

**ACCESS TO CREDIT AND HOUSEHOLD SAVINGS IN KENYA  
EVIDENCE FROM KENYA NATIONAL FINACCESS 2019 SURVEY**

**BY**

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**DECLARATION**

**STUDENT’S DECLARATION**

This is my original work and has not been submitted for award of a degree in any other university.

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I confirm that this work has been done by the student under my supervision.

**SIGN** ..... **DATE**.....

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## **DEDICATION**

To my dear family. You have always had my back.

## **ACKNOWLEDGEMENT**

I would like to thank the Almighty God for sufficient grace and support throughout my studies and the writing of this research paper. I applaud Dr. Peter Muriu of University of Nairobi whose patience, professionalism, humility, and thoughtful comments and inputs have inspired me throughout the development of this research paper. Special appreciation to African Economic Research Consortium for the scholarship opportunity, I do not take it for granted. It would be quite dismissive of me if I do not register my appreciation to my family, classmates, and friends for their immense support and encouragement.

## **ABSTRACT**

Over the years, policy makers have embraced financial inclusion as a key policy and development tool. An inclusive financial system boosts savings, resilience to economic shocks, credit uptake hence investments, general welfare, economic growth, and poverty reduction efforts. For that reason, there have been concerted efforts amongst policymakers to promote financial inclusion across the globe. This has led to a global increase in the proportion of the financially included individuals. This study sought to investigate the effects of access to credit on household savings in Kenya. Specifically, the disaggregate access to credit facilities and usage of savings products, the effects of access to credit on household savings and other determinants of household savings in Kenya using the 2019 Kenya National FinAccess survey data. Estimation results revealed a negative effect of access to credit on household savings in Kenya. Other significant determinants of household savings in Kenya were income, education, gender, and age of the household head. The study findings implied that governments should ensure proper regulation of credit lending institutions against exorbitant interest rates that crowd out savings, educate households on usage of loans for economic generating activities and not for mere consumption, and enforce savings-first approach to lending.

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## **LIST OF ABBREVIATIONS AND ACRONYMS**

ARDL	Autoregressive Distributed Lag model
CBK	Central Bank of Kenya
CGAP	Consultative Group to Assist the Poor
CRB	Credit Reference Bureau
FSD	Financial Sector Deepening
GDP	Gross Domestic Product
KCB	Kenya Commercial Bank
KNBS	Kenya National Bureau of Statistics
MSME	Micro, Small, and Medium Enterprises
RCT	Random Control Trials
SURE	Seemingly Unrelated Regression Estimation
NASSEP	National Sample Survey and Evaluation Program



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## CHAPTER ONE

### INTRODUCTION

#### 1.1 Background

Financial inclusion<sup>1</sup> has been embraced by many developing countries as a key development tool (World Bank, 2005). An inclusive financial system boosts savings, resilience to economic shocks, credit uptake hence investments, household welfare, economic growth, and poverty reduction (Demirguc-Kunt et al, 2018; World Bank, 2014; CGAP, 2009; World Bank, 2008). For that reason, major steps have been undertaken to boost financial inclusion across the globe. This has seen a global increase in financial inclusion (proxied by the proportion of the population with deposit accounts in financial institutions) rise to 69% in 2017 up from 62% in 2014. As for developing countries, financial inclusion rose to 63% in 2017 up from 54% in 2014 (Demirguc-Kunt et al., 2018).

Cognizant of the role of the finance sector towards economic growth, savings mobilization, and poverty reduction, Kenya's policy makers have continually advocated for pro-growth financial sector reforms. In the country's vision 2030 development strategy, Kenya hopes to be a middle-income economy by 2030 with a sustained GDP growth rate of 10% (Government of Kenya, 2006). This will be facilitated by economic, social, and political pillars. Among other economic pillars required to achieve this goal is a savings rate of 30% and financial sector reforms to ensure the proportion of the financially excluded individuals reduces to less than 70% by the year 2030 up from 85% (Government of Kenya, 2006). Policy makers envision that financial sector reforms will increase financial inclusion and ultimately boost savings to GDP ratios.

Kenya has made meaningful progress towards financial inclusion. As at 2019, 89.2% of Kenya's population had access to formal financial services and products, a significant increase from 75.3% in 2016. (FSD Kenya, 2019; CBK, KNBS, & FSD Kenya, 2016). The percentage of Kenya's population that uses informal financial services reduced from 32.1 in 2006 to 6.1 in 2019, and the percentage of Kenya's population that is financially excluded reduced from 41.3 in 2006 to 11 in 2019. A Kenya National FinAccess survey conducted in 2019 reveals that mobile money services and digital loan apps took the lead in integrating the previously financially

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<sup>1</sup> Financial inclusion- provision of access to affordable financial services for all individuals.

excluded population. Overall, Kenya's finance sector has been revolutionized by the financial inclusion efforts geared towards improving access and quality of financial products<sup>2</sup> offered within the country.

Savings<sup>3</sup> play a crucial role towards economic growth. At a macro level, gross national savings facilitate growth through investments (Rostow, 1960; Solow, 1956; Ramsey, 1928; Romer, 1986) and cushion the country against international capital inflow shocks. Countries with low savings resort to foreign borrowing or rely on foreign direct investments for growth. Unfortunately, these sources of funds are not effective in spurring growth because of tied conditions and high interest rates that accompany them. Implicitly, meaningful growth can only be facilitated by domestic savings. At a micro-level, savings cushion households against possible economic and climate change shocks as well as unexpected emergencies, increase a household's income through investments, increase access to health and quality education, enable households to smooth their consumption across time, and contribute significantly towards poverty reduction (Kimosop, 2019; Demirguc-Kunt et al, 2018; Prina, 2015; Goldberg, 2014; Branch & Klaehn, 2002).

