5 | 9936 |
| combined | 215 | 23220 | 23220 |

unadjusted variance 203688.00
adjustment for ties -14186.69
adjusted variance 189501.31
Ho: amount(gender==Female) = amount(gender==Male)
z = -2.730
Prob > |z| = 0.0063

*Table 8: Monthly Savings by Gender*

## Usage of Spare Money

Spare money usages: Groceries by large the first one as indicated by 366 respondents pout 528 (69%) of respondents, Clothes tops the list of the second usage of spare money for 42% of respondents, followed by airtime as third usage for 38% of respondents.



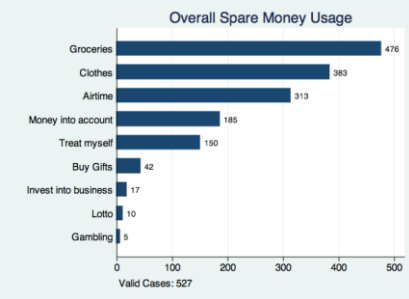
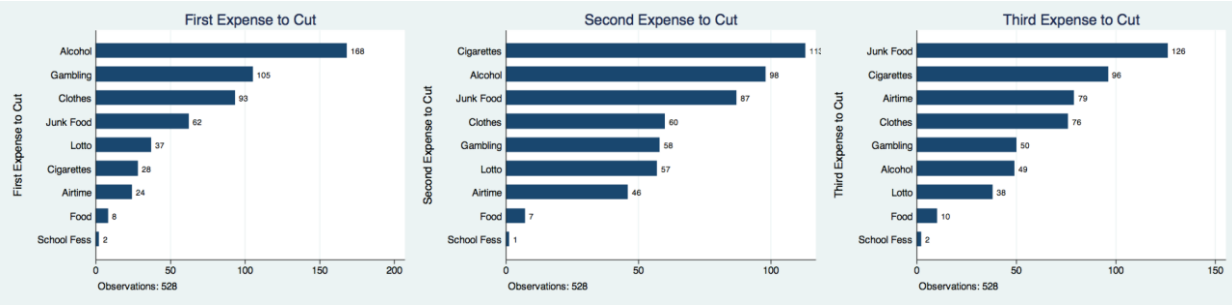



*Figure 12: Usage of Spare Money*

Overall 476 out of 527 respondents (90%) indicated that buying groceries are one of the three first usages of spare money, followed by clothes (72%) and airtime (59%)

## Cutting Expenses

Expenses that are Cut first: according to 32% of respondents alcohol tops the list, while 21% thinks that tobacco is the expense to cut second, and junk food to be cut third for 24% of respondents.



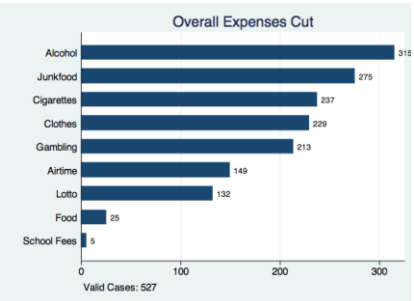




*Figure 13: How expenses are cut*

Overall 315 out of 527 (60%) respondents indicated that alcohol is one the three first expenses they cut, followed by junk food (52%) and cigarettes (45%)

## Shock Coping Behavior

### Shocks

Shocks experienced in the last 12 months: steep rise of food prices (45%), loss of job (32%) and illness/accident (25%). We note that "Steep rise of food prices", although is top of the list is more like a continual phenomenon rather than a shock, and one that features very often in all the media, therefore reflecting in people perceptions.

Shock Coping Behavior: did nothing (39%), reduced food consumption (31%), used cash savings (26%)

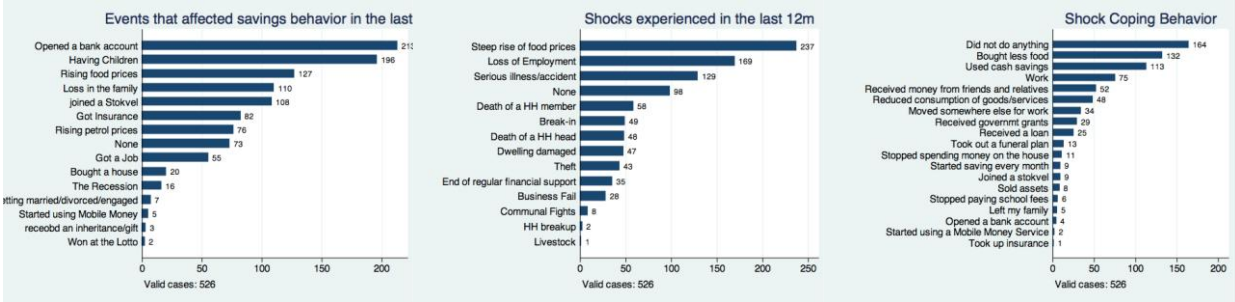



*Figure 14: Adverse Events and Shock-Coping Behavior*

### Strategy

We have recoded the shock coping behavior to distinguish between three strategies, Optimal, Sub-optimal and Neutral, where a strategy is considered "Optimal" is there is majority of "good" behaviors vs not-so-good behaviors. In particular good behavior includes:

- Opening a bank account
- Getting a funeral plan
- Joining a stokvel
- Getting insurance
- Opening a mobile money account

- Use cash savings
- Getting a loan
- Receive money from friends and relatives
- Receive money from government
- Saving more each month
- Work more

Not-so-good behavior includes:

- Selling assets
- Stop paying school fees
- Buying less food
- Stop spending money on the house
- Leaving the family
- Moving somewhere else to look for work
- Reduce consumption of goods and services
- Doing nothing

We found that 57% of households adopted a “sub-optimal” strategy while 31% adopted an “optimal” strategy, with the rest adopting a “neutral” strategy where the number of good behaviors equals the number of less optimal ones.

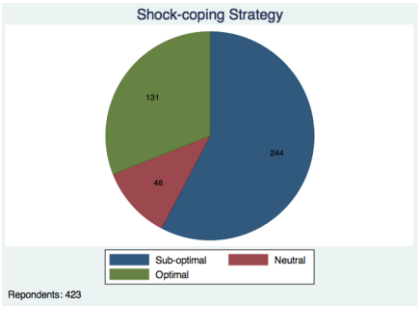



*Figure 15: Shock-Coping Behavior Strategy*

We have seen from the table above events that affected spending behavior in the last 12 months, where opening a bank account and having children are predominant. However it is important to distinguish between events that have been initiated by the respondent or on which the respondent has full control like opening a bank account, joining a stokvel, getting insurance as opposed to external events that are non-controllable or less-controllable like rising food prices, having children, having a loss in the family. For this purpose we created two variables *event_intentional* and *event_unintentional* grouping together the related events and we run a chi-square test to verify that intentional events are as significant in affecting savings behavior as unintentional events. The results the table below show that intentional events are much more significant in affecting savings behavior than unintentional events:

| | **event_intentional** | | | | | |
|---|---|---|---|---|---|---|
| **Strategy** | 0 | | 1 | | Total | |
| | % | N | % | N | % | N |
| Sub-optimal | 66% | 123 | 51% | 121 | 58% | 244 |
| Neutral | 12% | 23 | 11% | 25 | 11% | 48 |
| Optimal | 22% | 41 | 38% | 90 | 31% | 131 |
| Total | 100% | 187 | 100% | 236 | 100% | 423 |
| Pearson chi2(2) = 12.9253 Pr = 0.002 | | | | | | |

| | **event_unintentional** | | | | | |
|---|---|---|---|---|---|---|
| **Strategy** | 0 | | 1 | | Total | |
| | % | N | % | N | % | N |
| Sub-optimal | 55% | 65 | 59% | 179 | 58% | 244 |
| Neutral | 8% | 10 | 12% | 38 | 11% | 48 |
| Optimal | 37% | 44 | 29% | 87 | 31% | 131 |
| Total | 100% | 119 | 100% | 304 | 100% | 423 |
| Pearson chi2(2) = 3.4622 Pr = 0.177 | | | | | | |

*Table 9: Shock Coping Beahvior and Intentional/Unintentional Events*

In the next paragraphs we will show of correlations tests between shock-coping behavior and other variables around some focal analysis "themes" that we found affect households behavior: these are approach to life, education level, and employment status. We also found relevant to this analysis monthly savings, savings method and perceived financial situation of the household.

