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Exploring the effects of financial incentives on health savings

Doriane Nzorubara



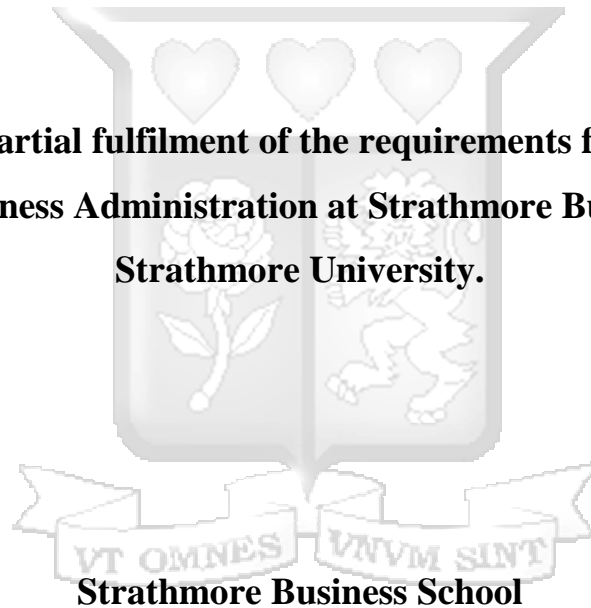
Master of Business Administration

2017

Exploring the effects of financial incentives on health savings

Doriane Nzorubara

**Submitted in partial fulfilment of the requirements for the Degree of
Master of Business Administration at Strathmore Business School -
Strathmore University.**



Strathmore Business School

Strathmore University

Nairobi, Kenya.

May, 2017

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DORIANE NZORUBARA

STUDENT NO: 87887

STRATHMORE BUSINESS SCHOOL

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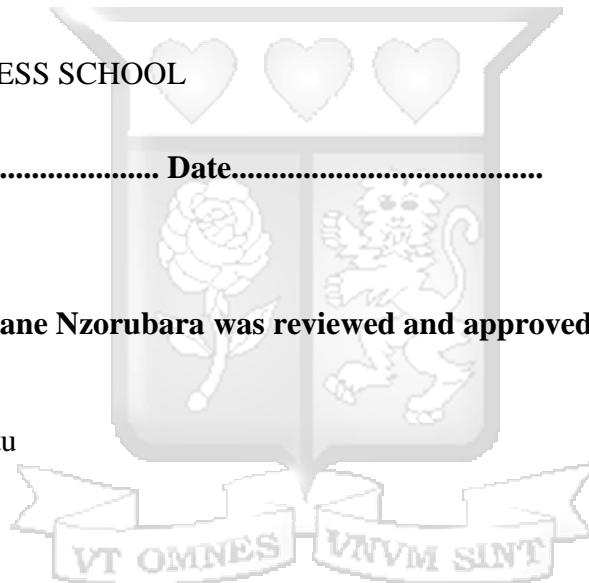
Approval

The dissertation of Doriane Nzorubara was reviewed and approved by:

Dr. Simon Wagura Ndiritu
Lecturer
Strathmore University

Dr. George Njenga
Dean, Strathmore Business School
Strathmore University

Prof. Ruth Kiraka
Dean, School of Graduate Studies Strathmore University
Strathmore University



ABSTRACT

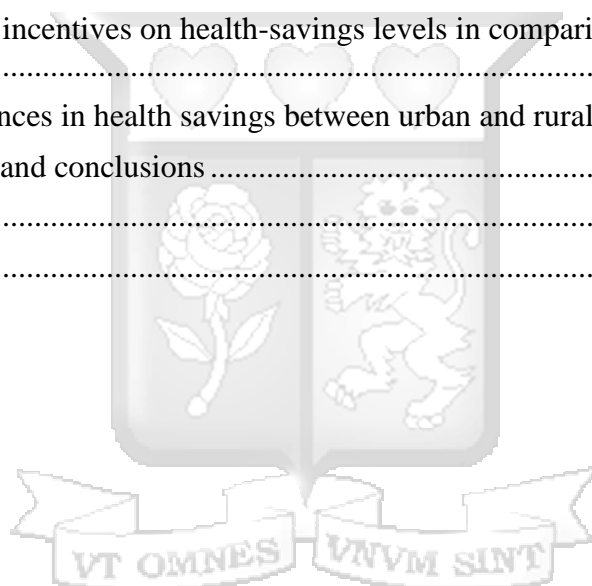
Despite tremendous reforms from the Government of Kenya and NHIF to improve access to insurance coverage among its most vulnerable population, the health insurance uptake among the poorest quintile remains low. Many studies show that there is a high need for more diverse financial service options (such as savings products) that will help people manage short-term liquidity and long-term investment in the face of tremendous uncertainty in their incomes and consumption needs – unforeseen healthcare expenses being a major example of a significant unexpected household consumption need. This study evaluates the effects of introducing financial (monetary) incentives on health savings’ levels in a context among savings’ groups using a “mobile-health wallet (m-health wallet) which is a mobile platform dedicated saving and spending for healthcare expenses only. The study explores secondary data collected during a study that introduced the m-health wallet savings product among low-income earners who are members of 20 Rotating Savings and Credit Associations (ROSCAs) in Nairobi and Uasin Gishu counties. Data from the m-health wallet platform from the 208 ROSCAs members were collected and the present researched analyzed- using multiple linear regression analysis and Student's independent sample t-test - the effect of different types of financial incentives on savings’ levels; and using the differences in savings between rural and urban areas. Findings from the study indicate that financial incentives did not result in increased savings and that ROSCAs in urban areas saved more than those in rural areas.



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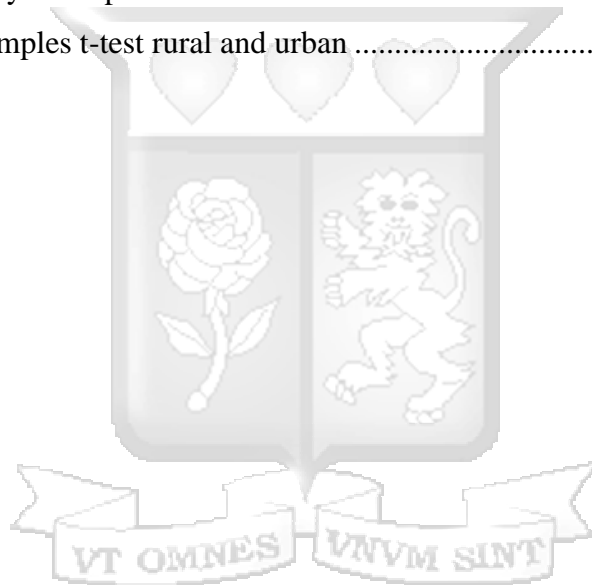
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LIST OF ACRONYMS

ADD	American Dream Demonstration
BoP	Bottom of the Pyramid
FSD	Financial Sector Deepening
NGO	Non-Governmental Organization
NHIF	National Hospital Insurance Fund
OOP	Out of Pocket Payment
ROSCA	Rotating Savings and Credits Accounts
SDGs	Sustainable Development Goals
UHC	Universal Health coverage



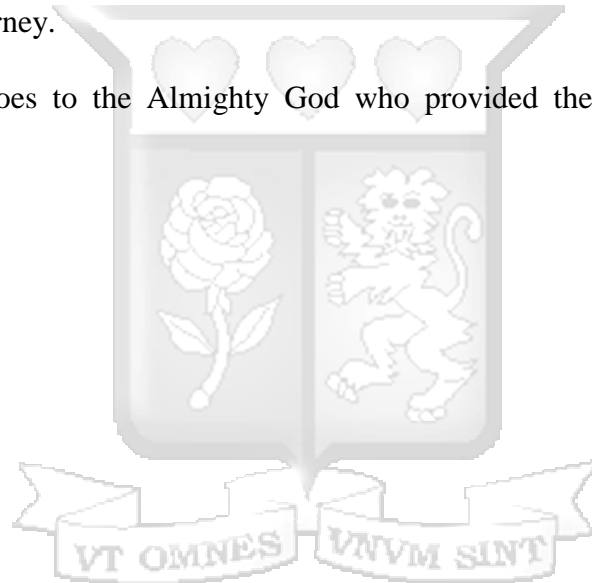
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CHAPTER 1: INTRODUCTION TO THE STUDY

1.1 Introduction

The Kenyan health sector relies heavily on out-of-pocket payments (OOP) which represent almost 26.6% of Kenya total health expenditure (Ministry of Health, 2015). OOP remain the main form of fragmentation in the Kenyan health system and this leads to high inequity in access to health services. Each year, Kenyan households spend over a tenth of their budget on health care payments. The burden of out-of-pocket payments is highest among the poor. The poorest households spent a third of their resources on health care payments each year compared to only 8% spent by the richest households (Chuma & Okungu, 2011). In other words, close to 2.6 million Kenyans (6.2 %) of households are at risk of impoverishment as a consequence of expenditure on health care depleting household savings and were at a risk of falling into poverty (Ministry of Health, 2015).

The need to provide quality and equitable health services and protect populations from impoverishing health care costs has pushed universal health coverage (UHC) to the top of global health policy agenda. UHC is a priority policy agenda worldwide and is one of the Sustainable Development Goals (SDGs). The SDG3, where UHC falls, is driven by the need for improved access to quality health services for all and protection of the population from catastrophic and impoverishing health care costs (Okungu et al, 2017). In Kenya, government health policy has prioritized contributory financing strategy as the main financing mechanism for UHC through the Government National Hospital Insurance Fund (NHIF), which is the largest insurance provider in the country.

Despite tremendous reforms from the Government and NHIF to improve access to insurance coverage among its most vulnerable population, the health insurance uptake among the poorest quintile remains low. According to the Business Call to Action Coalition report (BCtA, 2016), that uptake is estimated at 2.9 per cent, compared to 41.5 per cent in the wealthiest quintile. Within the insured fraction of the poorest quintile, the NHIF covers the majority (92.5%), while private health insurance providers and community- based health insurance schemes cover only 3.6 per cent and 3.4 per cent, respectively. Whereas the uptake of insurance coverage within the poorest quintile

has doubled since 2007, when it stood at 1 per cent, in terms of absolute numbers, this increase is only modest compared to the increase in the wealthier quintiles. For instance, insurance coverage in the fourth and in the wealthiest quintiles currently stands at 25.4 per cent and 41.5 per cent, respectively, compared to 11.2 per cent and 26.4 per cent, respectively. These statistics confirm that people at the Bottom of the Pyramid (BoP) are more vulnerable to the impoverishing consequences of ill health than the wealthier quintiles. Households without insurance cover are often forced to pay substantial medical bills out-of-pocket when seeking medical care. These payments interrupt their living standards and may even push them further into poverty.