Despite the importance of savings both at a national and a household level, most developing countries are still unable to effectively mobilize them from households. For instance, 71% of adults in developed countries save as compared to only 43% of adults in developing countries (Demirguc-Kunt et al, 2018). This can be associated with low account ownership in developing countries. Considering that developing countries mostly run on budget deficits which makes their public savings negative, the only way to improve their levels of overall savings is through better mobilization of savings<sup>4</sup> from corporates and households. Unfortunately, such countries have not made any significant progress towards savings mobilization from the households despite their improvements in financial inclusion which was envisioned as a potent tool for increasing savings. Specifically, contrary to the expectations of many policy makers, Kenya's savings as a

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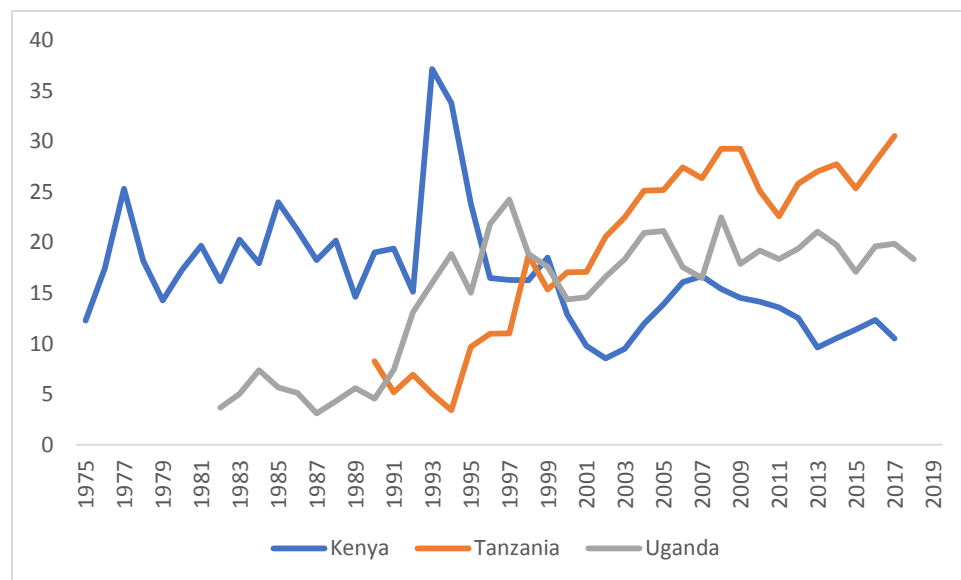
<sup>2</sup> Financial products offered in Kenya's finance sector include savings, credit, payments, and insurance products.

<sup>3</sup> Savings refer to the amount of money and resources set aside for future consumption, some form of inter-temporal trade in consumption.

<sup>4</sup> Savings mobilization: creation of safe financial institutions with well-laid legal framework where individuals can access saving products and deposit with a possibility of getting their initial savings and some return on savings upon withdrawal at a later date (Branch & Klaehn, 2002)

percentage of GDP remains the lowest in the East African Community yet the country leads in financial inclusion.

**Figure 1: Savings as a percentage of GDP for selected East Africa countries.**



**Sources: Own computation from World Bank Indicators, various years**

This trend implies that there is more to just financial access and attention should be directed to the nature and quality of financial products used by Kenyans. Conscious of the fact that mobile money services and digital loan apps took the lead in integrating the previously excluded population into the financial system, the effects of the two on household indebtedness, consumption, and saving patterns cannot be ignored. In view of that, this study focused on access to credit products and its effect on household savings.

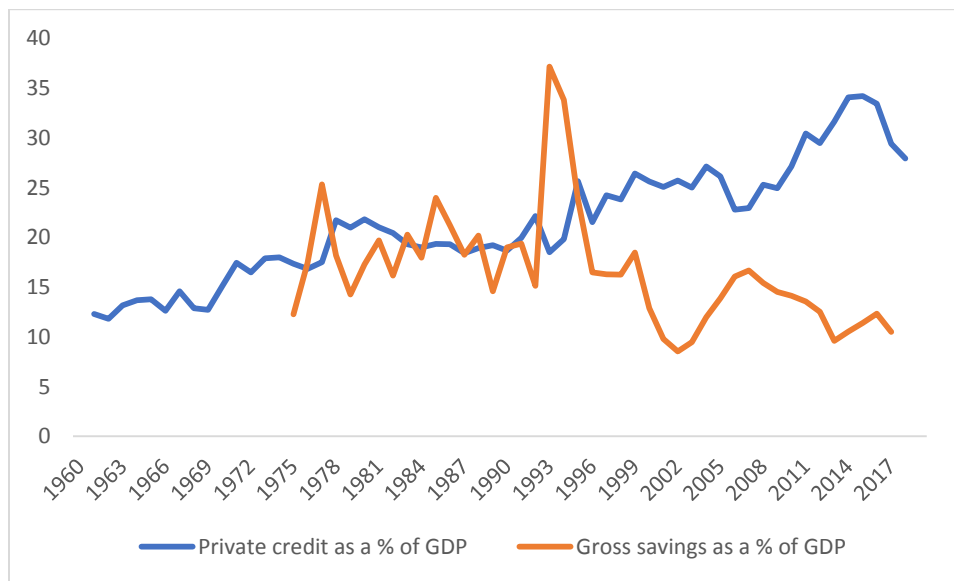
Credit expansion is one of the cornerstones of economic growth in most developing countries as it facilitates investments. Conventionally, credit facilities were available at formal financial institutions like commercial banks and this was limited to a small proportion of the population. Later, campaigns for accessible credit facilities emerged. This was inspired by the fact that most households in developing countries were credit constrained and were incapable of starting meaningful businesses to help in poverty alleviation. Such campaigns led to the emergence of microfinance institutions that were believed to reach the unbankable rural population and financial innovations to reduce the transport costs and time required to reach a financial

institution for loan requisitions (Peter, Irene, & Lauler, 2019). Further, technological advancements led to the emergence of digital credit offered by commercial banks in collaboration with telecommunication providers. In the recent past, Fin-Tech and other non-bank financial institutions have augmented credit access through digital credit. This has revolutionized access and usage of credit facilities in the country.