## Household Perceived Financial Situation

Respondents have been asked in a likert-scale whether they agree that the situation of their household is financially safe and how the security of the finances of the household is perceived from "insufficient" to "comfortable".

Perceived Security with the financial situation of the household in a likert scale: 51% does not feel financially safe, only 33% thinks they are somehow safe

Perceived Description of the financial situation of the household: 54% describes it as insufficient, 29% say they can meet only basic needs. Only 17% thinks its either "providing for some extras" or it is "comfortable", while in the FinMark Trust survey (FinMark Trust, 2012), 25% claims they can save some money after providing for basic needs.

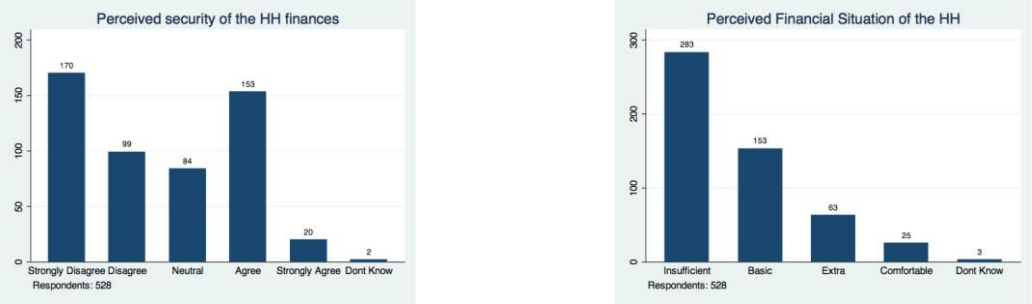



*Figure 16: Perceived Financial Situation and Security of the Household*

## Strategy vs. Household Perceived Financial Situation

28% of respondents who declared their financial situation is "insufficient" adopted an optimal strategy versus 33% of those ones who declared they "meet only basic expenses", and 40% of those who either are "left with a bit of extra money" or "feel comfortable". The relationship between strategy and perceived financial situation is not statistically significant.

**Strategy vs Perceived Financial situation**

| | Perceived Financial Situation | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Strategy | Insufficient | | Basic | | Extra/Comfortable | | Total | Total |
| | % | N | % | N | % | N | % | N |
| Sub-optimal | 59% | 141 | 59% | 73 | 51% | 29 | 58% | 243 |
| Neutral | 13% | 32 | 8% | 10 | 9% | 5 | 11% | 47 |
| Optimal | 28% | 68 | 33% | 40 | 40% | 23 | 31% | 131 |
| Total | 100% | 241 | 100% | 123 | 100% | 57 | 100% | 421 |

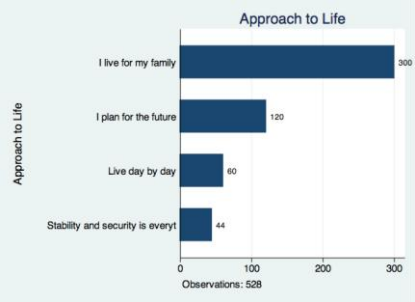
Pearson chi2(4) = 5.1075 Pr = 0.276

*Table 10: Strategy vs. Perceived Financial Situation*

## Approach to Life

The respondents were asked to choose their "approach to life" from a ordered list ranging from "I live only for now" and "I live on day to day" to "I plan for the future" and "Security is everything". A large majority declares a "conservative" approach, indicating they are family oriented or plan for the future as opposed to living on a day-to-day basis and thinking

only for themselves. Similarly, in the spending vs save attitude 67% declares to be incline to save rather than spend.



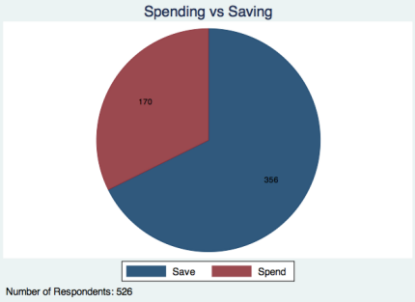




*Figure 17: Approach to Life*

The tables below show the results of correlations tests between variable representing the respondent "approach to life" and the perceived financial situation of the household.

The table below shows that 89% of respondents who declare themselves more incline to "spend" think their household financial situation is either "insufficient" of allows to "meet only basic needs", versus 80% of the respondents who declare themselves more incline to "save". Similarly 17% of the "spenders" ones think the household financial situation allows to "provide for some extra needs" or is "comfortable" versus 20% of the "savers" think so. This explains that as savers tend to put aside spare money as opposed to spend it, they tend to have a better perception of their financial situation and think they can cater for some "extra needs" as opposed to "basic needs". Similarly a "spender" will tend to think he's always short of funds. The relationship between the variables is statistically significant. The output of the two-sample Wilcoxon rank-sum test shows there is a significant difference between "savers" and "spenders" of z=3.291 (the categories were coded from 1 to 4).

| **Perceived Financial Situation vs SpendvsSave Attitude** | **SpendvsSave Attitude** | | | | | |
|---|---|---|---|---|---|---|
| **Perceived Financial Situation** | Save | | Spend | | Total | |
| | % | N | % | N | % | N |
| Insufficient | 49% | 173 | 64% | 108 | 54% | 281 |
| Basic | 31% | 111 | 25% | 42 | 29% | 153 |
| Extra | 14% | 49 | 8% | 14 | 12% | 63 |
| Comfortable | 6% | 20 | 3% | 5 | 5% | 25 |
| Dont Know | 1% | 2 | 1% | 1 | 1% | 3 |
| Total | 100% | 355 | 100% | 170 | 100% | 525 |
| Pearson chi2(4) = 11.1215 Pr = 0.025 | | | | | | |

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

| spendvssave | obs | rank sum | expected |
|---|---|---|---|
| Save | 355 | 98213 | 93365 |
| Spend | 170 | 39862 | 44710 |
| combined | 525 | 138075 | 138075 |

unadjusted variance 2645341.67
adjustment for ties -475948.05
adjusted variance 2169393.62
Ho: situat~n(spendv~e==Save) = situat~n(spendv~e==Spend)
z = 3.291
Prob > |z| = 0.0010

*Table 11: Perceived Financial Situation vs. Spend/Save Attitude*

The table below shows that the perceived financial situation of the household is "insufficient" for 63% those who declare they "live on a day to day basis" and 60% of the "family oriented" ones, while it is better among those who "plan for the future" (only 38%) or think "security is a priority" (only 42% think its insufficient). Similarly, only 10% among those who live by the day think they are in a comfortable situation or in one that allows to provide for some extras, as opposed to 24% of those think for the future or 26% of those who worry about security. This indicates again that respondents who don't worry about their future or their family have a negative perception of the financial situation of their household, similarly to what we found in the tables above relatiing to "spenders". The "family oriented" responders also have a negative perception that reflects their worries about having to take care of the family besides themselves. Good perception comes from respondents that "plan for the future" or care about "stability and security", similarly to what we found for "spenders" above.

The relationship between the variables is statistically significant.