Many studies show that there is an enormous need for more diverse financial service options that will help people manage short-term liquidity and long term investment in the face of tremendous uncertainty in their incomes and consumption needs – unforeseen healthcare expenses being a major example of a significant unexpected household consumption need (FSD Kenya, 2014). Access to preventive or curative effective health products, has been limited due in large part to poverty and the absence of financial markets that would enable poor households to invest in health on credit. Given such constraints, poor households should save in anticipation of future health shocks. However, substantial evidence suggests that they lack adequate savings products, and, as a result, households are quite vulnerable to health shocks. In order to afford medical expenditures, they resort to drawing down productive assets or business capital or to other costly risk-coping strategies (Dupas & Robinson, 2013). The Medical or Health Savings accounts are some of the products introduced to address health inequity in some parts of the world. These products which emerged in response to concerns of escalating healthcare costs in developed countries, consist of individuals saving and paying for their own medical need (World Health Report, 2010). However, these products, which have a limited penetration in Africa (only in South Africa) have mainly been implemented in the formal sector through tax incentives.

In Kenya, health savings products for the BoP also needs to leverage on mobile technology. The potential for mobile money to transform healthcare accessibility among low-income groups is enormous, tapping into extensive mobile infrastructure to reach the 1.7 billion unbanked people who have mobile phones. Kenya is witnessing an unprecedented uptake of mobile money technology in terms of the number of mobile money subscribers, number and value of transactions as well as the number of agents. According to latest statistics from the Central Bank of Kenya, as

at April 2015, the country had 26.13 million mobile money transfer customers, who completed 84.91 million mobile money transactions cumulatively valued at KES 213.75 billion (\$2.4 billion) (Central Bank of Kenya, 2015). In 2014, a total of KES 2,371.8 billion (\$26.8 billion) was transacted through mobile money platforms, implying that approximately 43.3 per cent of the country's GDP is transacted through these platforms. According to Mobile for Development (M4D) impact tracker and GSM Association (GSMA), the number of mobile money services that increase access to health tripled between 2009 and 2014. In Kenya, mobile money is increasingly finding application in increased access to health to people at the BoP. This has been driven largely by two factors: the accessibility to mobile phones by people at the BoP; and the acceptance of mobile money as a payment method. A study conducted by GSMA revealed that 60 per cent of Kenyans earning less than \$2.50 per day have access to a mobile phone (Seale, 2009).

A study conducted on the current role of M-PESA- the Safaricom mobile-money product- in facilitating access to health services in Kenya, showed the following: (i) the mobile-money product is already used to mobilize funds quickly to receive health care;(ii) most use of M-PESA for payment of treatment is indirect;(ii) Health care providers are incorporating M-PESA into their service provision models to increase access. As such M-PESA can play a crucial role in the health sector through two ways: first, to quickly mobilize funds from friends and relatives in order to seek timely health care, and second to facilitate transfer of funds to meet travel costs to the hospital and to pay for the health care. The study also recommends that through introduction of low-cost savings products, such as health savings cards, M-PESA platform could bring benefit to low-income Kenyans whether or not they receive any remittances (Haas & Nagarajan, 2011).

A Financial Diaries study conducted in Kenya (FSD Kenya, 2014) confirms the low usage of formal or informal savings tools as we hardly see anyone saving for future healthcare expenses. They do put money aside (' earmark') for emergencies or unexpected expenses for any kind, but also these cases account to less than 16% of the saved amounts in Kenya. To understand how low-income families can be triggered to save for health, a research project in rural Kenya (Dupas & Robinson, 2015) designed multiple savings devices with stronger and softer commitments to save for preventive health or health emergencies. Their main conclusions were: (1) simply providing a safe place to keep money was sufficient to increase health savings by 66 percent, (2) adding an earmarking feature was only helpful when funds were put towards emergencies, or for individuals

that are frequently taxed by friends and relatives and (3) group-based savings and credit schemes have very large savings effects.

In 2013, two organizations developed a mobile- health wallet (m-health wallet) that restricts the use of mobile money to pay bills at a limited set of healthcare providers. The development of this m-health wallet was based on the potential identified by mobile money product such as M-Pesa can have on health savings and expenditures. M-Pesa is known for its fast, reliable and cost effective way to transfer payments and remittances between persons and businesses across the country. An M-Pesa based system can play a crucial role in the health sector through two pathways: (i) to quickly mobilize funds from friends and relatives in order to seek timely health care, and (ii) to facilitate transfers of funds to meet travel costs to the hospital and to pay for the health care. The increased speed of payment can have positive effects on the health of the individual as well as potentially reducing the overall costs of treatment by preventing potential further deterioration of the condition. It can also decrease the amount the individual and caregivers spend away from other productive work. Not to forget that immediate payment for received health services helps to keep down the costs of the health care provider and allows the organization to provide better-quality services. To date, the use of M-Pesa for attaining health services has been primarily indirect – users receive funds through M-Pesa and cash out the money to pay for services independent from the providers (Haas & Nagarajan, 2011).

It is in this context of low insurance penetration but high potential for innovative mobile –based health pre-payment products, that the study was conducted.

1.2. Statement of the problem

Currently risk pooling in Kenya is minimal and hence, cross-subsidisation is very limited. Apart from tax funding, other forms of pooling include the NHIF, private health insurance, Community Based Health Insurances and to some extent donor funding where funds are channelled through the general budget support. While the value of risk-pooling or saving for health purposes can be particularly high, many researchers don't yet see low-income families in developing countries save to deal with the financial consequences of illnesses (c) while they do take credit in case of health emergencies. Furthermore, with little access to funds among the poor to afford preventative care and high incidence of diseases, many Kenyans find themselves in a situation where emergency medical care is necessary but not unaffordable with funds on hand.

To date, studies analyzing the effects of financial incentives on health, from a demand-side perspective, mainly focused on evaluating their impact on health seeking behavior or health outcomes. Indeed, most researches have analyzed demand-side financing or financial incentives' strategies used such as cash transfer programs, microcredit, user fee removal policies and voucher schemes (providing direct or indirect monetary incentives to households) on health seeking behavior and health outcomes (Gopalan et al., 2014). In addition, these demand-side financing programs cannot be assimilated to direct financial incentives.

With a focus on the informal sector in Africa, this study investigated the effect of a more or less similar concept using an innovative technology solution: the so-called mobile-health wallet (or m-health wallet). The m-health wallet is a mobile platform that connects patients with healthcare providers and payers. The product was launched in Kenya with "M-TIBA" as a brand name. From the patient perspective, the m-health wallet is a wallet on a mobile phone (feature phone or smartphone) containing specified entitlements for healthcare. It is open for any sponsor to contribute any amount or benefits for any healthcare purpose for any Kenyan. Donors can provide certain healthcare benefits (e.g. maternal, chronic, malaria) to certain segments of the population. Family members can remit money for designated healthcare usage of individuals. Individuals or savings groups such as Rotating Savings and Credit Associations (ROSCAs) may use the m-health wallet to save collectively for healthcare. The study investigated the effects of introducing the m-health wallet to ROSCAs as a mobile-health savings product. ROSCAs normally save on a weekly, bi-weekly or monthly-basis and function like "Merry go round" (every round another member receives the pot of savings). Selected ROSCAs were offered the opportunity to use the

m-Health wallet to save a certain amount of money for health expenses. The amount was agreed upon as a group but for individual use.

The m-Health Wallet savings product was introduced to low-income earners who are members of ROSCAs in Nairobi and Uasin Gishu. Different financial incentives were introduced to observe uptake and if the use of the m-Health Wallet is viable amongst the targeted groups. This would enable these ROSCAs members to access and pay for health care services without having to rely on available out of pockets.

1.3. Research objectives

The main objective of the study was to analyze the effects of financial incentives on health savings and explore their effectiveness in addressing health needs during the study period.

The research specific objectives were the following:

- I. To establish the existence or lack thereof of differences in savings between the incentive groups;
- II. To compare the effect of financial (monetary) incentives among other variables on health savings' levels;
- III. To analyse differences in health savings between urban and rural areas

The research questions were the following:

- i. Does financial incentive trigger increased health savings?
- ii. How are financial incentives influencing health savings in comparison with other variables?
- iii. Are there any differences between health savings in urban and rural areas?

1.4. Scope of the study

The study was implemented among 20 existing ROSCAs in the slum areas of Nairobi and 20 ROSCAs in the rural areas in Uasin Gishu. Both areas were selected for the following reasons: (i) presence of network of health facilities supporting the m-health wallet solution (they were connected and staff trained on the m-health wallet system) and (ii) the areas were inhabited by low-income earners who are mostly non-insured groups targeted for health savings' product. They were also selected because of the presence of health facilities supporting the m-health wallet solution. This selection will allow for a fair representation of ROSCAs health savings and seeking behaviours in both rural and urban areas among low-income target groups.

1.5. Significance of the Study

Findings from the study were deemed essential in helping to improve people's (working poor) ability to deal with unforeseen health events as financial preparedness is an essential element of access to healthcare. Not only will the intervention help avoid financial shocks when falling ill. It will offer alternative choices to beneficiaries among to access private providers where treatment could potentially be received at closer proximity and/or with less waiting time and/or at better quality than the public sector. The study will also be beneficial for health organizations (public, private or NGOs) interested in designing affordable health covers for low-income groups. Especially with the current political drive for reaching Universal Health Coverage in Kenya and Africa, the study will provide some insights of both public and private players in this arena. Finally yet importantly, this study will also be of interest for organizations targeting ROSCAs with financial products that could also include health components in their offers.

CHAPTER 2: LITERATURE REVIEW

The following part discusses the earlier theoretical and empirical literature relating to saving behavior challenge and potential in low-income groups.

2.1. Theoretical literature

2.1. 1. *Saving behavior theories*

Saving is generally referred as a portion of an income that a business or an individual remains with after consumption. According to Lunt, “Saving represents that part of income which is reserved for future use and may therefore serve to create enduring wealth” (Lunt, 1996).

The Life-cycle hypothesis introduced by Modigliani and Brumsberg (1954) is one of the most important economic saving theories. The main concept of the life-cycle hypothesis is that individuals or households try to keep their expenditures constant over the life-cycle: when income is lower than expected average life-cycle earnings, money would be borrowed; when income is higher than expected, the surplus would be saved. In other words, people are expected to optimize expenditure over their life span (Deaton, 2005).

Although the life-cycle theory attempts to predict differences in saving behaviour over the life cycle, other studies (King, 1985; Juster, 1986; Thaler, 1990, 1992) were not able to confirm the expected saving behaviours of individuals or households at different stages in the life cycle; for instance the young and old people did not behave as expected (Wärneryd, 2000).