Overtime, on-demand credit has become available to most individuals through mobile money services like *KCB M-pesa* and *Mshwari*, digital loan apps like *Tala* and *Branch*, and microfinance institutions. In Kenya, the usage of digital loans rose to 8.3% in 2019 up from 0.6% in 2016 (FSD Kenya, 2019). However, most of the digital credit is unsecured and lenders have taken advantage of their superior information to extort borrowers who are financially illiterate through high interest rates (Helmy & Atalla, 2015). In a digital credit survey conducted in Kenya in 2017, 19% of the respondents reported to have been charged loan fees higher than expected, implying a lack of transparency and client manipulation from the lenders (Totolo, 2018).

Debates on the effects of credit on the welfare of households have been on the rise. Most Kenyans take up credit (especially digital credit) to solve short term liquidity emergencies and for consumption purposes (Kaffenberger, Totolo, & Soursourian, 2018) with a few farmers and self-employed individuals using digital credit for business purposes (Totolo, 2018). It is, therefore, plausible that overall credit has limited effect on income increase and hence savings (Peter, Irene, & Lauler, 2019). Due to the high interest rates associated with most loans, it is also plausible that high loan repayments overshadow savings and sometimes households have to withdraw their savings to repay loans. For instance, 49.4% of loan users in Kenya reported to have withdrawn their savings to repay a loan in 2018. Overall, Kenya's private credit to GDP ratio has been rising while her Gross savings to GDP ratio continuously tumbles down.

**Figure 2: Private credit and gross savings as a percentage of GDP for Kenya**



**Source: Own computation from World Bank indicators, various years**

## **1.2 Statement of the problem**

While Kenya's policymakers envisioned that an inclusive financial system will, among other things, boost household savings, this has not been the case. Savings rates have remained relatively low despite the rise in financial inclusion to 89%. This means that the problem is no longer an issue of overall financial inclusion but a matter of the quality and the mix of financial products that individuals choose and how they are used. Unfortunately, most studies have ignored the quality of and the synergy amongst the financial products offered in the country. It is in view of this that this study explored the synergy between savings and credit products in Kenya.

Increased availability of credit can affect the savings behavior of individuals both positively and negatively. First, if credit is used for investment purposes, it can boost profitability of businesses hence higher income levels and savings. A study by Rogg (2000) revealed that increased credit availability encourages formal savings. Access to credit can also increase involuntary savings when institutions offering credit require a minimum amount of savings as a collateral for loan acquisition. On the other hand, access to credit facilities can discourage people's precautionary motives to save since they are most certain to access credit in times of emergencies (Lee & Sawada, 2010; Rogg, 2000; Beverly, (1997); Deaton, 1992). Additionally, individuals having

loans are likely to prioritize the loan repayment rather than saving. In a study in Kenya by Muthia (2011), an extra Kshs. 1000 of monthly loan repayment reduced an individual's monthly savings by Kshs. 1260. The emergence of digital loans has made it worse as the loans are offered at high interest rates to cover up for the information asymmetry on the credit worthiness of the borrowers. This makes loan repayment expensive and could plausibly crowd out savings. Credit used for consumption purposes has little impact on savings. Overall, the source, quality, and the use of credit influences its final effect on savings.

In Kenya, literature on the effects of access to credit on household savings is scanty. Most studies have focused majorly on the effects of access to credit on household incomes, indebtedness, poverty reduction, and resilience to economic shocks. Others have explored demographic and socioeconomic drivers of households on their savings patterns, leaving open the aspect of credit availability and its possible effects on savings. Kibet et al (2009) developed a savings function using a sample of 359 individuals who comprised of teachers, businessmen, and farmers from rural areas of Nakuru district. The study revealed a negative relationship between access to credit and savings. However, the study findings cannot be generalized to be a representation of the national case since the sampled individuals were from one county. According to the literature surveyed, no nationally representative study has been done to assess the effects of access to credit on household savings in Kenya. In view of this, this study examined the effects of credit access on household savings in Kenya using FinAccess 2019 survey data whose sample was nationally representative and captured a broader definition of credit including digital credit.

### **1.3 Objectives of the study**

The main objective of this study was to establish the effects of access to credit on household savings in Kenya. Specifically, this study sought to;

- i. Disaggregate access to credit facilities and usage of savings products in Kenya.
- ii. Investigate the effects of access to credit on household savings in Kenya.
- iii. Explore other determinants of household savings in Kenya.



#### **1.4 Significance of the study**

This study contributed to the existing literature on the determinants of household savings in Kenya. In Kenya, most studies have identified demographic and socio-economic characteristics as the key determinants of micro savings (Kimosop, 2019; Ulwodi & Muriu, 2017; Momanyi & Wainaina, 2016; Peninnah, 2013; Mbuthia, 2011; Wanjiru, 1991). Others have explored the effects of mobile phone usage on household savings in Kenya (Ouma, Odongo, & Were, 2017; Waweru & Kamau, 2017). However, most of these studies have left out credit availability as a factor that could potentially influence savings' decisions of individuals. From the reviewed literature, the study by Kibet et al 2009 is the only one that explored the effect of credit availability on household savings in a Kenyan context. However, this study covered only one county and its results could not, thus, be generalized as a representation of Kenya's context.