**Perceived Financial Situation vs Approach to Life**

| | **Approach to Life** | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Financial Situation** | Day by Day | | Plan Future | | Stability and security | | Family Oriented | | Total | Total |
| | % | N | % | N | % | N | % | N | % | N |
| Insufficient | 63% | 38 | 38% | 45 | 42% | 18 | 60% | 180 | 54% | 281 |
| Basic | 25% | 15 | 37% | 44 | 33% | 14 | 26% | 78 | 29% | 151 |
| Extra | 5% | 3 | 18% | 22 | 19% | 8 | 10% | 30 | 12% | 63 |
| Comfortable | 5% | 3 | 6% | 7 | 7% | 3 | 4% | 12 | 5% | 25 |
| Dont Know | 2% | 1 | 2% | 2 | 0% | 0 | 0% | 0 | 1% | 3 |
| Total | 100% | 60 | 100% | 120 | 100% | 43 | 100% | 300 | 100% | 523 |

Pearson chi2(12) = 29.9381 Pr = 0.003

*Table 12: Perceived Financial Situation vs. Approach to Life*

The table below shows compares spenders and savers relating the perceived financial security of their household. It shows that 34% of saves agree that the household is financially secure, opposed to 31% of spenders. Also 49% of savers disagree on the statement, opposed to 55% of the spenders. The relationship between the two variables is statistically significant. The output of the two-sample Wilcoxon rank-sum test shows there is a significant difference between "savers" and "spenders" of z=2.398 (the categories were coded from 1 to 5).

| Security vs Save/Spending Attitude | SpendvsSave Attitude | | | | | |
|---|---|---|---|---|---|---|
| Financial Security of the Household | Save | | Spend | | Total | |
| | % | N | % | N | % | N |
| Strongly Disagree | 26% | 91 | 45% | 77 | 32% | 168 |
| Disagree | 23% | 82 | 10% | 17 | 19% | 99 |
| Neutral | 17% | 62 | 13% | 22 | 16% | 84 |
| Agree | 31% | 109 | 26% | 44 | 29% | 153 |
| Strongly Agree | 3% | 12 | 5% | 8 | 4% | 20 |
| Dont Know | 0% | 0 | 1% | 2 | 0% | 2 |
| Total | 100% | 356 | 100% | 170 | 100% | 526 |

Pearson chi2(5) = 31.4684 Pr = 0.000

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

| spendvssave | obs | rank sum | expected |
|---|---|---|---|
| Save | 356 | 97580.5 | 93806 |
| Spend | 170 | 41020.5 | 44795 |
| combined | 526 | 138601 | 138601 |

unadjusted variance 2657836.67
adjustment for ties -180688.74
adjusted variance 2477147.92
Ho: security(spendv~e==Save) = security(spendv~e==Spend)
z = 2.398
Prob > |z| = 0.0165

*Table 13: Perceived Financial Security vs. Spend/Save Attitude*

The table below shows that 50% of those who declare to live "day by day" do not agree they feel secure about their financial situation. The percentage decreases to 41% for those who "think for the future". Again the family oriented respondents show a more negative perception (53%) driven by concern for the rest of the family besides themselves. The relationship between the two variables is statistically significant.

| Financial Security vs Approach to Life | Approach to Life | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Financial Security of the Household | Day by Day | | Future | | Stability and Security | | Family oriented | | Total | |
| | % | N | % | N | % | N | % | N | % | N |
| Strongly Disagree | 42% | 52 | 14% | 17 | 20% | 9 | 39% | 117 | 32% | 168 |
| Disagree | 8% | 5 | 27% | 32 | 41% | 18 | 14% | 43 | 19% | 98 |
| Neutral | 13% | 8 | 15% | 18 | 11% | 5 | 17% | 52 | 16% | 83 |
| Agree | 30% | 18 | 44% | 53 | 25% | 11 | 24% | 71 | 29% | 153 |
| Strongly Agree | 5% | 3 | 0% | 0 | 2% | 1 | 5% | 16 | 4% | 20 |
| Dont Know | 2% | 1 | 0% | 0 | 0% | 0 | 0% | 1 | 0% | 2 |
| Total | 100% | 60 | 100% | 120 | 100% | 44 | 100% | 300 | 100% | 524 |

Pearson chi2(15) = 66.2728 Pr = 0.000

*Table 14: Perceived Financial Security vs. Approach to Life*

## Strategy vs Approach to Life

57% of respondents who declare themselves more incline to "save" employed a sub-optimal strategy, while 32% employed an optimal strategy. Instead 59% of respondents with a "spend" propensity employed a sub-optimal strategy while 28% employed an optimal strategy. The relationship between shock coping behavior and spendvssave attitude is not statistically significant.

**Shock Coping Behavior Strategy by SpendvsSave Attitude**

| | SpevdvsSave Attitude | | | | | |
|---|---|---|---|---|---|---|
| **Strategy** | Save | | Spend | | Total | |
| | % | N | % | N | % | N |
| Sub-optimal | 57% | 165 | 59% | 79 | 58% | 244 |
| Neutral | 10% | 30 | 13% | 18 | 11% | 48 |
| Optimal | 32% | 93 | 28% | 37 | 31% | 130 |
| Total | 100% | 288 | 100% | 134 | 100% | 422 |

Pearson chi2(2) = 1.4253 Pr = 0.490

*Table 15: Strategy vs Spend/Save Attitude*

Optimal strategies are less frequent on the left-hand side of the table, while they grow for respondents with a more conservative approach to life. In particular 40% of respondents who declared "security is everything" adopted an optimal strategy. Optimal strategy adoption is lowest among respondents who declared to live "day by day". The relationship between shock coping behavior and approach to life attitude is not statistically significant.

**Shock Coping Behavior Strategy by Approach to Life**

| | Approach to Life | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Strategy** | Live day by day | | I plan for the future | | Stability and security is everything | | I live for my family | | Total | Total |
| | % | N | % | N | % | N | % | N | % | N |
| Sub-optimal | 56% | 27 | 64% | 58 | 57% | 20 | 55% | 137 | 58% | 242 |
| Neutral | 21% | 10 | 11% | 10 | 3% | 1 | 11% | 27 | 11% | 48 |
| Optimal | 23% | 11 | 24% | 22 | 40% | 14 | 34% | 83 | 31% | 130 |
| Total | 100% | 48 | 100% | 90 | 100% | 35 | 100% | 247 | 100% | 420 |

Pearson chi2(6) = 10.6890 Pr = 0.098

*Table 16: Strategy vs Approach to Life*

## Education

Below we see how education level affects the perceived financial situation of the household: 94% of respondent who completed up to grade 8 indicated that their financial situation is either "insufficient" or "allows to meet only basic needs", with the percentage decreasing slowly for respondents who completed grade 9 to 11, down to 74% for those who completed grade 12 and 71% for those who have tertiary education. Only 14% of those who completed grade 9 to 12 feel they can "provide for some extra needs" or feel "comfortable" about the financial situation of the household. The relationship between the variables is statistically significant.

**Perceived Financial Situation vs Education**

| | Education Level | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Financial Situation** | 0-8 | | 9-11 | | 12 | | Tertiary | | Total | |
| | % | N | % | N | % | N | % | N | % | N |
| Insufficient | 73% | 84 | 56% | 127 | 40% | 53 | 35% | 19 | 54% | 283 |
| Basic | 21% | 24 | 28% | 64 | 34% | 45 | 36% | 20 | 29% | 153 |
| Extra | 5% | 6 | 10% | 22 | 20% | 27 | 15% | 8 | 12% | 63 |
| Comfortable | 1% | 1 | 4% | 10 | 5% | 7 | 13% | 7 | 5% | 25 |
| Dont Know | 0% | 0 | 1% | 2 | 0% | 0 | 2% | 1 | 1% | 3 |
| Total | 100% | 115 | 100% | 225 | 100% | 132 | 100% | 55 | 100% | 527 |

Pearson chi2(12) = 49.4656 Pr = 0.000

*Table 17: Perceived Financial Situation vs Education*

Below we can see how education level affects monthly savings: the largest percentage of savers in the lowest bracket (less than R200/month) belongs to 0-8 education level, while if we look at higher brackets (between R200 and R1000) we find 50% of those who have grade 9 to 11, 53% of matriculated and 64% of those with tertiary education. The relationship between the variables is not statistically significant.