Indeed, as mentioned by Hungerford (Hungerford, 2006) economic reasons start from the premise that individuals and families are rational and make optimal decisions about consumption and saving throughout the life course. However behavioral reasons start from the premise that individuals and families do not always make optimal decisions regarding consumption and saving. While most studies have focused on modeling lifetime resources and preferences in the way that best captures characteristics of individuals and the economic environment, including the fact that predictions about the future are uncertain, the life-cycle hypothesis did not take into account the fact that refraining from consumption and making saving decisions may be very difficult. Indeed, individuals are faced with several challenges: they may have to spend a lot of time and effort collecting information required to make saving decisions; they may lack the financial literacy enabling to perform the calculations required for devising their saving plan. (Michaela & Otto, n.d.)

It is the behavioural life-cycle model (Shefrin & Thaler, 1988) that acknowledges that saving is difficult. This hypothesis is linked to the life-cycle hypothesis but incorporates self-control, mental accounting and framing (how alternatives are perceived from a chosen point of reference). And as such is closer to modelling the real man (versus the economic man).

2.1.2. Saving and self-control problem

Several theories acknowledging psychological barriers to saving practices, especially in low-income settings have been put forward.

The model of hyperbolic discounting model defined by Herrnstein (1961) describes individuals as being present-oriented, with more regard for current or immediate satisfaction rather than delayed satisfaction. As a result, people end up delaying certain decisions, such as saving mechanisms. Given two options, humans tend to show a preference for a more immediate, smaller value reward rather than waiting for a later, higher value reward (Rubinstein, 2003). This conflict of time preferences results in hyperbolic discounting, or intertemporal preferences (Angeletos, Laibson, Repetto, Tobacman, & Weinberg, 2001). In addition, psychological factors, such as impatience and issues of self-control (involving competing preferences dictating different actions at different times) may influence savings negatively.

Self-control problems were found much higher among the BoP and credit constrained because the cost of deviating from personal rules is limited when one has very little to lose. Banerjee and Duflo (Banerjee & Duflo, 2006) argue that there are “temptation goods” (goods whose consumption yields utility in the present, but whose future consumption yields no utility), which serves as a “temptation tax” on savings. If there is satiation in temptation goods such that their consumption share declines with income, then a poverty trap can emerge since poor people face a higher effective tax and therefore have a lower incentive to save than richer people. Both theories are consistent with studies which find demand for some form of commitment among people in developing countries (Nava et al., 2006), (Duflo, Kremer, & Robinson, 2011), (Brune et al., 2013). This review of theoretical literature indicates that when studying savings’ behavior among the low-income population, one must consider the behavioral theories rather than classical economic theories. These latter emphasize the psychological and socio-economic barriers that influence human beings in making their financial decisions for saving.

2.2. Empirical review

The study investigated the effects of introducing monetary incentives in a context of group savings (ROSCAs) using a commitment device earmarked for health (m-health wallet). The objective here is to combine different tested interventions meant to increase savings. This section provides a review of findings from different experiments conducted to influence savings especially among the poor.

2.2.1. *Effects of incentives on savings*

According to Hungerford (Hungerford, 2006) there have been many empirical studies to test why people save in an economy based on these theorist. Many reasons were given depending on various factors such as age, gender, educational background, income level, family size, culture, and religion. John Maynard Keynes (1936) argued that there are eight primary reasons or motives leading individuals to save:

- Precaution motive: “To build up a reserve against unforeseen contingencies
- Foresight motive: “To provide for an anticipated future relation between the income and the needs of the individual or his family different from that which exists in the present,”
- Calculation motive: “To enjoy interest and appreciation,”
- Improvement motive: “To enjoy gradually increasing expenditures,”
- Independence motive: “To enjoy a sense of independence and the power to do things,”
- Enterprise motive: “To secure a masse de manœuvre to carry out speculative or business projects,”
- Pride (bequest) motive: “To bequeath a fortune,” and
- Avarice motive: “To satisfy pure miserliness.”

The proposed study focuses on the **calculation motive** to save, translated in monetary (financial) incentives in the context of an enforced commitment to save (through ROSCA and locked box device). A study conducted in Uganda suggests that Wealth, proximity to financial institutions, financial education, and financial incentives are positively associated with higher saving performance. (Chowa, Masa, & Ansong, 2012). These findings are aligned with results from similar studies conducted in the United States. Therefore financial incentives can be considered as a method to encourage savings for health.

However saving for healthcare costs, which the study focused on, falls under the “precautionary” motive for saving. (Ziegelmeier, 2012) established various factors that significantly affect precautionary motive of saving. They are defined as motives arising from uncertainties concerning future income and/or expenditures. These factors are income fluctuations, health risk, longevity risk, current income, education, etc. According to Ziegelmeier, precautionary savings in the US increase by 10.9% for a household with significant income fluctuations compared to a household with no income fluctuations, holding all other factors constant. But the results indicated that health risk does not significantly affect precautionary motive of saving. He stated that “poor expectations about the future health status do not change precautionary savings significantly”. As such there is a need to also consider what other motive can increase saving for health.

Engen, Gale, Bernheim, and Slemrod (1994) in an assessment of the saving patterns in the United States posit that the saving trend in the country has been on the decline with an observed rate of 8% average savings in 1950s to an average rate of 4.6% as of the early '90s. The trend therefore indicates that there likely would be a decline in financed investments and curtailed economic growth. In addressing these concerns, the authors focus on saving incentive plans for personal savings. The authors specifically assess the efficacy of various saving incentivization models. Findings from their study indicate that incentivization programs cannot be inferred, on the whole, to be effective; the specific structuring on the incentivization plan, rather than mere existence of the same, informs the success or ineffectiveness of the approach. Findings from this exposition on incentivized saving therefore indicate that focusing on healthcare savings, it is necessary to ensure that various nuances involved in incentivization programs are robustly investigated so as to generate a model factoring in the various variables that affect the efficacy of the saving initiative.

In the context of the study, additional incentives to save are the so-called “commitment devices”: the ROSCA saving structure and the m-health wallet. According Gugerty (Gugerty, 2007), the psychology literature presents several mechanisms, both intra and extra personal to encouraging commitment for savings. Intrapersonal mechanisms include behavior such as removing the temptation from sight or making private rules with oneself governing behavior. Extra-personal mechanisms may include physical or social constraints on future choices, such as opening a savings account. An important point is that commitment devices, by tying the hands of individuals, may also make it easier to resist demands for sharing with their social network.

(Gugerty, 2007) (Anderson & Baland, 2002) provide evidences that ROSCA are regarded as a

saving commitment device. Gugerty says that key feature of ROSCAs is their public nature and the inflexibility of their organization. Payments are made publicly, and groups monitor and enforce an individual's payments to herself as well as her payments to the group. Many ROSCA participants also "bind their hands" through the use of a pre-commitment mechanism in which participants agree in advance on how they will use their funds and the group monitors the individual to ensure that she honors her commitment. Finally, most ROSCA participants report that they join ROSCAs in order to commit themselves to saving, "to get the strength to save." Thus the inflexibility of ROSCAs is precisely the feature that is most valued by participants.

A study conducted among BoP ROSCAs in Kenya demonstrates that some of the funds saved in ROSCAs are used to finance health expenditures. In other words, ROSCAs can be considered as a mitigation mechanism for households to rely on to cope with health expenditures (Anand, n.d.). Taking into these studies, an experiment conducted by Dupas and Robinson (2013) among ROSCAs in Kenya suggests that introducing a commitment device as basic as a simple box with a lock and key allows the average individual to substantially increase the level of their health investment and as such to reduce household's vulnerability to health shocks. The study also established that the mechanism through which this simple safe box enables savings is through a mental accounting effect. The money put into the box was mentally labeled by respondents as "for savings" and therefore less fungible, and as such was less likely to be spent on luxuries or given away to others. Usage of the box remained high for at least 33 months after it was introduced. The study also demonstrated that a combination of simple storage mechanisms, earmarking for the savings for health purpose and social pressure from ROSCAs to save consistently had large impacts on health savings. Indeed this combination led to an increase of up to 138% in preventative health investment.

A previous (internal) study conducted by one of the organization supporting the M-TIBA product indicated that ROSCAs members preferred the following incentives to save for health:

- a start-up amount for free;
- a percentage top-up when you have reached a certain level of savings;
- a bonus amount when you have reached a certain level of savings (this can also be given as free airtime);
- an interest on savings;
- an option of taking a m-health wallet loan.

The study assessed the efficacy of introducing different “interest on savings” to encourage savings for health among ROSCAs.

2.2.2. Effects of financial incentives in savings for health or better health behaviors

While conducting the proposed research, it is important to be aware that financial incentives in relation to changing behaviors can have a counter-effect. Corgnet (Corgnet et al., 2015) indicates that moving from no incentive to a positive incentive can dramatically change the framing of the interaction and shift an individual’s decision frame from social to monetary. For instance, in an experiment that involved students dragging a computerized ball to different parts of a screen, they find that those paid in candy do better than those paid in cash, presumably, because candy is a social reward rather than a monetary one. The differences between a social and a monetary reward may also change individuals’ beliefs about the behavior of others: for example, people may believe incentives are in place because the social norm is that people do not contribute.

In addition, Dan Ariely (Ariely et al., 2009) shows that image concerns are another important motivation for contributing to public goods: people volunteer, recycle, donate blood, or behave pro-socially to show others that they are “nice.” Extrinsic rewards can crowd out image motivation by diluting the signal to oneself or others of a voluntary contribution: it becomes unclear whether a person is undertaking a social activity to “do good” or to “do well.” These findings indicate that monetary incentives for prosocial behavior work better when contributions to the public goods are not as visible (perhaps like investments in an energy-saving or pollution-reducing water boiler) than when they are visible and presumably done partly due to image concerns. It also implies that incentives for voluntary contributions should be provided privately rather than publicly, to reduce the effect on image motivation.

Huskamp et al., (2003) assess the effectiveness of incentive-based formularies on prescription-drug utilization and spending. The authors focus on two groups differing in the mode of incentivization through differences in co-payments for different-tier drugs. The results of the study indicate that cost-saving incentivization plans had an anomalous effect on the utilization of drugs – in that the associated changes in copayments were viewed to alter out-of-pocket spending by enrollees, the frequency of use medications, and effectively, the quality of care. The findings from this study therefore indicate that the effects of incentivization through savings in healthcare are

diverse and therefore such incentives may not necessarily be efficacious in light of the intended purpose.

These are important findings to consider in a context of providing financial rewards to save for perceived “good practices” (healthcare) in a social environment such as ROSCAs.

2.2.3. Differences in savings among target groups

PJ Fisher (Fisher & Anong, 2012) indicates that evidence suggests that people know why they should save, but many don't save, especially lower-income individuals and families. Therefore difference in saving's behaviors can be observed between groups.