From the reviewed literature, therefore, no known nationally representative study has been done on the effects of access to credit on household savings in Kenya. This is despite the expansive access to credit facilitated by financial innovation and its possible harmful effects on households' indebtedness, incomes and ultimately savings. Therefore, this study came at the opportune moment and contributed to the existing literature by revealing the effect of access to credit on household savings in Kenya and thus its results can be relied upon in formulation of related policies. Furthermore, most of the studies on determinants of household savings in Kenya used cross-sectional datasets and therefore, their results cannot be used for prediction purposes beyond the time of data collection. Since this study used Kenya national FinAccess 2019 data which is current, its findings are most reliable for policy formulation.

The study will be of importance to policymakers in two-fold. First, understanding the effects of access to credit on savings will guide on formulation of policies that ensure access to credit does not crowd out savings, such as savings-first approaches to lending. Secondly, it will guide policy formulation by revealing other significant factors that influence savings in Kenya.

#### **1.5 Organization of the study**

The rest of the study is organized in chapters two, three, four, and five in that order. Chapter two, three, and four addresses survey of the literature, methodology used, and research findings and discussions respectively. The last chapter presents the conclusions, policy recommendations, study limitations, and areas for further research.

## CHAPTER TWO

### LITERATURE REVIEW

#### 2.1 Introduction

This chapter presents the relevant literature that relates to saving behaviors of individuals. It is organized into three sections. Section one explores the theoretical literature that relates to consumption, borrowing constraints, and savings. Section two covers the existing empirical studies relating to the study. Section three summarizes the existing literature and identifies the research gap that was addressed by this study.

#### 2.2 Theoretical literature

There exist several theories that explain motives and determinants of savings at a micro level. According to literature, individuals save to smooth consumption across time (Deaton, 1989), for emergency purposes under conditions of income uncertainties or under borrowing constraints (precautionary motive) (Deaton, 1992; Gersovitz, 1988), bequests (Gersovitz, 1988), consumption during retirement, capital accumulation, and down payments. Further, economic literature identifies various determinants of an individual's as well as a household's level of savings.

##### 2.2.1 Income and related savings theories

Generally, economists agree that savings and consumption are dependent on income. The point of divergence is on the dimension of income that affects consumption and hence savings. Some economists argue in favor of absolute income, others in favor of relative income, and others propose that household savings are influenced by its permanent income. These dissimilar opinions have led to evolution of several theories relating savings and consumption to income. These theories are outlined in the following sub-section.

###### 2.2.1.1 Absolute income hypothesis.

This theory is attributed to Keynes (1936) who argued that as an individual's absolute income increases, their current consumption increases although at a rate lower than that of income increase. This hypothesis borrows from psychological law which states that although a man's basic motives are to provide for the needs of themselves and the family rather than accumulate wealth, such needs attain an effective sway when a certain level of satisfaction is attained. This implies that as the absolute income increases, the proportion of income that is consumed

decreases and that which is saved increases (Keynes, 1936). This theory agrees with the diminishing marginal utility of income principle, so that at higher income levels, the proportion of income that goes to consumption reduces while that which goes to savings increases. However, this model does not always hold true considering that rational households make long-term consumption choices.

### **2.2.1.2 Relative income hypothesis**

Developed by Duesenberry (1949), this theory proposes that a person's current consumption depends on the position of the individual's income within the society's income distribution and their consumption in the recent past. This theory was proposed to correct the Keynesian absolute income hypothesis theory which empirically held only for cross sectional data. This implies the ratchet effect<sup>5</sup> of consumption in the short-run where in the event of absolute income reduction, individuals borrow or use up their savings for consumption purposes to keep up with the Joneses and maintain their past consumption standards. Referring to social competitiveness, Duesenberry (1949) argues that individuals measure their satisfaction in a worldly sense and are concerned about their status within the society. This implies that the poor individuals will spend a greater proportion of their income to satisfy their basic needs in the most expensive way possible to ensure that they keep up with the worldly living standards. Overall, this theory implies that an individual's savings depend on their relative rather than absolute incomes.

### **2.2.1.3 Permanent income hypothesis**

Friedman (1957) suggested that a person's consumption depends on their permanent rather than the current disposable income. Friedman (1957) defined permanent income as the amount an individual or a household can consistently consume without causing any reduction in their wealth (Friedman, 1957). This can be interpreted as the interest earned on the financial and human wealth of individuals (Peninnah, 2013). According to this theory, an individual can predict their permanent income for their entire life span and thus smooth consumption across time. Implicitly, any transitory changes in income do not affect an individual's consumption level. Instead, a windfall is invested in a long-term economic activity so as to smooth the benefits

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<sup>5</sup> Ratchet effect of consumption- Failure of household consumption expenditures to reduce when the households' absolute incomes reduce.

across lifetime. Any transitory income is either saved or invested in long-term income generating activities. Thus, this theory associates higher transitory incomes with higher savings.

### **2.2.2 Age and the life cycle hypothesis.**

According to Ando and Modigliani (1963) and Modigliani and Brumberg, (1954) and who are the proponents of this theory, individuals save during their employment age so as to dis-save after retirement to finance their consumption. This means that a person's current consumption depends on their current wealth and their total earnings for the remaining years before retirement. Households set their consumption expenditure to be permanently equal across their lifetime. Mathematically, this can be expressed as:

$$C = \frac{W + RY}{T}$$

Where C is consumption

R= the total number of working years remaining for the individual

Y= Individual's annual income

W= Initial wealth accumulated by the individual

T= total number of years of life remaining.

According to this consumption function, the idea is to equalize individual's marginal utility of expenditure on consumption for all periods.