**Amount saved every month by Education**

| | Education Level | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Amount Saved Monthly** | 0-8 | | 9-11 | | 12 | | Tertiary | | Total | |
| | % | N | % | N | % | N | % | N | % | N |
| Less Than R100 | 7% | 2 | 21% | 19 | 9% | 6 | 11% | 3 | 14% | 30 |
| R101 To R200 | 44% | 12 | 23% | 21 | 33% | 23 | 18% | 5 | 28% | 61 |
| R201 To R500 | 26% | 7 | 34% | 31 | 30% | 21 | 43% | 12 | 33% | 71 |
| R501 To R1000 | 22% | 6 | 16% | 15 | 23% | 16 | 21% | 6 | 20% | 43 |
| More Than R1000 | 0% | 0 | 5% | 5 | 4% | 3 | 7% | 2 | 5% | 10 |
| Total | 100% | 27 | 100% | 91 | 100% | 69 | 100% | 28 | 100% | 215 |

Pearson chi2(12) = 14.7749 Pr = 0.254

*Table 18: Monthly Savings by Education*

## Strategy by Education Level

Education level also affects the shock coping behavior: only 26% of respondents whose max grade passed is between 0 and 8 adopted an optimal strategy, while the percentage grows to 31% for respondents who passed at least grade 9, 34% for matriculated and 37% for respondents with tertiary education. The relationship between strategy and education status is not statistically significant

**Shock Coping Behavior Strategy by Education**

| | Education Level | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Strategy | 0-8 | | 9-11 | | 12 | | Tertiary | | Total | |
| | % | N | % | N | % | N | % | N | % | N |
| Sub-optimal | 60% | 58 | 59% | 109 | 56% | 57 | 49% | 20 | 58% | 244 |
| Neutral | 14% | 13 | 10% | 19 | 10% | 10 | 15% | 6 | 11% | 48 |
| Optimal | 26% | 25 | 31% | 57 | 34% | 34 | 37% | 15 | 31% | 131 |
| Total | 100% | 96 | 100% | 185 | 100% | 101 | 100% | 41 | 100% | 423 |

Pearson chi2(6) = 3.3454 Pr = 0.764

*Table 19: Shock Coping Behavior by Education*

## Employment Status

The table below shows that employed (either formally or informally) respondents have a more positive perception of the financial situation of the household, as 32% of formally employed and 18% of informally ones think they are confortable or providing for extras, opposed to 11% of unemployed ones. Only 68% of the formally employed think their

financial situation is not good, opposed to 81% of informally employed and 88% of the unemployed. The relationship between the variables is statistically significant.

**Perceived Financial Situation vs Employment Status**

| How would you describe the financial situation of your household? | Employment Status | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Formal | | Informal | | Unemployed | | Total | |
| | % | N | % | N | % | N | % | N |
| Insufficient | 29% | 32 | 51% | 53 | 63% | 198 | 54% | 283 |
| Basic | 39% | 43 | 30% | 31 | 25% | 79 | 29% | 153 |
| Extra | 23% | 25 | 16% | 16 | 7% | 22 | 12% | 63 |
| Comfortable | 9% | 10 | 2% | 2 | 4% | 13 | 5% | 25 |
| Dont Know | 0% | 0 | 1% | 1 | 1% | 2 | 1% | 3 |
| Total | 100% | 110 | 100% | 103 | 100% | 314 | 100% | 527 |

Pearson chi2(8) = 48.6026 Pr = 0.000

*Table 20: Perceived Financial Situation by Employment Status*

The table below shows that employed (either formally or informally) respondents have a more positive perception of the financial security of the household, as 48% of formally employed and 26% of informally ones agree or strongly agree, opposed to 30% of unemployed ones. Only 37% of the formally employed think their financial situation is not safe, opposed to 52% of informally employed and 55% of the unemployed. The relationship between the variables is statistically significant.

**Financial Security vs Emplyment Status**

| | Employment Status | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Formal | | Informal | | Unemployed | | Total | |
| **Financial Security of the Household** | % | N | % | N | % | N | % | N |
| Strongly Disagree | 10% | 11 | 37% | 38 | 38% | 121 | 32% | 170 |
| Disagree | 27% | 30 | 15% | 15 | 17% | 54 | 19% | 99 |
| Neutral | 15% | 16 | 21% | 22 | 15% | 46 | 16% | 84 |
| Agree | 42% | 46 | 22% | 23 | 27% | 84 | 29% | 153 |
| Strongly Agree | 6% | 7 | 4% | 4 | 3% | 9 | 4% | 20 |
| Dont Know | 0% | 0 | 1% | 1 | 0% | 1 | 0% | 2 |
| Total | 100% | 110 | 100% | 103 | 100% | 315 | 100% | 528 |

Pearson chi2(10) = 41.8272 Pr = 0.000

*Table 21: Perceived Financial Security by Employment*

As expected employment status affects the monthly savings: formally employed tend to save more in the higher brackets, especially in the higher than R1000 category (9% vs 2%) and R201 to R500 category (35% vs 25%). Informally employed respondents save more in the R101 to R200 bracket (23% vs 11%). The relationship between the variables is statistically significant. Unemployed ones are those who save more in the lowest bracket of less than R100.

| Amount saved every month by Employment | Employment Status | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Formal | | Informal | | Unemployed | | Total | |
| | % | N | % | N | % | N | % | N |
| Less Than R100 | 4% | 3 | 14% | 8 | 15% | 19 | 11% | 30 |
| R101 To R200 | 11% | 9 | 23% | 13 | 32% | 39 | 23% | 61 |
| R201 To R500 | 35% | 29 | 25% | 14 | 23% | 28 | 27% | 71 |
| R501 To R1000 | 21% | 17 | 25% | 14 | 10% | 12 | 16% | 43 |
| More Than R1000 | 9% | 7 | 2% | 1 | 2% | 2 | 4% | 10 |
| Refuse | 21% | 17 | 12% | 7 | 19% | 23 | 18% | 47 |
| Total | 100% | 82 | 100% | 57 | 100% | 123 | 100% | 262 |
| Pearson chi2(10) = 33.4824 Pr = 0.000 | | | | | | | | |

*Table 22: Monthly Savings by Employment*

## Strategy vs. Employment Status

Employment status affects shock-coping behavior: 46% of respondents who are employed informally adopted an optimal strategy versus 39% of the ones who are formally employed against only 31% of the unemployed ones. 58% of unemployed respondents adopted a sub-optimal strategy. The relationship between strategy and employment status is statistically significant

| Shock Coping Behavior Strategy by Employment | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Employment Status | | | | | | | |
| Strategy | Formal | | Informal | | Unemployed | | Total | |
| | % | N | % | N | % | N | % | N |
| Sub-optimal | 52% | 46 | 46% | 36 | 64% | 162 | 58% | 244 |
| Neutral | 9% | 8 | 9% | 7 | 13% | 33 | 11% | 48 |
| Optimal | 39% | 35 | 46% | 36 | 24% | 60 | 31% | 131 |
| Total | 100% | 89 | 100% | 79 | 100% | 255 | 100% | 423 |
| Pearson chi2(4) = 17.5155 Pr = 0.002 | | | | | | | | |

*Table 23: Shock Coping Behavior by Employment*

## Monthly Savings and Savings Methods

Savings affect shock-coping behavior: 38% of respondents who save less than R500 per month adopted an optimal strategy, compared to 50% for respondents who save more than R500 per month. The relationship between strategy and monthly savings is not statistically significant.

| Shock Coping Behavior Strategy by Amount Saved | | | | | | |
|---|---|---|---|---|---|---|
| | Savers | | | | | |
| Strategy | Small Savers <500/month | | Big Savers >500/month | | Total | |
| | % | N | % | N | % | N |
| Sub-optimal | 51% | 64 | 39% | 15 | 48% | 79 |
| Neutral | 10% | 13 | 11% | 4 | 10% | 17 |
| Optimal | 38% | 48 | 50% | 19 | 41% | 67 |
| Total | 100% | 125 | 100% | 38 | 100% | 163 |
| Pearson chi2(2) = 1.7812 Pr = 0.410 | | | | | | |

*Table 24: Shock Coping Behavior by Monthly Savings*

The tables below compare shock coping behavior with the savings method adopted by the respondents and show that those who save using stokvels, funeral plan, or cash in a safe place adopted better strategies that those who used bank accounts. Although this sounds counter-intuitive, a possible explanation is that money saved through forms of insurances like funeral plan or stokvels is not immediately available for withdrawal and therefore is more suitable when facing determined shocks, like a funeral plan in case of the death of an household member. The relationships between strategy and savings method are statistically significant (except for Mobile Money).