Ensor and San (1996) focusing on research data from a 1995 study conducted in Northern Vietnam highlight the effect of healthcare costs among the poor. The authors, employing a panel study approach, highlight that following the introduction of user fees for healthcare services, the poorest were observed to pay relatively higher fees as compared to richer individuals suffering similar conditions; this was mainly due to delayed treatment on account of inaccessible funds. The authors further posit that although the system allows for provision of subsidized healthcare for the most affected, the implementation of the same is mostly lacking as the poorest appear to be adversely affected. Among the effects of increased spending on healthcare, among the poor, as reported by the researchers, has been the allocation of previously budgeted funds to offset healthcare payments thereby resulting in further financial struggles. The implication of this study therefore, is that ill-fitting subsidiary plans implemented by the government may serve as on-paper solutions although the practical benefits of the same may be significantly lacking.

Kempson, et al. (2005) focus on incentivized saving plans with a particular focus on the Savings Gateway scheme initiated in Britain in 2003. The study highlights that matched saving schemes are commonplace in the United States, Canada, and Australia with the most notable being the American Dream Demonstration (ADD) program comprising 13 different Individual Development Accounts with the largest having 470 accounts opened. The aims of the different matched-savings schemes are varied ranging from incentivization to save for education to the purchase of homes. In general, the authors observe that the structuring of government-sponsored matched payments was such as to ensure maximum benefit for the poor with matched payments of up to \$3 for each

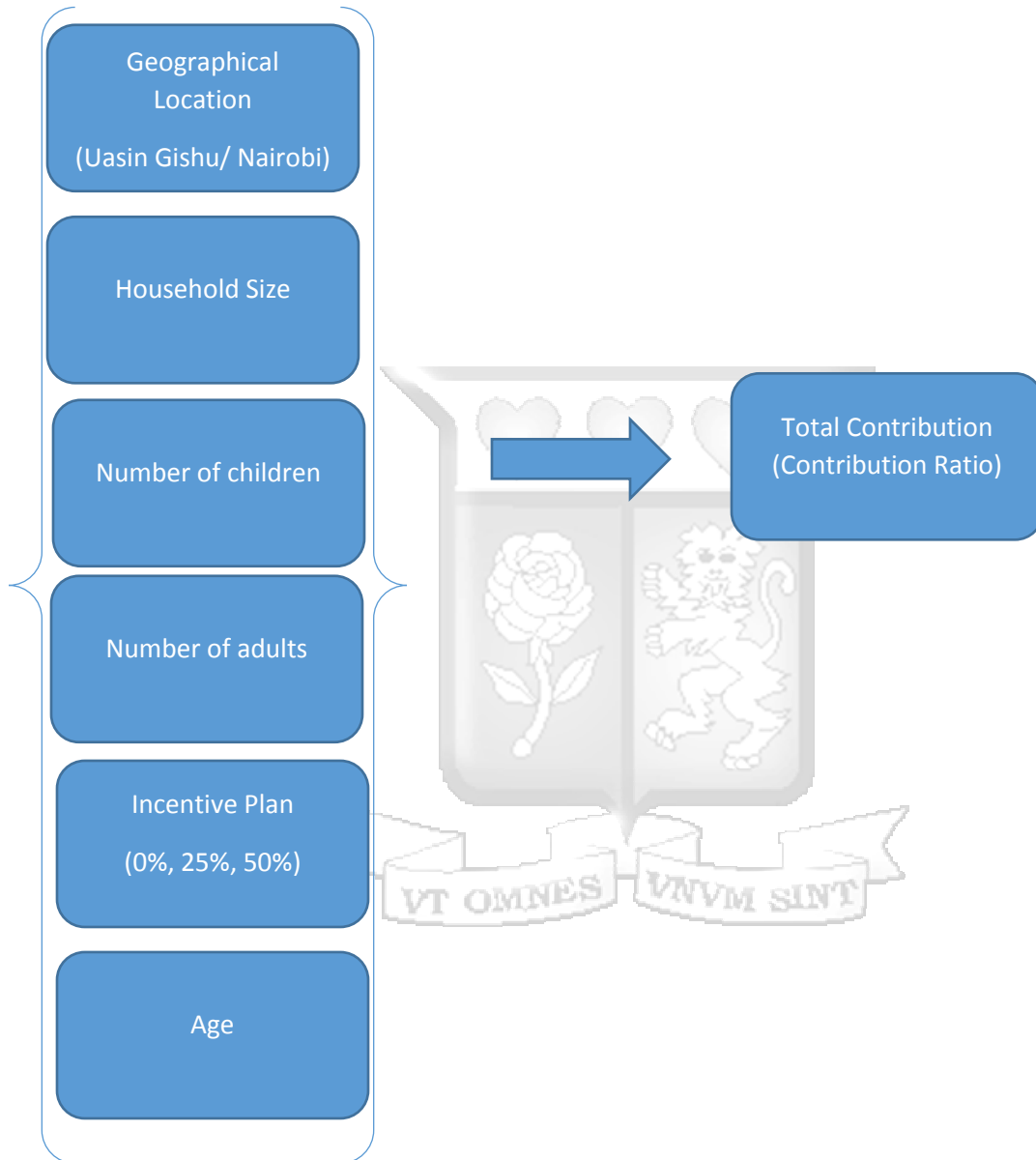
saved dollar. Findings from the ADD program suggest that low-income families are able to save but that additional income does not necessarily translate into additional savings.

In a related study, Hogarth and Anguelov (2003) further provide insights on the ADD program postulating that the savings- model put forward in the program provides evidence that the poor can save and that with sufficient restructuring in the approaches to saving, substantial gains can be achieved in offsetting healthcare-related expenditure from accumulated funds. These findings are relevant to the ongoing study as they point to the fact that the poor are able, under the right incentivization plan, to save. However, the findings also indicate that various underlying factors affect the saving patterns among poorer populations in that the expected "higher savings with higher income" trend isn't a forgone conclusion among the demographic.

Banerjee and Duflo (2007) provide a detailed account of the healthcare challenges faced by the poorest demographics across the world. The authors highlight that those living under \$1.08 per day – defined as extremely poor – consume, on average, slightly less than 1400 calories a day. Focusing on the poor population in Udaipur, India, the authors posit that up to 72% report at least one symptom of illness which has left them bedridden over the period of one year and that up to 55% of adults are anemic. In Peru, South Africa, East Timor and Tanzania, 11% to 15% indicate that a close relative had been bedridden over the period of one year with the figure rising to up to 46% in Nicaragua, Udaipur and Mexico. The findings from this study indicate the dire implications of poverty on healthcare. In relation to the study, it is evident that although the effects on healthcare are front-and-central to the most affected, incentivization programs may be curtailed by the low earnings of the demographic given that any additional income would more likely go towards addressing such immediate needs as scarcity in daily food than to healthcare plans. Considering these findings, from this study, research investigated whether differences in savings behaviors are observed between rural and urban areas given the difference in earnings between the demographics.

The literature review indicates that a number of key themes and variables were explored around the study; these are translated into the conceptual framework (figure 2.1) below:

Figure 2.1: Conceptual Framework



Operationalization of variables

The geographical location within which the study was conducted was dummy coded 1 for Uasin Gishu (rural area) and 0 for Nairobi (Urban area). Household size, number of children, number of adults, and age of respondents were included as discrete numerical variables whereas the incentive plans, 0%, 25% and 50% were further included as dummy variables with the 0% group forming

the base group; the two introduced variables – 25% and 50% - were coded, as necessary with 1 indicating presence of the respective plans and 0 absence. The dependent variable, contribution ratio, was computed by dividing the cumulative contribution of the individuals by the anticipated total based on their committed monthly contributions; this therefore standardized the contributions made by each individual.



CHAPTER 3: RESEARCH METHODOLOGY

3.1 Introduction

This study focused on the effects of financial incentives on health savings. Findings forthcoming from the study will serve to shed light on the appropriateness of different incentivization approaches and the contribution of other variables in determining the amount saved by ROSCAs towards healthcare. This chapter provides an elucidation of the nature of the study and the data to be collected, and the approaches that was applied in arriving at the research findings.

3.1 Study Design

The study involved of a quantitative analysis of secondary data collected from a research conducted among ROSCAs. These secondary data were obtained from the m-health wallet platform which displays the savings amounts per ROSCAs members (after 6 months of introducing the intervention). The quantitative research is based on the measurement of quantity or amount; it is applicable to phenomena that can be expressed in terms of quantity (Kothari, 2004). The study was exploratory in nature as it served to shed light on the applicability of different incentivization plans in increasing savings for healthcare (Sanders et al., 2011).

3.2 Population and sampling

The secondary data analyzed for this research were obtained from the previous study that covered 3 low-income areas in Nairobi (urban) being Mathare, Kawangware and Sinaï and 6 areas in Uasin Gishu (rural) being Maraba, Meteitei, Tachasis, Chemase, Serem and Kapsengere villages. It is important to note that from a previous study conducted by one of the participating organizations, it was found that 84% of ROSCA' members are women. These findings were taken into account in the sampling exercise to ensure collection of data from male ROSCA members. In determining the sample size, it was noted that a larger sample can yield more accurate results — but excessive responses can be pricey (Smith, 2013).

The size of the target population (ROSCA members in the areas of research) for this particular study was estimated at 10,000. This number was calculated from the lists of all registered ROSCA in the selected areas of research that the researcher partly received through the Ministry of Gender

and Social Services and partly through Community Health Volunteers active in the areas of research. When using a confidence level of 95% and accepting a margin of error of 5%, the appropriate sample size for the study was set at 370 as shown in the calculation below:

$$\text{Sample size} = \frac{\frac{z^2 \times p(1-p)}{e^2}}{1 + \left(\frac{z^2 \times p(1-p)}{e^2 N}\right)}$$

With:

N: population size= 10,000

e: margin of error= 5%

z: z-score= 1.96 (for 95% confidence level)

Among the 370 records collected, the data that could be utilized for this secondary analysis was sourced from a total of 208 respondents involved in mobile wallet incentivization program as data from 94 members were incomplete with changes in incentivization plans and missing incentivization schemes of up to two months in the study period. The data considered for the research under the 0% incentive, 25% and 50% incentives for a period of three full months and therefore formed the sample for the study. These therefore represented 75% of the total respondents in the study; and 56% of the anticipated sample size. Baruch and Holtom (2008) observe that there is growing apathy in response to academic data gathering approaches; The authors surmise, following an investigation of 1607 studies, that the average acceptable response rate is 52.7%. The response rate for the study was therefore deemed satisfactory in making inferences regarding incentivization plans for the study population – ROSCA's involved in the wallet (m-health wallet) incentivization program conducted in Uasin Gishu and Nairobi. The unit of study is the individual participating as part of a ROSCA. Below is an overview of the secondary quantitative data collected from the intervention study.