According to the theory, an individual's savings are related to age in a non-linear manner. Young individuals who have not joined the labour market tend to save very little, if any, since they hardly have a stable source of income and have too many expenses to cater for. As they age, they most likely join the labour market and their income increases while their expenses such as payment for education reduces. At this middle age, individual's savings are highest. Towards their retirement age, individual savings reduce and they start to dis-save after retirement. As per the theory, a nation with a great young and middle-age population is likely to have a higher savings ratio than one with an ageing population. This theory has been criticized by Deaton (1989) who argues that since many households in developing countries are large and consist of different generations living together, social protection and other forms of insurance are offered within the household without needing to save for retirement. Deaton (1989) proposes that most

households in developing countries save for precautionary purposes rather than for consumption purposes after retirement.

### **2.2.3 Uncertainty about future incomes**

In his two period saving model under uncertainty, Besley (1995) demonstrates that uncertainty about future incomes encourages savings amongst households regardless of whether or not they can access credit. In agreement to this, Deaton (1989) argues that households in most developing countries rely on agriculture as their source of income. Since agricultural output is prone to climatic changes, incomes of households that overly rely on agriculture are likely to fluctuate over time. Thus, such households tend to save so as to keep their consumption as smooth as possible even during times of income fluctuations. In corroboration to this, Gersovitz (1988) opines that the level of savings does not only depend on the uncertainty but also on any insurance opportunities available to cushion the household against income shocks. This implies that if individuals have insurance opportunities that can guarantee stability of incomes or help the households mitigate against income fluctuations in the future, then they can buy the insurance instead of factoring in the income uncertainties in their savings choices.

### **2.2.4 Credit constraints**

Deaton (1989) acknowledges that most households in developing countries are credit constrained and cannot access as much credit and at a favourable rate in times of emergencies as they would want to. He, therefore, posits that credit-constrained households save in the current period for possible future emergencies. This is in corroboration with a three-period model for savings behaviour under uncertainty and credit constraints developed by Besley (1995) who demonstrated that potential credit constraints in the future boost the probability to save in the current period. Further, Browning and Lusardi (1996) opine that current and expected liquidity constraints boost current household savings. In submission to this, it can be hypothesized that a strategic removal of borrowing constraints to boost households' liquidity can reduce current household savings.

### **2.2.5 Household size**

While criticizing most of the theories of consumption and savings that had been previously developed, Deaton (1989) argues that their applicability in developing countries is very limited.

He, therefore, proposes a separate study on household savings in developing countries. He posits that most developing countries have different demographic structures, liquidity constraints, and overly rely on agriculture for their income which implies income uncertainties. Further, most developing countries are characterized by large households with people of different generations living together. This ensures provision of insurance and other forms of social protection without any need to save for retirement. Additionally, most households are unlikely to save even for precautionary purposes because of the intergenerational income transfers which crowd out savings. This implies a negative effect of household sizes on savings.

### **2.3 Empirical literature**

In the wake of expansive access to credit in developing countries, the consumption and thus saving patterns of households are expected to change. Different researchers have divergent opinions on how the extensive access to credit affects household savings. Initially, most researchers employed random control trials (RCT) study designs to analyze the effects of microcredit on household finances. For instance, to establish the effect of microcredit in Bosnia, Augsburg et al (2015) carried out a randomized control trial on a sample selected from individuals who had been marginally rejected by a microfinance institution in that region. The study revealed that better access to microcredit discourages both savings and consumption.

Further, some RCT studies posit that access to microcredit reduces wage employment as people achieve sufficient capital to start businesses. This means that the extra income from business profitability is offset by the reduction in wage incomes which implies a neutral effect of access to microcredit on household income (Angelucci, Karlan, & Zinman, 2015; Augsburg et al., 2015; Banerjee, Karlan, & Zinman, 2015; Crépon, Devoto, Duflo, & Pariente, 2014). Going by consumption and savings theories that propose an increase in savings for increase in income, this implies that access to microcredit does not significantly influence savings. Although informative, the replicability of the results of most RCT studies is limited. This is because the studies focus on a particular microcredit program implemented on a specified target population whose characteristics are not representative of the general population. Such studies are also prone to sample bias.

When households have access to formal credit, they tend to build trust in the formal institutions during their continuous interactions in loan repayment. This motivates them to transfer their informal savings to deposit accounts in the formal financial institutions. Ultimately, there's a boost of the overall savings in the formal financial intermediaries which positively influences investments. These were the findings of Rogg (2000) who used a probit regression technique to model the savings' decisions of micro-entrepreneurs in Paraguay, Salvador, and Ecuador. The independent variables used were number of children in the household, age, age squared, income, marital status of the entrepreneur, type of the business, access to credit from commercial banks, ownership of business premises, value of the business, the level of education of the entrepreneur, other incomes, and gender of the micro-entrepreneur. The study revealed that credit availability increases savings' frequency. The study further revealed that although access to credit reduces the overall savings, it boosts formal savings (Rogg, 2000).

Access to credit is likely to boost savings partly because most lenders require a minimum amount of savings as a collateral for loan acquisition. It could also boost income if credit is invested in income generating activities thus boosting savings. This hypothesis was proved true by Kiiza and Pederson (2002) who carried out a panel data analysis to establish the factors that influence savings behaviour of households in Uganda. The study used primary data collected from 370 households living in Eastern, Western, and Central parts of Uganda. Using the Weighted Least Squares estimation technique, the study modelled a household's savings as a function of income, credit availability, interest rate, and access as well as quality of financial services. The study revealed that credit availability encourages savings. Further, the study revealed that higher income levels and better access to quality financial services encourages savings. However, this study left out other demographic and socioeconomic characteristics of households which are crucial in modelling household savings hence the results could be misleading.