**STRATEGY Vs SAVINGS METHODS**

| | **Stokvel** | | | | | |
|---|---|---|---|---|---|---|
| **Strategy** | No | | Yes | | Total | |
| | % | N | % | N | % | N |
| Sub-optimal | 58% | 77 | 40% | 27 | 52% | 104 |
| Neutral | 10% | 13 | 10% | 7 | 10% | 20 |
| Optimal | 32% | 43 | 50% | 34 | 38% | 77 |
| Total | 100% | 133 | 100% | 68 | 100% | 201 |

Pearson chi2(2) = 6.5561 Pr = 0.038

| | **Cash in a Safe Place** | | | | | |
|---|---|---|---|---|---|---|
| | No | | Yes | | Total | |
| | % | N | % | N | % | N |
| Sub-optimal | 57% | 92 | 30% | 12 | 52% | 104 |
| Neutral | 10% | 16 | 10% | 4 | 10% | 20 |
| Optimal | 33% | 53 | 60% | 24 | 38% | 77 |
| Total | 100% | 161 | 100% | 40 | 100% | 201 |

Pearson chi2(2) = 10.6958 Pr = 0.005

| | **Insurance** | | | | | |
|---|---|---|---|---|---|---|
| Strategy | 0 | 0 | 1 | 1 | Total | Total |
| | % | N | % | N | % | N |
| Sub-optimal | 53% | 100 | 29% | 4 | 52% | 104 |
| Neutral | 9% | 16 | 29% | 4 | 10% | 20 |
| Optimal | 38% | 71 | 43% | 6 | 38% | 77 |
| Total | 100% | 187 | 100% | 14 | 100% | 201 |

Pearson chi2(2) = 6.8866 Pr = 0.032

| | **Ewallet** | | | | | |
|---|---|---|---|---|---|---|
| | No | | Yes | | Total | |
| | % | N | % | N | % | N |
| Sub-optimal | 52% | 103 | 100% | 1 | 52% | 104 |
| Neutral | 10% | 20 | 0% | 0 | 10% | 20 |
| Optimal | 38% | 77 | 0% | 0 | 38% | 77 |
| Total | 100% | 200 | 100% | 1 | 100% | 201 |

Pearson chi2(2) = 0.9374 Pr = 0.626

| | **Bank Account** | | | | | |
|---|---|---|---|---|---|---|
| **Strategy** | No | | Yes | | Total | |
| | % | N | % | N | % | N |
| Sub-optimal | 49% | 21 | 53% | 83 | 52% | 104 |
| Neutral | 21% | 9 | 7% | 11 | 10% | 20 |
| Optimal | 30% | 13 | 41% | 64 | 38% | 77 |
| Total | 100% | 43 | 100% | 158 | 100% | 201 |

Pearson chi2(2) = 7.6484 Pr = 0.022

| | **Funeral Plan** | | | | | |
|---|---|---|---|---|---|---|
| | No | | Yes | | Total | |
| | % | N | % | N | % | N |
| Sub-optimal | 58% | 82 | 37% | 22 | 52% | 104 |
| Neutral | 9% | 13 | 12% | 7 | 10% | 20 |
| Optimal | 33% | 46 | 52% | 31 | 38% | 77 |
| Total | 100% | 141 | 100% | 60 | 100% | 201 |

Pearson chi2(2) = 7.9938 Pr = 0.018

*Table 25: Shock Coping Behavior by Savings Methods*

## Perceived Improvement in Dealing with Unexpected Events

Finally, respondents were asked if they perceive their ability to deal with unexpected events has improved since they set aside more money using either a mobile money account (for mobile money users) or other savings methods (for non-users). All 21 respondents who are mobile money users indicated they perceived an improvement, while among the ones who use mainly other savings methods 97% of respondents (255 out of 262) answered yes.

| Saving Method | Users | Save | Don't Save | Ability Improved | Ability Not Improved |
|---|---|---|---|---|---|
| Bank Account | | 207 | 321 | 202 | 5 |
| Insurance | | 21 | 507 | 21 | 0 |
| Stokvel | | 87 | 441 | 86 | 1 |
| Funeral Plan | | 80 | 448 | 77 | 3 |
| Mobile Money | 78 | 21 | 507 | 21 | 0 |

*Table 26: Perceived Improvement in dealing with Unexpected Events*

## Types of Shock

The tables below show how shock-coping behavior is affected by the type of shock suffered by the household. We have obtained statistically significant relationship between strategy and the following type of shock: accident, business failure and death of a household member. The data shows that worst strategies occurred as a consequence of break-in (67% sub-optimal, n=32), theft (64% sub-optimal, n=27), steep food price increase (61%, n=144). The more optimal strategies have been applied as a consequence of the following shocks: business failure (50%, n=14), death of a household member (54%, n=31), damaged dwelling (43%, n=20), death of household head (42%, n=20).

**STRATEGY VS TYPES OF SHOCK**

| | | | Steep Food Price Increase | | | |
|---|---|---|---|---|---|---|
| Strategy | No % | No N | Yes % | Yes N | Total % | Total N |
| Sub-optimal | 53% | 100 | 61% | 144 | 58% | 244 |
| Neutral | 14% | 26 | 9% | 22 | 11% | 48 |
| Optimal | 33% | 61 | 30% | 70 | 31% | 131 |
| Total | 100% | 187 | 100% | 236 | 100% | 423 |
| Pearson chi2(2) = 3.2536 Pr = 0.197 | | | | | | |
| | | | Accident | | | |
| Strategy | No % | No N | Yes % | Yes N | Total % | Total N |
| Sub-optimal | 62% | 182 | 48% | 62 | 58% | 244 |
| Neutral | 10% | 30 | 14% | 18 | 11% | 48 |
| Optimal | 28% | 82 | 38% | 49 | 31% | 131 |
| Total | 100% | 294 | 100% | 129 | 100% | 423 |
| Pearson chi2(2) = 7.0386 Pr = 0.030 | | | | | | |
| | | | Break-in | | | |
| Strategy | No % | No N | Yes % | Yes N | Total % | Total N |
| Sub-optimal | 57% | 212 | 67% | 32 | 58% | 244 |
| Neutral | 11% | 42 | 12% | 6 | 11% | 48 |
| Optimal | 32% | 121 | 21% | 10 | 31% | 131 |
| Total | 100% | 375 | 100% | 48 | 100% | 423 |
| Pearson chi2(2) = 2.6171 Pr = 0.270 | | | | | | |
| | | | Business Fail | | | |
| Strategy | No % | No N | Yes % | Yes N | Total % | Total N |
| Sub-optimal | 59% | 233 | 39% | 11 | 58% | 244 |
| Neutral | 11% | 45 | 11% | 3 | 11% | 48 |
| Optimal | 30% | 117 | 50% | 14 | 31% | 131 |
| Total | 100% | 395 | 100% | 28 | 100% | 423 |
| Pearson chi2(2) = 5.2766 Pr = 0.071 | | | | | | |
| | | | Damaged dwelling | | | |
| Strategy | No % | No N | Yes % | Yes N | Total % | Total N |
| Sub-optimal | 59% | 224 | 43% | 20 | 58% | 244 |
| Neutral | 11% | 42 | 13% | 6 | 11% | 48 |
| Optimal | 29% | 111 | 43% | 20 | 31% | 131 |
| Total | 100% | 377 | 100% | 46 | 100% | 423 |
| Pearson chi2(2) = 4.5441 Pr = 0.103 | | | | | | |
| | | | Death of Household Member | | | |
| Strategy | No | No | Yes | Yes | Total | Total |