Table 3.1: Detailed breakdown of the quantitative sample

	Total	Total	Nairobi					Uasin Gishu					
	%	#	Mathare	Kawangware	Kangemi	Shauri Moyo	Kayole	Maraba	Metetei	Tachasis	Chemase	Serem	Kapsengere
ROSCA members TOTAL	100%	370	37	37	37	37	37	31	31	31	31	30	31
Nairobi	50%	185	37	37	37	37	37	0	0	0	0	0	0
Uasin Gishu	50%	185	0	0	0	0	0	31	31	31	31	30	31
Females	70%	270	27	27	27	27	27	23	23	23	22	22	22
Males	30%	100	10	10	10	10	10	8	8	8	9	8	9
Aged between 20-35 years	50%	185	18	19	18	19	18	15	16	15	16	15	16
Aged between 36-50 years	50%	185	19	18	19	18	19	16	15	16	15	15	15
HH Income KES 5k-10k	50%	185	18	19	18	19	18	15	16	15	16	15	16
HH Income KES 10k-20k	50%	185	19	18	19	18	19	16	15	16	15	15	15

3.3 Data Collection Methods

The study was retrospective in nature, therefore data collected was sourced from the wallet (m-health wallet) initiative's stock data. The data was collected directly from the m-health wallet online platform which provides real-time data on each transactions performed by the users. Not all the information collected was deemed applicable for the ongoing study; as such, identifying information and ROSCA-specific information was left out with the collected including the variables area of study, house-hold size, number of children, number of adults, age of respondents, incentivization plans and total payments made.

3.4 Data Analysis

Three objectives were studied - to establish the existence or lack thereof of differences in savings between the incentive groups; to evaluate the effect of financial incentives on health-savings levels; and to analyze differences in health savings between urban and rural areas. The first objective, to establish the existence or lack thereof of differences in savings between the incentive groups was analyzed through an independent t-test so as to establish the presence or lack thereof of statistically inferred difference between the means of the two populations. The second objective, to evaluate the effect of financial incentives on health-savings levels was addressed through a

regression analysis with the incentive approaches with dummy variables for the 25% and 50% incentive plans and 0% as the base group; this served to show the comparative effect of the incentivization plans by providing a regression equation depicting the effect of dummy-variable incentive plan and area within which the study was collected. The resulting regression equation was therefore be as depicted below:

$$CR = C_t + b_1A + b_2HHSize + b_3NC + b_4AD + b_5AG + b_6IP25 + b_7IP50 + e$$

Where

CR = Contribution ratio (total contribution/total expected contribution)

C_t = Constant term

b₁ = Area coefficient

A = Area of study (rural)

b₂ = HHSize coefficient

HHSize = household size

b₃ = Number of children coefficient

NC = number of children

b₄ = Number of adults coefficient

AD = number of adults

b₅ = Age coefficient

AG = age

b₆ = 25% incentive plan coefficient

IP25 = Incentive plan

B₇ = 25% incentive plan coefficient

IP50 = Incentive plan

e = error term



The third objective, to analyze differences in health savings between urban and rural areas was analyzed through an independent t-test assessing the means of the two populations – rural and urban – as well as through the regression equation utilized in the second objective; a dummy variable indicating the area where the study was conducted was included therefore providing a basis of comparison of the effect of location on the amounts collected under different incentivization plans. The variable was coded 1 for rural and 0 for urban.

3.5. Research Quality- validity, reliability and objectivity of the research

The retrospective data collection exercise for the study was conducted under strict supervision and is therefore inferred to be free of error or manipulation. The congruency in understanding between the researcher's intention and the respondents was confirmed through pilot studies; studies which shaped the eventual questions included in the research initiative. The questions were therefore deemed to measure what was intended to be measured and the replicability of the study was also ensured thereby deeming the data valid and reliable.

3.6. Ethical issues in research

3.6.1 Informed consent

Written informed consent to participate in the study were obtained from all the study respondents prior to participation in the study. Only participants who have read and understood the study information were allowed to make a decision for participation. A written consent was sought from them before the start of data collection. The research team ensured that all consent information was provided in understandable languages, and was translated in vernacular language where necessary.

3.6.2. Ethical clearance

Confidentiality and non-disclosure agreements were signed by the collecting body and all other parties privy to the information gathered. The data was also held securely by the respondents and subsequent non-disclosure agreements signed by all other parties initially unmentioned in the original signing. No personal information was therefore disclosed or used in the study hence the ethical integrity of the research initiative was maintained throughout the collection and analysis

process. Ethical clearance for the study was obtained from the Ethics Review Committee of Africa Medical and Research Foundation (AMREF), and approval from the research investigators was obtained to conduct further analysis on the secondary data.



CHAPTER 4: PRESENTATION OF RESEARCH FINDINGS

4.1 Introduction

This chapter provides an analysis and the presentation of data collected for the study. The study focused on retrospective data on ROSCA mobile-health wallet (m-health wallet) participants. The overall objective of the study was to evaluate the effects of introducing financial (monetary) incentives to healthcare savings. This chapter is delineated into four main sections – descriptive statistics; differences in savings between the incentive groups; effect of financial incentives on health-savings levels; differences in health savings between urban and rural areas.

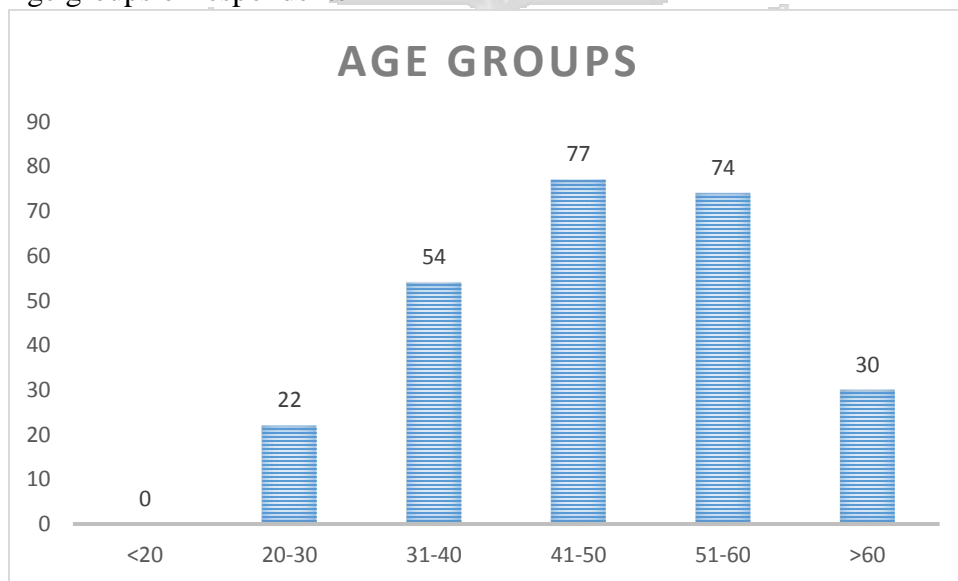
4.2 Descriptive statistics

This section provides a description of the individuals involved in the study. The section therefore serves to provide context for the inferences made in this chapter in response to the study objectives.

4.2.1 Age of respondents

In assessing the age of respondents, it emerged that the modal response category was 41 to 50 with 77 respondents. None of the respondents was below the age of 20. Figure 4.1 provides a summary of the different age groups and the various frequencies for each category.

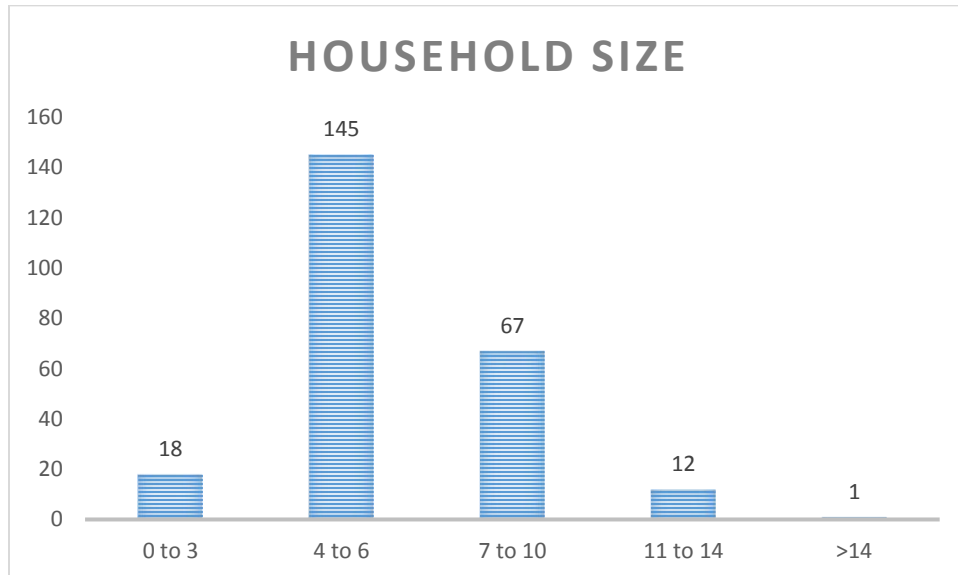
Figure 4.1 Age groups of respondents



4.2.2 *Household size*

Most of the respondents had four to six members in their households; this was the modal category. Only one respondent indicated more than 14 members within his/her household. Figure 4.2 provides a summary of responses in this category.

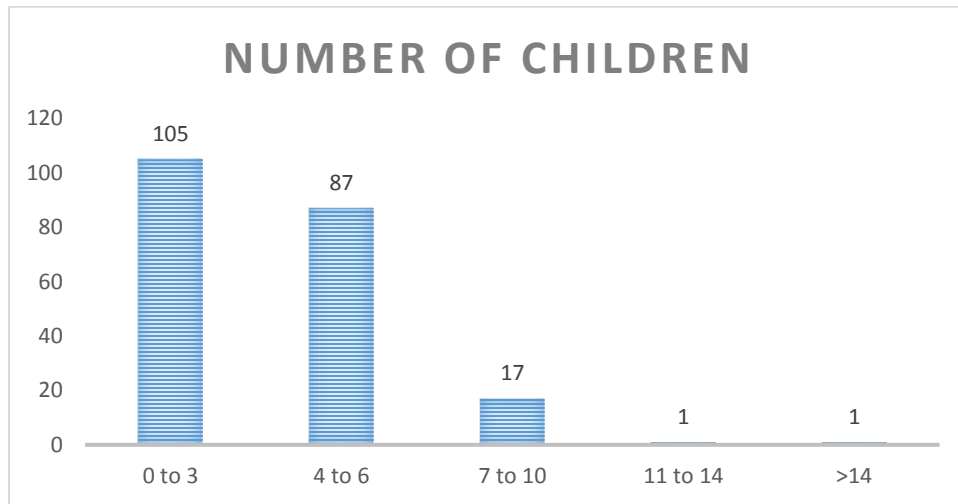
Figure 4.2 Household size



4.2.3 *Number of children*

The age group zero to three had the most number of respondents in the question assessing total number of children within households. Responses in this category were skewed to the right with most respondents indicating fewer than seven to ten children. Figure 4.3 provides a graphical representation of responses in this section.