Credit availability influences the saving patterns of the poor differently from those of the rich. For poor households with limited access to formal financial institutions, credit availability boosts informal and not formal savings since such households can only access informal credit. This can be attributed to low or no incentive for poor households to transfer their informal savings to

formal deposits. These were the findings of Helmy and Atalla (2015) who used the 2012 Egypt Labour Market Survey data to determine the savings behaviour of poor Egyptians. Employing a probit regression model, the study revealed that credit availability encourages savings among the poor. On the form of savings used, access to credit boosts informal savings while its effect is insignificant on formal savings of the households. This implies that policy makers need to encourage formal borrowing among the poor should they want to boost overall savings in the formal financial channels. This can be done through encouraging formal institutions to come up with pro-poor products like low interest loans.

Further, the study revealed that being educated, married, female, and employed increases an individual's probability to save both formally and informally. The study reveals a quadratic relationship between age and individual's probability to save, corroborating with the life-cycle hypothesis. Individuals who were uncertain about their future incomes were more likely to save than those who were certain. This was in support of Deaton (1989) and Gersovitz (1988) who posit that uncertainties about future incomes increase current level of savings. Rural households save less compared to urban households. Similarly, the study revealed that large household sizes negatively affect savings. Expectations of special household events increased individual savings.

In a related study, Muthia (2011) emphasizes on the importance of formal borrowing towards formal savings mobilization. In her study to explore the factors influencing people's decisions to save in a particular financial institution in Kenya, Muthia (2011) revealed that having access to credit in a financial institution increased the household's probability to save in that particular financial institution. Implicitly, a reduction of borrowing constraints and an improvement of access to financial services in formal financial institutions would boost formal savings. However, the study revealed a negative relationship between bank density and financial savings. This could be explained by the fact that bank concentration encourages consumption as people can easily access banks and withdraw their money for consumption purposes. Further, Muthia (2011) revealed that having higher income levels and relying on formal financial institutions as the main financial service provider encouraged savings. On the other hand, expenditures on loan repayment and education were observed to significantly reduce the amount of savings. Contrary to many other studies (Ulwodi & Muriu, 2017; Kibet et al, 2009; Kiiza & Pederson, 2002), this study revealed a negative relationship between education and savings.



In developing the saving function, this study overlooked access to credit as a determinant of savings. Instead, it focused on the dimension of credit usage proxied by the amount of monthly loan repayment, an aspect which does not fully address credit effect on precautionary savings motives. Loan usage does not outrightly discourage precautionary saving motives. However, a guaranteed access to credit can discourage savings for investment and precautionary purposes. Thus, while this study focused on the usage dimension, my study focused on the dimension of access. Additionally, Mbuthia (2011) used Kenya National FinAccess 2006 and 2009 surveys and the findings cannot be used for prediction beyond the time of data collection. The definition of credit and patterns of credit access and usage have broadened overtime. This further justified my study which used the most recent Kenya National FinAccess 2019 data.

Additionally, the need to maintain one's social status and guard their reputation could make users of credit to put aside some money for loan repayment to spare themselves the shame associated with loan defaulting. This was the opinion of Aktaruzzaman and Farooq (2017) who employed the regression discontinuity design approach to establish how microcredit affected savings of individuals belonging to households sampled from 69 villages in Bangladesh. The study revealed that having access to microcredit increased the chances of a household to save in Bangladesh. The researcher attributes this phenomenon to the fact that people using microcredit have to put aside some money for monthly repayment of the credit to spare themselves the shame associated with defaulting a loan. The study also revealed that household characteristics were jointly significant determinants of household savings.

Another set of researchers allude to a negative effect of access to credit on household savings. This is attributable to the fact that access to credit demotivates households to save for precautionary or speculative purposes as they are guaranteed of access to credit in cases of an emergency. Further, most households prioritize loan repayment over savings. Using ARDL model and time series data for 1960 to 2004, Jongwanich (2010) revealed a negative relationship between access to bank credit and household savings rate in Thailand. Other findings were a positive effect of real per capita growth rate, inflation, and terms of trade on household savings rate and a negative effect of public and corporate savings on household savings rate. The study

also confirmed the life cycle hypothesis in Thailand. Although informative, this study focused on savings in the macro context and the replicability of these results in a micro setting is limited.

Similarly, a probit regression analysis by Kibet et al (2009) revealed that credit availability discouraged savings among households in Nakuru county, Kenya. The author attributed this relationship to the fact that most poor households use credit for consumption rather than for investment purposes(Kibet et al, 2009). The study, thus, recommends that access to credit should be accompanied with policies that define its usage. Further, the study revealed that households whose heads were businessmen, male, educated, and had high income levels saved more than those households whose heads were females, less educated, had lower income levels and were engaged in farming or teaching as an occupation. The study also revealed that dependency ratio and age had negative effects on household savings. However, this study used a sample size of 359 households and its scope was limited to one county. Therefore, its findings cannot be assumed to be a representation of the entire country. Additionally, the study used cross-sectional data hence the findings cannot be used for prediction purposes beyond the time of data collection.

Access to credit is likely to discourage savings for precautionary purposes and the marginal effect is larger for the wealthy individuals. This was the motivation of a study by Lee and Sawada (2010)which sought to establish the effects of liquidity constraints on the saving patterns of households in rural Pakistan. Employing Kimball's prudence<sup>6</sup> parameter (Kimball, 1990), the study revealed that being liquidity constrained was associated with higher precautionary savings in Pakistan. This implies that a removal of borrowing constraints would decrease precautionary savings, implying a negative effect of credit availability on precautionary savings. Further, the study revealed that wealthier households have a lower propensity to save for precautionary purposes as compared to poor households. This is attributable to the fact that wealthier households have better access to credit facilities in cases of emergency as compared to poor households.

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<sup>6</sup> Prudence parameter is used to indicate the strength of the motives of a household to save for precautionary purposes. (Kimball, 1990).