| | | | | | | |
|---|---|---|---|---|---|---|
| | % | N | % | N | % | N |
| Sub-optimal | 61% | 225 | 33% | 19 | 58% | 244 |
| Neutral | 11% | 41 | 12% | 7 | 11% | 48 |
| Optimal | 27% | 100 | 54% | 31 | 31% | 131 |
| Total | 100% | 366 | 100% | 57 | 100% | 423 |
| Pearson chi2(2) = 18.4861 Pr = 0.000 | | | | | | |
| | | | Death of Household Head | | | |
| Strategy | No | No | Yes | Yes | Total | Total |
| | % | N | % | N | % | N |
| Sub-optimal | 59% | 223 | 44% | 21 | 58% | 244 |
| Neutral | 11% | 41 | 15% | 7 | 11% | 48 |
| Optimal | 30% | 111 | 42% | 20 | 31% | 131 |
| Total | 100% | 375 | 100% | 48 | 100% | 423 |
| Pearson chi2(2) = 4.3225 Pr = 0.115 | | | | | | |
| | | | Communal Fights | | | |
| Strategy | No | No | Yes | Yes | Total | Total |
| | % | N | % | N | % | N |
| Sub-optimal | 58% | 240 | 50% | 4 | 58% | 244 |
| Neutral | 11% | 46 | 25% | 2 | 11% | 48 |
| Optimal | 31% | 129 | 25% | 2 | 31% | 131 |
| Total | 100% | 415 | 100% | 8 | 100% | 423 |
| Pearson chi2(2) = 1.5167 Pr = 0.468 | | | | | | |
| | | | End of Regular Financial Support | | | |
| Strategy | No | No | Yes | Yes | Total | Total |
| | % | N | % | N | % | N |
| Sub-optimal | 58% | 226 | 51% | 18 | 58% | 244 |
| Neutral | 11% | 42 | 17% | 6 | 11% | 48 |
| Optimal | 31% | 120 | 31% | 11 | 31% | 131 |
| Total | 100% | 388 | 100% | 35 | 100% | 423 |
| Pearson chi2(2) = 1.3907 Pr = 0.499 | | | | | | |
| | | | Theft | | | |
| Strategy | No | No | Yes | Yes | Total | Total |
| | % | N | % | N | % | N |
| Sub-optimal | 57% | 217 | 64% | 27 | 58% | 244 |
| Neutral | 11% | 42 | 14% | 6 | 11% | 48 |
| Optimal | 32% | 122 | 21% | 9 | 31% | 131 |
| Total | 100% | 381 | 100% | 42 | 100% | 423 |
| Pearson chi2(2) = 2.0777 Pr = 0.354 | | | | | | |
| | | | Loss of Employment | | | |
| Strategy | No | No | Yes | Yes | Total | Total |
| | % | N | % | N | % | N |
| Sub-optimal | 61% | 156 | 52% | 88 | 58% | 244 |
| Neutral | 10% | 25 | 14% | 23 | 11% | 48 |
| Optimal | 29% | 74 | 34% | 57 | 31% | 131 |
| Total | 100% | 255 | 100% | 168 | 100% | 423 |
| Pearson chi2(2) = 3.4945 Pr = 0.174 | | | | | | |

*Table 27: Shock Coping Behavior by Types of Shock*

# 6. Conclusions

In this paper we report the results of the interviews of 528 households in Khayelitsha, Cape Town in order to understand their savings behavior and their ability to manage unexpected events or shocks after their occurrence. We investigated usage of different savings instruments from bank accounts, to community based savings schemes like stokvels and funeral plans up to technology-based instruments like mobile-money solutions. We organized our study around some core "themes" in order to determine how savings behavior is affected by respondents' approach to life, educational level, and employment status. We point out that the choice of conducting the survey only in Khayelitsha is a limitation of the research, as we would have preferred to have a more representative sample of the South African Metropolitan Townships, for example by

extending the survey in Johannesburg and Durban and including townships not inhabited only by black population. Unfortunately budget limitations have prevented us from doing so.

Households are most brick and mortar, with water and electricity connected, with more than 50% having more than 2 children per household.

Cellphone usage is mainly for calls and messaging, with only 15% declaring using the phone for mobile money. FNB eWallet is by far the most popular mobile money offering utilized (44%). However, frequency of usage is very low, as almost half of the respondents admit they use it only once a month. This is in line with expectations as employed respondents choose to put some money aside when they receive their salaries. Those ones who use the phone for mobile money however keep healthy balances in it at the end of the month, with 45% indicating a balance of R500 or more. Also a large percentage indicates the product allows them to save more and more often. Safety risk is reported as the main reason for mobile money non-usage.

Bank accounts are the main tool used to save, confirming data from other researches like (ikapadata, 2012), showing that 80% of the population in the area is banked. However, other popular savings methods include stokvels (33%), funeral plans (30%) and cash in a safe place (21%).

The perceived financial situation of the household is very poor: 54% describes it as insufficient, 29% say they can meet only basic needs. Only 17% thinks it is either "providing for some extras" or it is "comfortable". 51% does not feel financially safe, and only 33% thinks they are somehow safe.

Relationship between approach to life and financial situation: there is a significant difference between the perceived situation of respondents with "save" attitude compared to those ones who tend more to "spend", as 89% of respondents who declare themselves more incline to "spend" think their household financial situation is either "insufficient" of allows to "meet only basic needs", versus 80% of the respondents who declare themselves more incline to "save". Similarly 17% of the "spenders" ones think the

household financial situation allows to “provide for some extra needs” or is “comfortable” versus 20% of the “savers” think so. This explains that as savers tend to put aside spare money as opposed to spend it, they tend to have a better perception of their financial situation and think they can cater for some “extra needs” as opposed to “basic needs”. The relationship is likely to be bi-directional: a saving attitude results in a better financial situation but a better financial situation also 'affords' one to have a saving attitude.

Similarly the perceived financial situation of the household is “insufficient” for 63% those who declare they “live on a day to day basis” and 60% of the “family oriented” ones, while it is better among those who “plan for the future” (only 38%) or think “security is a priority” (only 42% think its insufficient).

As expected, employment status affects the financial situation, as employed (either formally or informally) respondents have a more positive perception of the financial situation of the household; 32% of formally employed and 18% of informally ones think they are confortable or providing for extras, opposed to 11% of unemployed. Education level also affects the financial situation: 94% of respondent who completed up to grade 8 indicated that their financial situation is either “insufficient” or “allows to meet only basic needs”, down to 74% for those who completed grade 12 and 71% for those who have tertiary education. This can be explained as higher education increases the chances of finding employment that acts as intermediate variable that in turn affects the financial situation.

The data shows that poor people do save: only 11% declares to be saving less than R100/month, 23% save between R101-200, 27% between R201-R500. Females tend to save more in the lower brackets, while males save more in the R500+, with the difference between male and female statistically significant. Similarly, while the employed save more in the bigger amounts, only 15% of unemployed declares to save less than R100 per month, with 32% declaring to save between R101 and R200 per month.