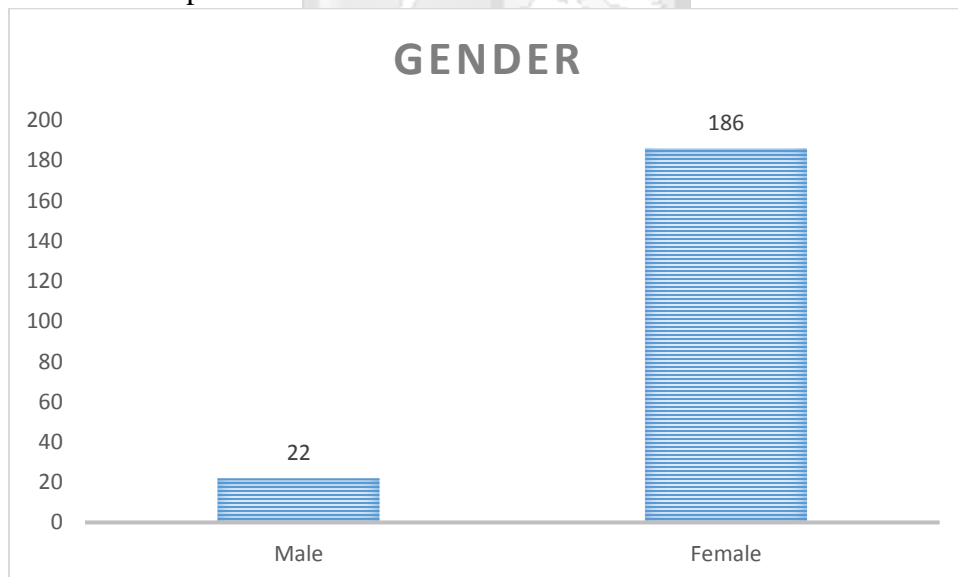
Figure 4.3 Number of children



4.2.4 Gender of respondents

Most respondents were female (186). The data therefore indicates a majority female participations in ROSCA and consequently, in the mobile-health wallet (m-health wallet) study. Figure 4.4. provides a summary of responses for this variable.

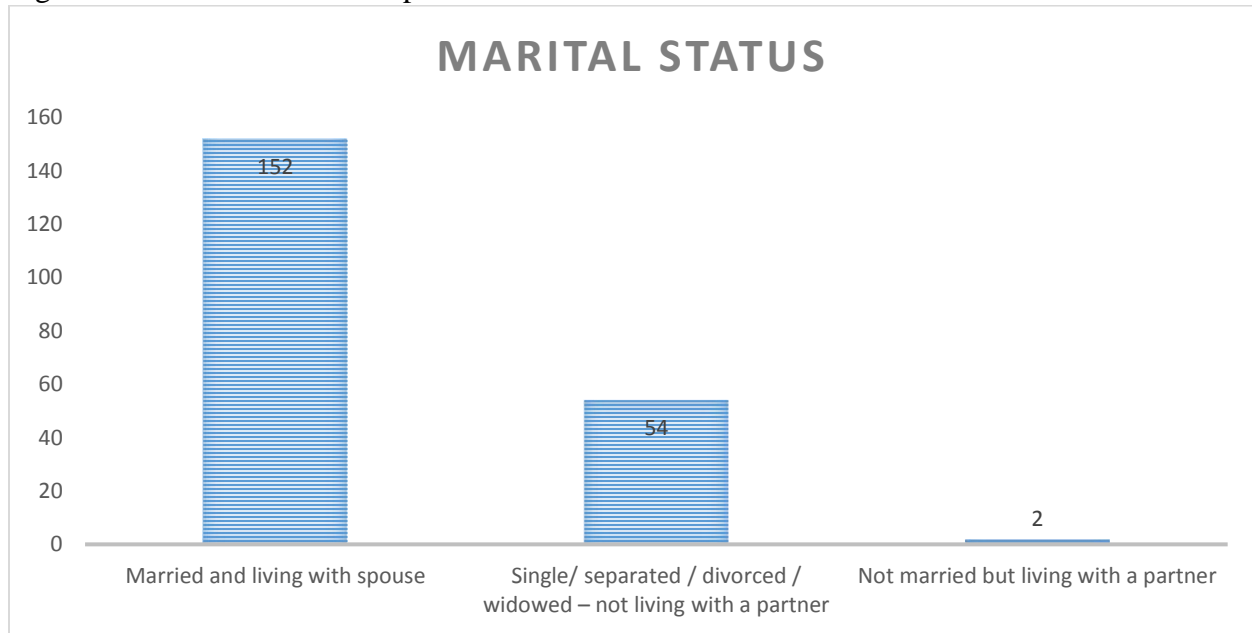
Figure 4.4. Gender of respondents



4.2.5 Marital status of respondents

Most respondents were married and living with their spouses (152 respondents). Only two of the respondents that participated the study for a period of three months under the specific incentivization plans were not married but living with partners whereas 54 were single or living alone. Figure 4.5 shows a summary of responses in this category.

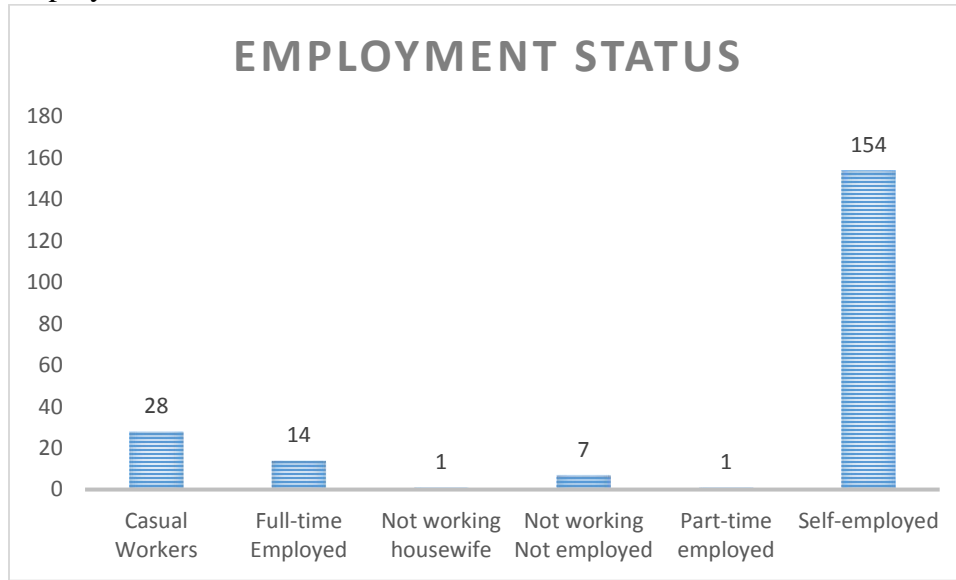
Figure 4.5 Marital status of respondents



4.2.6 Employment status of respondents

The modal category for this variable was "self-employed" with 154 respondents. The second most populous category was "casual workers" with 28 respondents. A summary of responses under this section is shown in figure 4.6.

Figure 4.6 Employment status



4.3 Differences in savings between the incentive groups

All three groups were assessed, by the means, to establish whether or not they were from the same population – a conclusion that would indicate that there was no significant difference in accumulated funds over the three-month period. For each pairing, Levene's test of equality of variance was conducted to indicate the t-statistic to be interpreted. The null hypothesis for the test indicated homogeneity of variance for the pair. The analysis output for the various categories are shown below.

4.3.1 Groups 0% and 25% incentive

The mean contribution ratio at 0% was 1.587 whereas that at 25% was 0.957. This therefore indicated better savings were reported for the 0-incentive category than for the 25% category. The analysis output further indicated that the difference between the two tests was significant with Levene's test indicating that the variance between the two groups was not equal. The interpreted t-statistic was therefore 3.439 with a p-value of 0.01 thereby indicating that the two samples were from different populations. Table 4.1 shows the group statistics and independent samples t-test output.

Table 4.1 Groups 0% and 25% incentive

Group Statistics						
		Incentive plan	N	Mean	Std. Deviation	Std. Error Mean
CONTRIBUTION RATIO		0.00%	75	1.587	1.572	0.182
		25.00%	45	0.956	0.183	0.027

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
CONTRIBUTION RATIO	Equal variances assumed	16.73	0.00	2.68	118.00	0.01	0.63	0.24	0.16	1.10
	Equal variances not assumed			3.44	77.30	0.00	0.63	0.18	0.27	1.00

4.3.2 Groups 0% and 50% incentive

The mean contribution ratio at 0% was 1.587 whereas that at 50% was 0.873. This therefore indicated better savings were reported for the 0-incentive category than for the 50% category. The analysis output further indicated that the difference between the two means was significant with Levene's test indicating that the variance between the two groups was not equal. The interpreted t-statistic was therefore 3.856 with a p-value less than 0.01 thereby indicating that the two samples were from different populations. Table 4.2 shows the group statistics and independent samples t-test output.

Table 4.2 Groups 0% and 50% incentive

Group Statistics						
		Incentive plan	N	Mean	Std. Deviation	Std. Error Mean
CONTRIBUTION RATIO		0.00%	75	1.587	1.572	0.182
		50.00%	88	0.873	0.338	0.036

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
CONTRIBUTION RATIO	Equal variances assumed	22.47	0.00	4.15	161.00	0.00	0.71	0.17	0.37	1.05
	Equal variances not assumed			3.86	79.84	0.00	0.71	0.19	0.35	1.08

4.3.3 Groups 25% and 50% incentive

The mean contribution ratio at 25% was 0.956 whereas that at 50% was 0.873. This therefore indicated better savings were reported for the 25%-incentive category than for the 50% category. The Levene's test indicated that the variance between the two groups was not equal. The interpreted t-statistic was therefore 1.826 with a p-value of 0.07 which was higher than the critical value 0.05 thereby indicating that the two samples were from the same populations. Table 4.3 shows the group statistics and independent samples t-test output.

Table 4.3 Groups 25% and 50% incentive

Group Statistics					
	Incentive plan	N	Mean	Std. Deviation	Std. Error Mean
CONTRIBUTION RATIO	25.00%	45	0.956	0.183	0.027
	50.00%	88	0.873	0.338	0.036

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
CONTRIBUTION RATIO	Equal variances assumed	9.990	0.000	1.520	131.000	0.130	0.08	0.05	-0.02	0.19
	Equal variances not assumed			1.836	130.56	0.070	0.08	0.05	-0.01	0.17

4.4 Effect of financial incentives on health-savings levels

To assess the effect of incentives, area of study, household size, number of children, number of adults and age of respondents, a regression analysis with contribution ratio as the dependent variable was run. The variables incentive, and area of study were included in the model as dummy variables. The output of the analysis is depicted in table 4.4.