To determine the effects of credit market access on the profitability of agriculture in Tunisia, Foltz (2004) used a switching regression model and a cross-sectional dataset collected from randomly selected households that practiced irrigation farming in North-Eastern Tunisia. The study revealed that credit constraints significantly impinge the profits of farmers. This could be attributed to the fact that credit constraints limit the extend of farm mechanization hence low profitability. Going by savings theories that associate higher incomes with higher household savings, this study implicitly shows a negative effect of credit constraints on household savings.

It would be quite dismissive of economic researchers not to address the socioeconomic and demographic determinants of household savings. Ulwodi and Muriu (2017) proposed that household savings can be modelled as a function of age, gender, marital status, education, and the income level. The study employed a seemingly unrelated regression model (SURE) and the FinAccess 2016 and Finscope 2013 surveys for Kenya and Tanzania respectively. The study revealed that as people age, they prefer using formal other savings platforms instead of formal and informal savings platforms.

The study also revealed that as people age, they prefer saving in formal and formal other platforms that are considered less risky than the informal. Education was found to positively influences access to formal and formal other financial savings. Marital status positively influences access to formal other saving platforms and negatively influences access to informal and exclusion strands. However, marital status does not significantly influence access to formal savings. Higher income levels were associated with more chances of accessing formal and formal other saving strands and lower chances of being excluded. The study revealed that overall, women are more likely to be excluded and use informal savings than men. The study results also hinted that urban areas present better access to savings unlike the rural areas. Although informative, the study overlooked the effect of credit access on household savings.

In a related study, Nwosu, Anumudu, and Nnamchi (2019) carried out a cross-sectional data analysis using the Harmonized Nigeria Living Standards survey data collected in 2008 and 2009 to model a household savings function. The study modelled household savings as a function of land ownership, gender, marital status, age, education, and sector of employment of the

household head, household size, total household expenditure, access to electricity, and the household's living conditions. Employing two stage least squares estimation technique, the study revealed that households that were female-headed, owned land, were engaged in agriculture, those which had good living conditions, and those whose heads had never married and had an educational attainment above secondary level saved more than their counterparts. Further, the study revealed a quadratic relationship between age and household savings with a turning point at 79 years. This was in corroboration with the life cycle hypothesis. The study revealed a negative effect of household size, total household expenditure, and access to electricity on net household savings.

Kimosop (2019) explored the determinants of savings among the rural poor households of Uasin Gishu County who were engaged in table banking. Using ordinary least squares estimation technique, the study revealed that households that had higher income levels saved more than those that had lower income levels. Additionally, the study results hinted that bigger households are less likely to save compared to the smaller ones. This study, however, did not include other key variables like age, marital status, and gender of the household heads. Additionally, the study focused on households in one county and its results cannot be said to be nationally representative.

### **2.3 Overview of the literature**

The absolute, relative, and permanent income hypotheses all agree that income determines the level of savings, only that they do not agree on the dimension of income that influences savings. The life-cycle hypothesis proposes quadratic relationship between age and savings. Other determinants of savings are credit constraints, uncertainties about future incomes, and household sizes in addition to socio-economic and demographic factors.

Economic theory proposes income and age as the key determinants of household savings. However, the applicability of such theories in developing countries is limited as the demographic, financial, and institutional structures of developing countries are different from those of developed countries. For that reason, economic theory has evolved to capture such issues. Regarding access to credit, saving models under borrowing constraints predict high savings among households that are credit-constrained.

Empirical studies reveal that the level of income, age, gender, education, and marital status of the household head, location and size of the household, land per capita, income uncertainties, and access to financial institutions are key determinants of household savings (Kimosop, 2019; Nwosu, Anumudu & Nnamchi, 2019; Aktaruzzaman & Farooq, 2017; Ulwodi & Muriu, 2017; Helmy & Atalla, 2015; Mbuthia, 2011; Jongnawich, 2010; Kibet et al, 2009; and Kiiza & Pederson, 2002). However, most of these studies have left open the question of how access to credit affects household savings yet this is a significant research area considering the burgeoning policies for credit expansion in developing countries.

A survey of the existing literature revealed that studies done on the effect of access to credit on household savings give contradicting results. While Aktaruzzaman and Farooq (2017), Helmy and Atalla (2015), Kiiza and Pederson (2002), and Rogg (2000) reveal a positive relationship between the two variables, Jongnawich (2010), Lee and Sawada (2010) and Kibet et al (2009) reveal a negative relationship. According to the literature reviewed, the study by Kibet et al, (2009) is the only one that examined the effect of credit access on household savings in a Kenyan context. However, the scope of this study was limited to one county and its results cannot, thus, be generalized as a representation of Kenya's context. Furthermore, the study used a cross-sectional dataset collected in 2009 and therefore, its results cannot be used for prediction purposes beyond the time of data collection. In view of this, this study aimed to fill this literature gap by empirically testing the effects of access to credit on household savings in Kenya using the FinAccess 2019 survey data which is most current and whose sample was nationally representative.

## CHAPTER THREE

### METHODOLOGY

#### 3.1 Introduction

This chapter covers the theoretical underpinning of the study, the methodological approaches employed, and the data sources.

#### 3.2 Theoretical framework

This study adopted a savings model under borrowing constraints developed by Deaton (1991) and later used by Rogg (2000). The model employs the utility maximization theory where the consumer's problem is to maximize their intertemporal consumption. This model borrows from the permanent income and life cycle hypotheses which posit that individuals save so as to equalize their marginal utility of consumption across time.