Unexpected events affect spending behavior, with opening a bank account and having children are predominant. We however distinguished between events that have been initiated by the respondent or on which the respondent has full control like opening a bank account, joining a *stokvel*, getting insurance as opposed to external events that are

non-controllable or less-controllable like rising food prices, having children, having a loss in the family. Correlation tests showed that intentional events are much more significant in affecting savings behavior than unintentional events.

We recoded the shock coping behavior into three strategies that we called “Optimal”, “Sub-optimal” and “Neutral”, and found that 57% of households adopted a “sub-optimal” strategy while 31% adopted an “optimal” strategy. To answer our initial research questions, correlation tests showed statistically significant relationships between better strategies and employment status or education level, where respondents who are employed or have passed higher grades at school adopt better strategies. Also we found that respondents who use other saving methods besides a bank account adopt better strategies: in particular we have 50% of respondents who use stokvels adopted an optimal strategy, insurance/funeral plan (50%), cash in a safe place (60%), compared to bank account (41%). Although this may sounds counter-intuitive, money saved through forms of insurances like funeral plan or stokvels is not available for withdrawal anytime and therefore is more suitable when facing determined shocks, like a funeral plan in case of the death of an household member.

We also find statistical significant relationships between strategy and approach to life: 57% of respondents who declare themselves more incline to “save” employed a sub-optimal strategy, while 32% employed an optimal strategy. Instead 59% of respondents with a “spend” propensity employed a sub-optimal strategy while 28% employed an optimal strategy. Also 40% of respondents who declared “security is everything” adopted an optimal strategy. Optimal strategy adoption is lowest among respondents who declared to live “day by day”.

We did not find enough statistical evidence that savings through mobile-money instruments improves shock-coping behavior although all the respondents who use some mobile-money product indicated that they perceive an improvement in their ability to deal with unexpected events. Similarly 97% of respondents who save using stokvels or other methods perceived an improvement.

We found also different strategy outcomes depending on the type of shock suffered. In particular worse strategies occur as a consequence of household breakup (100% sub-optimal), livestock dead or stolen (100% sub-optimal), break-in (67%), theft (64% sub-optimal), steep food price increase (61%). The more optimal strategies have been applied as a consequence of the following shocks: business failure (50%), death of a household member (54%), damaged dwelling (43%), death of household head (42%).

<Academic or Practical implications of the research>

Finally, I want to suggest some recommendations for future researches. As pointed by (Tubbs, 2013), although some market players estimated there were over 13 million "economically active" people without a bank account in South Africa, mobile money services have struggled to gain traction and actually have only a few hundred thousand users in SA. The reasons behind this failure are high transaction costs, legislation limitations and the integration needed to move the money from a bank account to a mobile wallet. A major limitation in our research that prevented us from obtaining significant results was the low take-up of mobile money services in the sample, in contrast with a high banking subscribing rates. So in order to target areas where take-up of mobile money service is higher, collaboration with a mobile money provider that can supply relevant data is advisable. Besides helping in choosing a better sample, the mobile operator can also supply more reliable data on mobile savings that the ones collected with the interviews.

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# Appendix A: Questionnaire and Variables List

| Variable Name | Type | Label | Question |
|---|---|---|---|
| hh_size | integer | | How many people live in this household? |
| gender | byte | Gender | |
| age | ordinal | | How old are you? |
| approach | Categorical | I live only for now<br>I live to survive day to day<br>I live for myself<br>I live for my family<br>I plan for the future<br>Stability and security is everything to me<br>Don't know | What best describes your approach to life? |
| spendvssave | Categorical | I try to save my money for times when I really need it.<br>I spend my money quickly because I do not know what the future holds. | Which of these two statements applies best to you? |
| spare1 | Categorical | Treat Yourself (alcohol/cigarettes/junk food)<br>Gambling<br>Lotto<br>Buy airtime<br>Buy a gift for your partner<br>Buy groceries for the house<br>Invest in your business<br>Put money into account<br>Buy clothes | When you have spare money, what is usually the FIRST thing you do with it? |
| spare2 | Categorical | | When you have spare money, what is usually the SECOND thing you do with it? |
| spare3 | Categorical | | When you have spare money, what is usually the THIRD thing you do with it? |
| cut1 | Categorical | Food<br>School fees<br>Gambling<br>Lotto<br>Alcohol<br>Cigarettes<br>Junk Food<br>Airtime<br>Clothes | If you would have to cut your expenses, which of these is the FIRST expense you would cut? |
| cut2 | Categorical | | If you would have to cut your expenses, which of these is the SECOND expense you would cut? |
| cut3 | Categorical | | If you would have to cut your expenses, which of these is the THIRD expense you would cut? |
| event | Categorical | Opened a bank account<br>Got insurance | Have any of these events influenced your attitude to savings/money in your |

| | | | |
|---|---|---|---|
| | | Became member of a stokvel<br>Started using mobile money (e.g. Mpesa, eWallet etc.)<br>Won the Lotto<br>Got a job<br>Bought a house<br>The recession<br>Rising food prices<br>Rising petrol prices<br>Getting married/divorced/engaged<br>Having children<br>A loss in the family<br>Receiving a large inheritance/gift | life? |
| eventother | text | | What other event has influenced your attitude to savings/money in your life? |
| security | Likert | | Do you agree that on the whole you feel secure with the financial situation of your household? |
| situation | Ordinal | We don't even have enough to meet basic expenses<br>We just meet basic expenses<br>We meet basic expenses with a little bit of money left for extras<br>We live comfortably<br>Don't know | How would you describe the financial situation of your household? |
| saving | byte | Y/N | Do you regularly put money aside for savings? |
| reason | Categorical | To pay for a health emergency<br>To buy food when income is low<br>To pay for school fees or school material<br>To repay a debt<br>To pay for home maintenance<br>To invest in my current business<br>To start a new business<br>To pay for a funeral<br>To buy gold<br>To buy a house<br>To extend my house<br>To rent a bigger house<br>To pay medical bills<br>To pay lobola<br>To pay for a wedding | Why do you regularly put money aside for savings? |

| | | | |
|---|---|---|---|
| | | To pay for my own education/skills training<br>To pay for future education of my children<br>Other<br>None | |
| reasonother | text | | For what other reason do you regularly put money aside for savings? |
| method | Categorical | Bank Account<br>Funeral Plan<br>Life Insurance Policy<br>Cash Back Plan<br>Household Insurance<br>Car Insurance<br>FNB eWallet<br>Mpesa<br>MTN Mobile Money<br>WIZZIT<br>Stokvel<br>Cash in a safe place<br>With neighbours, relatives or friends<br>Other (specify)<br>None | Which of the following methods do you use for putting money aside? |
| methodother | text | | What other method do you regularly use to put money aside for savings? |
| amount | Ordinal | Less than R100<br>R101 to R200<br>R201 to R500<br>R501 to R1000<br>More than R1000<br>Refuse | How much money do you put aside every month? (in Rand) |
| cell | byte | Y/N | Do you own a cellphone? |
| service | Categorical | Wizzit<br>FNB eWallet<br>M-PESA<br>MTN Mobile Money<br>Other<br>I do not use any mobile money product | Which of the following mobile money services do you use? |
| serviceother | text | Which other mobile money service do you use? | |
| freq_use | Categorical | Never<br>Less than Monthly<br>Monthly<br>Biweekly | How often do you use your Mobile Money account? |
| freq_save | Categorical | | How often do you put money into your for savings? |