Table 4.4 Regression analysis output

Model Summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.436 ^a	.190	.166	.935	.190	7.845	6	201	.000

a. Predictors: (Constant), SecondInc, Age, # Adults, Area, # Children, FirstInc

Coefficients ^a								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	1.855	.204		9.108	.000	1.453	2.256
	Area	-.571	.162	-.242	-3.527	.001	-.890	-.252
	# Children	-.043	.031	-.094	-1.391	.166	-.104	.018
	# Adults	.121	.051	.152	2.371	.019	.020	.222
	Age	.000	.001	-.029	-.457	.648	-.001	.001
	25%	-.386	.186	-.156	-2.073	.039	-.754	-.019
	50%	-.746	.151	-.361	-4.957	.000	-1.043	-.449

a. Dependent Variable: CONTRIBUTION RATIO



Excluded Variables ^a						
Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
						Tolerance
1	HH Size	. ^b000

a. Dependent Variable: CONTRIBUTION RATIO

b. Predictors in the Model: (Constant), SecondInc, Age, # Adults, Area, # Children, FirstInc

From the output, the adjusted R-squared value indicated that the model accounted for 19% of the variations in the dependent variable – contribution ratio. The variable Household size was excluded from the model whereas age and number of children were not significant.

Incentive plans were however surprisingly associated with an overall decrease in overall contribution. The 25% plan, controlling for other factors, had a coefficient of -0.386 whereas the 50% plan had a coefficient of -0.746; this therefore indicated that persons under no incentivization had higher contributions (over and above the expected contribution) than those under the incentive plans. This therefore indicates that the study did not successfully show that incentivization plans were associated with increase in contribution by the individuals in the program.

4.5 Differences in health savings between urban and rural areas

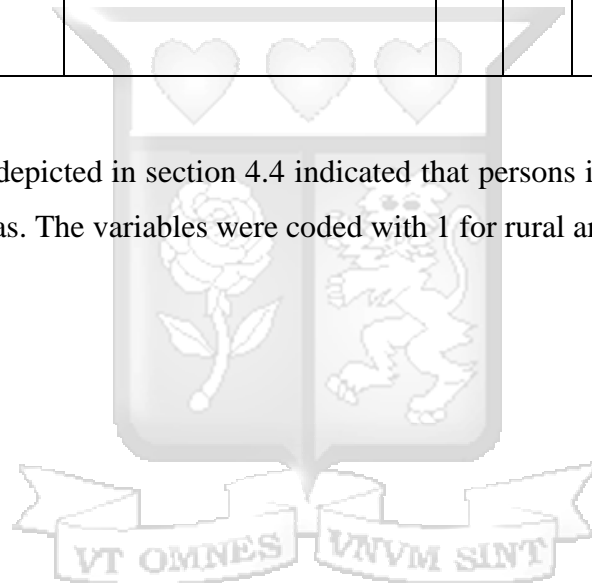
The mean contribution ratio for the rural population was 0.990 whereas that of the urban population was 1.622. This therefore indicated better savings were reported among the urban than the rural population. Levene's test indicated that the variance between the two groups was not equal. The interpreted t-statistic was therefore -2.330 with a p-value of 0.024 which was less than the critical value 0.05 thereby indicating that the two samples were from different populations. Table 4.5 shows the group statistics and independent samples t-test output.

Table 4.5 Independent samples t-test rural and urban

Group Statistics					
	Area	N	Mean	Std. Deviation	Std. Error Mean
CONTRIBUTION RATIO	1	156	0.990	0.219	0.018
	2	52	1.622	1.950	0.270

Independent Samples Test											
		Levene's Test for Equality of Variances		t-test for Equality of Means							
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference		
										Lower	Upper
CONTRIBUTION RATIO	Equal variances assumed	95.58	0.00	-3.99	206.00	0.00	-0.63	0.16	-0.94	-0.32	
	Equal variances not assumed			-2.33	51.43	0.02	-0.63	0.27	-1.18	-0.09	

The regression equation depicted in section 4.4 indicated that persons in urban areas saved more than those from rural areas. The variables were coded with 1 for rural area and 0 for urban area.



CHAPTER 5: DISCUSSIONS, RECOMMENDATIONS AND CONCLUSIONS

5.1. Differences in savings between the incentive groups

When comparing performance in savings between the different incentive levels, it surprisingly appears that higher savings were reported for the 0%-incentive category rather than the 25% and 50%- incentive categories. When comparing the 25%-category with the 50%- category, again it appears that the lower category of 25% performs better. In other words, higher incentives to save for health led to lower savings' amounts level. As mentioned by Gneezy, these findings go against what economists often emphasize “incentives matter”. The “basic law of behavior” would state that higher incentives lead to more effort to perform and in that case to improve savings' behavior (Gneezy et al., 2011). However Corngnet (Corngnet et al., 2015) also raised that financial incentives have two kinds of effects: the standard direct price effect, which makes the incentivized behavior more attractive, and an indirect psychological effect. In some cases, the psychological effect works in an opposite direction to the price effect and can crowd out the incentivized behavior. Moving from no incentive to a positive incentive can drastically change the framing of the interaction and shift an individual's decision frame from social to monetary. In addition, these results support findings from the Engel and al. (1994) study which highlights the complexity of incentivization plans and the need to cautiously structure them to avoid perverse effects. In a context of savings for “health” in a social savings group could be linked to the differences observed between a social and a monetary reward. Indeed these differences may also change individuals' beliefs about the behavior of others: for example, people may believe incentives are in place because the social norm is that people do not contribute.

The literature review also highlights the influence of extrinsic rewards in crowding out image motivation by diluting the signal to oneself or others of a voluntary contribution. In the context of saving for health, the ROCSAs members are saving for the health of their respective families, which could be considered as a private matter. These findings could imply that incentives for voluntary and private contributions should be provided confidentially rather than publicly, to reduce the effect on image motivation mentioned by Ariely.

5.2. Effect of financial incentives on health-savings levels in comparison with other variables

Finding of this study indicate that incentive plans are associated with an overall decrease by in savings in comparison to household size or number of children, which were associated with increase in savings. In other words, financial incentives have a perverse effect on savings levels. As mentioned by Keynes, there are multiple motives for saving. The calculation motive (which in the case of this study are the financial or monetary incentives) is listed as one among seven other motives for saving. The calculation motive for saving is explained as a way to enjoy interest and appreciation because a larger real consumption at a later date is preferred to a smaller immediate consumption. In view of the findings, one could assume that in the context of saving for health, the “precautionary motive” for saving would prevail rather than the calculation motive. Indeed a better knowledge and understanding of future health risks could be a stronger motivation factor than financial incentives only. As such, interventions sensitizing about future health risks such as health awareness campaigns, or so-called “information, education and communication” materials, etc. could have a higher impact on savings for health than financial incentives.

The study also finds that larger household size have a positive effect on savings. Therefore one could assume that larger households with higher number of members are faced with higher incidence of health events (especially with children under five) and are therefore more aware of health risks; which would lead them to be more inclined to save and protect themselves than households with smaller number of members. This is in line with the additional motives for savings indicated by Katona (1975) which list “children’s needs” as a key reason for savings.

The negative effect of financial incentives is also observed in task performance especially in the context of “Result-Based Financing” models. As indicated by Oxman (Oxman & Fretheim, 2008) financial incentives can have negative effects especially among individuals with lack of intrinsic motivation. According to him, Decreased intrinsic motivation negatively affects worker autonomy, purpose, altruism and competence. Some studies also indicate that monetary incentives produce poor performance. Therefore one could review the actual intrinsic motivations the ROSCAs’ members had for saving.

These results are more so unexpected in a context of saving as a group (ROSCAs with peer pressure to save) where a specific commitment device earmarked for health (m-health wallet),

which both interventions were meant to increase the discipline for saving. However one should also observe the intrinsic motivation, social perception of saving for a private matter as health in a social setting.

5.3. To analyze differences in health savings between urban and rural areas

Better savings were reported among the urban than the rural population. In addition, it appears that individuals in urban areas were more likely to contribute higher amounts than those in rural areas. This could be explained by the rural-urban financial inclusion gap. As indicated in the FSD FinAccess report, 2016, the usage of both formal and informal financial services providers, including ROSCAs, is higher in urban areas (informal services usage is 40.1% in rural vs 43.8% in urban).

It is worth mentioning that the lower levels of savings might be attributed to the lower threshold of savings selected per group. Urban savings' groups selected higher level of saving amounts as a group than their rural counterparts. However the ROSCAs selected were all selected from similar income groups. Main differences between the groups were economic activities: where urban ROSCAs members were mostly traders and rural ones were mostly farmers. The latter usually have seasonal income, which might have affected the savings' behaviors observed in the limited study period of 6 months.

5.4 Recommendations and conclusions

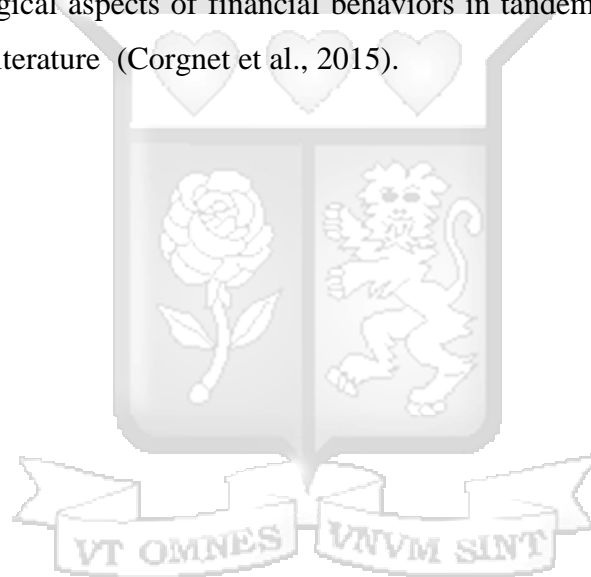
The study evaluated the effects of introducing financial (monetary) incentives in increasing health savings in a context among savings' groups using a "mobile-health wallet (m-health wallet) which is a mobile platform dedicated saving and spending for healthcare expenses only. Through a quantitative study, the m-health wallet savings product was introduced among low-income earners who are members of 20 Rotating Savings and Credit Associations (ROSCAs) in Nairobi and Uasin Gishu counties. Data from the m-health wallet platform among the ROSCAs members were collected and analyzed- using a simple regression analysis- to examine savings' behaviors (depending on the monetary incentives) and differences between savings categories and urban and rural areas.

Our findings suggest that the financial (monetary) incentives negatively affected the savings' levels; the higher the incentives, the lower the savings' amounts. Comparing to other variables,

such as the household size, number of children which positively affected the savings levels, the monetary incentives were found to have a perverse effect on the savings' behaviors.

In view of these unexpected results, the vast literature around financial and social rewards needs to be revisited. Although it has been strongly suggested that financial rewards are required to incentivize savings, it is important to structure it in a manner that takes into account the social context of ROSCAs.

Therefore, when introducing a health savings product among ROSCAs, managers and policy makers should care about both intrinsic and extrinsic incentives to induce and sustain desired financial behaviors such as savings. These findings reinforce the need to keep studying both economics and psychological aspects of financial behaviors in tandem as always postulated the Behavioral Economics Literature (Corgnet et al., 2015).



REFERENCES

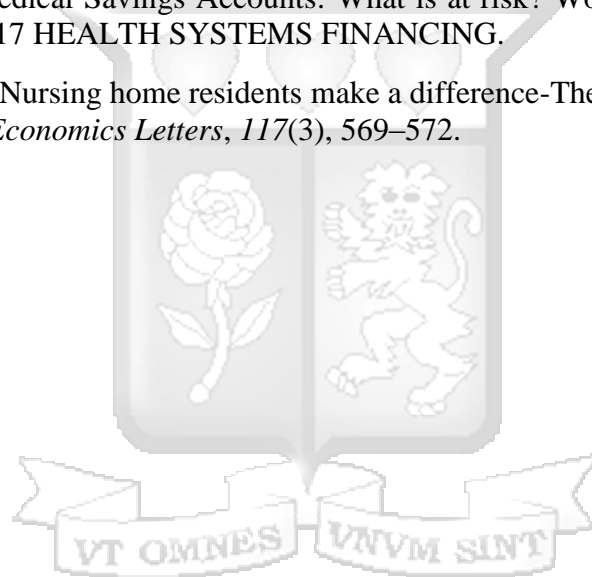
- Anderson, S., & Baland, J.-M. (2002). The Economics of Roscas and Intrahousehold Resource Allocation*. *The Quarterly Journal of Economics*, 117(3), 963–995.
- Angeletos, G.-M., Laibson, D., Repetto, A., Tobacman, J., & Weinberg, S. (2001). The Hyperbolic Consumption Model: Calibration, Simulation, and Empirical Evaluation. *Journal of Economic Perspectives*, 15(3), 47–68.
- Ariely, D., Bracha, A., & Meier, S. (2009). Doing Good or Doing Well?: Image Motivation and Monetary Incentives in Behaving Prosocially. *Am. Econ. Rev.*, 99, 544–555.
- Baicker, K., & Goldman, D. (2011). Patient cost-sharing and healthcare spending growth. *Journal of Economic Perspectives*, 25(2), 47–68.
- Banerjee, A. V., & Duflo, E. (2006). The Economic Lives of the Poor. Abhijit V. Banerjee and Esther Duflo October 2006. *Africa*, (October), 1–42.
- BCtA. (2016). BCtA: A Case Study on Mobile Money Platforms.
- Brune, L., Giné, X., Goldberg, J., Yang, D., Armendariz, B., Attanasio, O., ... Zeitlin, A. (2013). Commitments to Save: A Field Experiment in Rural Malawi *.
- Chowa, G. a. N., Masa, R. D., & Ansong, D. (2012). Determinants of Saving among Low-Income Individuals in Rural Uganda: Evidence from Assets Africa. *Advances in Applied Sociology*, 02(04), 280–291.
- Chuma, J., & Okungu, V. (2011). Viewing the Kenyan health system through an equity lens : implications for universal coverage. *International Journal for Equity in Health*, 10(1), 22.
- Corgnet, B., Gómez-Miñambres, J., & Hernán-González, R. (2015). Goal Setting and Monetary Incentives: When Large Stakes Are Not Enough. *Management Science*, 61(12), 2926–2944.
- Deaton, A. (2005). Franco Modigliani and the Life Cycle Theory of Consumption. *Macroeconomic Dynamics*, 4(2), 222–56.
- Duflo, E., Kremer, M., & Robinson, J. (2011). Nudging farmers to use fertilizers: theory and experimental evidence from Kenya. *American Economic Review*, 101(6), 2350–2390.
- Dupas, P., & Robinson, J. (2013). Why don't the poor save more? Evidence from health savings experiments. *American Economic Review*.
- Dupas, P., & Robinson, J. (2015). Why Don't the Poor Save More? Evidence from Health Savings Experiments (2013), 103(February), 1138–1171.
- Engen, E. M., Gale, W. G., Scholz, J. K., Bernheim, B. D., & Slemrod, J. (1994). Do saving incentives work?. *Brookings Papers on Economic Activity*, 1994(1), 85–180.
- Ensor, T., & San, P. B. (1996). Access and payment for health care: the poor of Northern Fisher, P., & Anong, S. (2012). Relationship of Saving Motives to Saving Habits. *Journal of Financial Counseling and Planning*, 23(1), 63–79.
- FSD Kenya. (2014). Kenya Financial Diaries: Shilingi Kwa Shilingi - The financial lives of the

poor, (August), 52.

- Gneezy, U., Meier, S., & Rey-Biel, P. (2011). When and Why Incentives (Don't) Work to Modify Behavior. *Journal of Economic Perspectives*, 25(4), 191–210.
- Gopalan, S. S., Mutasa, R., Friedman, J., & Das, A. (2014). Health sector demand-side financial incentives in low- and middle-income countries: A systematic review on demand- and supply-side effects. *Social Science & Medicine*, 100, 72–83.
- Gugerty, M. K. (2007). You Can't Save Alone: Commitment in Rotating Savings and Credit Associations in Kenya. *Economic Development and Cultural Change*.
- Haas, B. Y. S., & Nagarajan, G. (2011). M- - Pesa and Access To Health, (November).
- Hogarth, Jeanne M. and Anguelov, Chris, Can the Poor Save?. *Journal of Financial Counseling and Planning*, Vol. 14, No. 1, 2003.
- Hungerford, T. L. (2006). Saving Incentives: What May Work, What May Not.
- Huskamp, H. A., Deverka, P. A., Epstein, A. M., Epstein, R. S., McGuigan, K. A., & Frank, R. G. (2003). The effect of incentive-based formularies on prescription-drug utilization and spending. *New England Journal of Medicine*, 349(23), 2224-2232.
- Kempson, E., McKay, S., & Collard, S. (2005). Incentives to save: Encouraging saving among low-income households. Final report on the Saving Gateway pilot project, Personal Finance Research Centre, University of Bristol.
- Kenya's Health Expenditure. (n.d.). Retrieved April 25, 2018, from <http://www.health.go.ke/>
- Lunt, P. (1996). Discourses of savings. *Journal of Economic Psychology*, 17(6), 677–690.
- Macroeconomic Statistics. (2015). Retrieved from <https://www.centralbank.go.ke/>
- Michaela, A., & Otto, C. (n.d.). The Economic Psychology of Adolescent Saving.
- Nava, A., Dean, K., Wesley, Y., Ashraf, N., Karlan, D., Yin, W., ... Yin, W. (2006). *Deposit Collectors. Economic Growth Center, Yale University, Working Papers, 2005, 26 pp.* (Vol. 5).
- Okungu, V., Chuma, J., & McIntyre, D. (2017). The cost of free health care for all Kenyans : assessing the financial sustainability of contributory and non-contributory financing mechanisms, 1–13.
- Oxman, A. D., & Fretheim, A. (2008). *An overview of research on the effects of results-based financing. Report Nr 16-2008. Oslo: Nasjonalt kunnskapssenter for helsetjenesten.*
- Patel, D., Lambert, E. V., da Silva, R., Greyling, M., Kolbe-Alexander, T., Noach, A., ... & Gaziano, T. (2011). Participation in fitness-related activities of an incentive-based health promotion program and hospital costs: a retrospective longitudinal study. *American*

Journal of Health Promotion, 25(5), 341-348.

- Rubinstein, A. (2003). "Economics and psychology"? The case of hyperbolic discounting. *International Economic Review*.
- Seale, J. ; (2009). GSMA Report-Digital Inclusion. *Policy*, 14(3), 879–88.
- Shefrin, H. M., & Thaler, R. H. (1988). The Behavioral Life Cycle Hypothesis. *Economic Inquiry*, 26(4), 609–643.
- Smith, S. (2013). Determining Sample Size: How to Ensure You Get the Correct Sample Size. *Qualtrics*.
- Wärneryd, K.-E. (2000). The Psychology of Saving: A Study on Economic Psychology. *Wiley*, 153.
- World Health Report. Medical Savings Accounts: What is at risk? World Health Report (2010) Background Paper, 17 HEALTH SYSTEMS FINANCING.
- Ziegelmeier, M. (2012). Nursing home residents make a difference-The overestimation of saving rates at older ages. *Economics Letters*, 117(3), 569–572.



APPENDICES

Ethical Clearance approval letter



African Medical & Research Foundation
In Kenya

REF: AMREF – ESRC P184/2015

August 24, 2015

Babette van der Kloet
Ricochet Research
Email: babette@ricochetresearch.com
Phone: +27 (0) 73 2344 639 / + 254 (0) 72 039 1163

Dear Ms. Van der Kloet,

RESEARCH PROTOCOL: AN ASSESSMENT OF THE DEMAND AND UPTAKE OF THE MOBILE HEALTH WALLET CONCEPT AMONGCHAMA MEMBERS IN NAIROBI AND NANDI COUNTIES

Thank you for submitting your research protocol to the AMREF Ethics and Scientific Review Committee (ESRC).

This is to inform you that the ESRC has approved your protocol. The approval period is from 7th July 2015 to 7th July 2016 and is subject to compliance with the following requirements:

- a) Only approved documents (informed consents, study instruments, advertising materials etc) will be used.
- b) All changes (amendments, deviations, violations etc) are submitted for review and approval by AMREF ESRC before implementation.
- c) Death and life threatening problems and severe adverse events (SAEs) or unexpected adverse events whether related or unrelated to the study must be reported to the ESRC immediately.
- d) Any changes, anticipated or otherwise that may increase the risks or affect safety or welfare of study participants and others or affect the integrity of the research must be reported to AMREF ESRC immediately.
- e) Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period (attach a comprehensive progress report to support the renewal).
- f) Clearance for export of biological specimen or any form of data must be obtained from AMREF ESRC, NACOSTI and Ministry of Health for each batch of shipment/export
- g) Submission of an executive summary report within 90 days upon completion of the study. This information will form part of the data base that will be consulted in future when processing related research studies so as to minimize chances of study duplication and/or plagiarism.

Please do not hesitate to contact the ESRC Secretariat (esrc.kenya@amref.org) for any clarification or query.

Yours sincerely,

Prof. Mohamed Karama
Chair, AMREF ESRC

CC: Dr. George Kimathi, WASH Programme Manager, AMREF Kenya and Vice Chair AMREF ESRC
Samuel Muhula, Ag. Monitoring & Evaluation and Research Manager, AMREF Kenya

Winner of the