| | | | |
|---|---|---|---|
| | | Weekly<br>Few days per week | |
| month | Categorical | Less than R100<br>R101 to R200<br>R201 to R500<br>R501 to R1000<br>More than R1000 | How much money do you usually have in your Mobile Money account at month's end? |
| started | Categorical | Less than 3 months<br>Less than 6 months<br>Less than 1 year<br>1 to 2 years<br>More than 2 years | When did you start using Mobile Money account? |
| more | Y/N | | Do you think you are saving (putting aside) more money every month since you started using your mobile money account? |
| saved | Categorical | Less than R100<br>R101 to R200<br>R201 to R500<br>R501 to R1000<br>More than R1000 | How much more per month? |
| often | Y/N | | Do you think you put money aside more often since you started using Mobile Money account? |
| best | Categorical | | Which feature of the mobile money services you use do you appreciate the most? |
| bestother | text | | Which other feature of the mobile services you use do you appreciate the most? |
| heard | Categorical | Wizzit<br>FNB eWallet<br>M-PESA<br>MTN Mobile Money<br>None | Have you ever heard of any of the following? |
| future | Categorical | Y/N/Don't know | Are you planning to use any of those products in the near future? |
| feature | Categorical | Safety<br>Ease of Use<br>Cost of service<br>Confidentiality<br>Usefulness in Emergencies<br>Good for saving money | What features of these services are most attractive to you? |

| | | | |
|---|---|---|---|
| | | None | |
| featureother | text | | What other feature is attractive to you? |
| no_use | Categorical | Unsafe<br>Difficult to use<br>Expensive<br>Lacks confidentiality<br>Risky<br>Other | Why would you not use any of these services? |
| no_useother | text | | For what other reason would you not use any of these services? |
| shock | Categorical | Death of the household head (breadwinner)<br>Death of a household member<br>Loss of Employment<br>Communal fights<br>Household break-up<br>Dwelling damaged<br>End of regular financial support<br>Theft<br>Break-in<br>Business failure<br>Serious Illness/accident<br>Steep Rise in food prices<br>Livestock dead/stolen | Did your household experience any of the following unexpected events in the last 12 months? |
| shockother | text | | What other unexpected event did your household experience in the last 12 months? |
| result | Categorical | Worked more<br>Moved somewhere else for work<br>Reduced consumption of goods/services<br>Bought less food<br>Sold Assets (e.g. car, appliances, furniture)<br>Used cash savings<br>Received money from friends/relatives<br>Received money from government (e.g. grant)<br>Got a loan<br>Stopped paying school feels<br>Sold my business<br>Left my family<br>Took up (more) insurance<br>Started putting more money aside every month | Did you do any of the following as a result of an unexpected event? |

| | | | |
|---|---|---|---|
| | | Joined a stokvel<br>Took out a funeral plan<br>Opened a bank account<br>Started using a mobile money service (e.g. eWallet, Wizzit, MTN Mobile Money, Mpesa)<br>Started having a financial advisor<br>Stopped spending money on my house<br>Other (specify)<br>Did not do anything | |
| resultother | text | | What else did you do as a result of an unexpected event? |
| usage | Categorical | Make or Receive a call<br>Send or receive a SMS<br>Buy airtime<br>Use Facebook<br>Use Twitter<br>Use Mxit<br>Use Whatsapp<br>Use BBM<br>Send or receive emails<br>Send or receive money<br>Pay a bill<br>Use the internet<br>None | Do you use your cellphone for any of the following on a regular basis? |
| improve_mm | Y/N | | Do you think that putting money aside each month using your mobile money service(s) has improved your ability to deal with unexpected financial shocks? |
| improve_trad | Y/N | | Do you think that regularly putting money aside each month has improved your ability to deal with unexpected financial shocks? |
| spending | Categorical | Pay school fees<br>Pay bills/expenses<br>Buy a TV or some other house appliance<br>Buy something for the house structure improvement (toilets, roofs, etc)<br>Buy some machinery/equipment for your business<br>Pay for a funeral<br>Pay lobola<br>Other (specify)<br>None | In the last 12 months, have you used money from your savings account, insurance, funeral plan or stockvel for any of the following? |

| | | | |
|---|---|---|---|
| spendingother | text | | In the last 12 months, what else have you used money from your savings account, insurance, funeral plan or stockvel for? |
| language | Categorical | Xhosa<br>Zulu<br>Sepedi<br>Sotho<br>Tsonga<br>English<br>Other (specify) | What is your first language? |
| languageother | text | | What other language is your first language? |
| age | Ordinal | 18-29<br>30-39<br>40+ | How old are you? |
| educ_year | Ordinal | 0<br>1<br>2<br>3<br>4<br>5<br>6<br>7<br>8<br>9<br>10<br>11<br>12 | What is the highest grade in school that you have successfully completed? |
| educ_higher | Categorical | FET<br>University<br>University of Technology<br>Other<br>None | What is the highest level of post-secondary education you have successfully comp |
| employment | Categorical | full-time formal employment<br>part-time formal employment<br>full-time informal employment<br>part-time informal employment<br>self-employed (formal)<br>self-employed (informal)<br>Student<br>Pensioner/Retired<br>Unemployed | What is your current employment status? |
| marital | Categorical | Married<br>Partner, not married<br>Single, separated | What is your marital status? |

| | | | |
|---|---|---|---|
| | | Single, widowed<br>Single, never married | |
| children | integer | | How many children do you have? |
| water | Categorical | Communal tap<br>Tap in yard (outside)<br>Tap in house (inside) | Where do you get the water for your household? |
| electricity | Y/N | | Do you have electricity at your home? |
| voucher | Y/N | Do you want R10 airtime as compensation for your time? (The airtime can only be sent to a cellphone with a prepaid MTN/Vodacom/Cell C or 8ta SIM-card. The respondent can choose to send the airtime to someone else's phone.) | |
| contact | text | Respondent phone number | |
| phone_calc | calculate | | |
| note_number | note | Phone number must start with 060, 061, 071, 072, 073, 074, 076, 078, 079, 081, 082, 083 or 084 | |
| network | Categorical | Choose the network | |
| note_end | note | End of interview. Please thank the respondent. | |
| roof | Categorical | Asbestos<br>Iron<br>Tiles<br>Wood<br>Other (specify) | What type of roof does the respondent's housing have? |
| roofother | text | | What type of roof does the respondent's housing have? (Other) |
| walls | Categorical | Brick<br>Iron<br>Wood | What type of walls does the respondent's housing have? |
| wallsother | text | | What type of walls does the respondent's housing have? (Other) |
| gender | M/F | Gender of the respondent | |
| fw_comment | text | | Comments from the interviewer |
| gps | geopoint | | Location of the interview. |

# Appendix B. Table of Correlation Tests

| Dependent Variable | | Independent Variable | | Test |
|---|---|---|---|---|
| | Type | | Type | |
| Strategy (Shock Coping Behavior) | categorical | Approach | categorical | Chi2 |
| | | Spendvssave | categorical | Chi2 |
| | | Employment | categorical | Chi2 |
| | | Education | Ordinal | Chi2 |
| Perceived Household Financial Security | ordinal | Approach | categorical | Chi2 |
| | | Spendvssave | categorical | Chi2 ranksum |
| | | Employment | categorical | Chi2 |
| | | Education | ordinal | Chi2 gamma taub |
| Perceived Household Financial Situation | ordinal | Approach | categorical | Chi2 |
| | | Spendvssave | categorical | Chi2 ranksum |
| | | Employment | categorical | Chi2 |
| | | Education | ordinal | Chi2 gamma taub |
| | | | | |
| Strategy | categorical | Savings Methods | | Chi2 |
| Strategy | categorical | Amount | orodinal | Chi2 |
| Strategy | categorical | Situation | ordinal | Chi2 |
| Strategy | categorical | Month | ordinal | Chi2 |
| Amount | ordinal | Gender | categorical | Chi2, ranksum |
| | ordinal | Education | ordinal | Chi2 gamma taub |
| | ordinal | Employment | categorical | Chi2 |
| Month (MM savings) | ordinal | Gender | categorical | Chi2, ranksum |
| | ordinal | Education | ordinal | Chi2 gamma taub |
| | ordinal | Employment | categorical | Chi2 |
| Strategy | ordinal | Education | ordinal | Chi2 gamma taub |
| Result | ordinal | Employment | categorical | Chi2 |
| | | | | |