Here, consumers maximize their utility which is a function of current consumption. That is,

$$\text{Max. } U = f(C_t) \dots \dots \dots 1$$

Assuming that  $U$  is constant across time<sup>7</sup>, then the consumer's problem is to maximize:

$$V = E_t \sum U(C_t) \dots \dots \dots 2$$

subject to the budget constraint that lifetime consumption cannot be greater than lifetime income. That is;

$$\sum_{t=0}^{T-1} \frac{C_t}{(1+r)^t} \leq \sum_{t=0}^{T-1} \frac{Y_t}{(1+r)^t} \dots \dots \dots 3$$

This model assumes a constant interest rate equal for both loans and savings.

A maximization of equation (2) subject to equation (3) yields an individual's optimal intertemporal consumption choices represented in a form of a Euler equation as shown in equation (4)

$$U'(C_t) = \left[ \frac{1+r}{1+\delta} \right] E_t U_t(C_{t+1}) \dots \dots \dots 4$$

This expression shows that an individual's optimal intertemporal consumption choices depend on the rate of interest ( $r$ ), expectations about the future ( $E_t$ ), and the rate of time preference ( $\delta$ ).

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<sup>7</sup> This assumption is untenable in the long-run because utility changes over time with continuous changes in household structures as well as the needs of people. (Deaton, 1995)

To introduce the borrowing constraint faced by households and individuals in most developing countries, we assume that the interest rate is infinite so that households cannot borrow completely.

This implies a further constraint expressed as:

$$C_t \leq A_t + Y_t \dots \dots \dots 5$$

where  $C_t$  is the current consumption,  $A_t$  is the sum of all assets accumulated in the previous periods, and  $Y_t$  is current income.

Saving in the current period enables the consumer to transfer assets in the next period to augment their consumption in the next period. Assets transferred in the next period are thus given by:

$$A_{t+1} = (1 + r) [A_t + Y_t - C_t] \dots \dots \dots 6$$

The assumption of infinite interest rate implies that the consumer cannot borrow hence assets from the previous period must be non-negative. That is,

$$A_t \geq 0 \dots \dots \dots 7$$

Introduction of constraint 5 and 7 in the Euler equation of optimal intertemporal consumption yields:

$$U'(C_t) = \max U' [A_t + Y_t, \frac{1 + r}{1 + \delta}] E_t U_t(C_{t+1}) \dots \dots \dots 8$$

This implies that on top of interest rate, expectations about the future based on the information currently available, and the per-period sub-utility discounting rate, the intertemporal consumption choices of the individual also depend on the ‘cash-on-hand’ given by  $A_t + Y_t$ .

The borrowing constraint holds only when  $r < \delta$ . If  $r > \delta$ , individuals would still save and the above constraint would not bind because for such individuals, future benefits of return on their savings are more enticing than the current consumption benefits. Implicitly, the borrowing constraint is applicable only when  $r < \delta$ , a common feature of impatient consumers. This implies that individuals would dissave to smooth their consumption until their  $A_t = 0$  then rely on subsequent periodical incomes for consumption in the following periods. This means that in case of any income shocks, consumers will be unable to meet their consumption needs in the future as they cannot borrow.

This study explored households’ saving patterns when borrowing barriers are removed (credit made accessible to households). The above model predicts that removing borrowing constraints

negatively affect savings through several channels. First, removal of borrowing constraints could make impatient consumers borrow so as to increase their consumption in the current period. If they had not accumulated any assets in the previous periods, borrowing converts them from non-savers to negative savers. For risk-neutral people who used to save before, removal of borrowing constraints would discourage them from cutting current consumption to save as they become aware that they can always access credit in case of any emergencies or income shocks. For the risk-averse individuals, their saving motives are likely to remain unaffected by removal of borrowing constraints. According to the model, access to credit lowers the level of savings on average.

### 3.3 Empirical model

The theoretical model reveals that intertemporal consumption substitution is influenced by borrowing constraints, expectations about the future, accumulated assets, income level, and interest rates. Although this study explored the effect of access to credit (removal of borrowing constraints) on household savings, the empirical model controlled for other socioeconomic and demographic characteristics to account for household differences. According to the reviewed literature, the key socioeconomic and demographic determinants of household savings are gender, age, the level of income, household size, highest educational attainment and marital status of the household head, and location.

Therefore, this study modelled savings' decisions as a function of access to credit, income, gender, age, marital status, and the highest educational attainment of the household head, household size, and location of the household.

That is:

*Savings*

= *f(credit access, income, gender, Age, Age squared, marital status, education, household size, and location).*

Assuming causality and linearity of parameters, the estimation model was specified as follows;

$$S = \beta_0 + \beta_1 C.A + \beta_2 I.G + \beta_3 GHH + \beta_4 A + \beta_5 A^2 + \beta_6 MS + \beta_7 EHH + \beta_8 HS + \beta_9 HHloc + \mu \dots \dots \dots 9$$

Where



S is the probability of a household to save, C.A is access to credit, I.G the income group to which the household's monthly income falls, GHH, A, A<sup>2</sup>, MS, EHH are the gender, age, square of the age, marital status, and the education the household head respectively, HS is the household size, HHloc is the household location, and  $\mu$  is the error term.

### 3.4 Definition and measurement of variables

In this study, the response variable was usage of savings products whether formal, semi-formal, or informal. It was indicated by 1 if the household had a savings product and 0 otherwise.

In defining credit constrained individuals, this study strictly followed Jappelli et al., (1998) who define credit constrained individuals as those who have requested for a loan from a financial institution or a group and been denied.

Other independent variables are explained in table 1 below.

**Table1: Definition and measurement of variables**

Variable	Notation	Measurement	Predicted effect	Data source
Credit access	C.A	Household's access to credit, indicated by 1 if the observation is made and 0 if otherwise.	Negative	FinAccess 2019 survey
Household's income group	I.G	Income category to which a household's income falls. It was captured in 5 categories of income groups where: Group 1 income range was Kshs. 0-3,000, group 2 is Kshs. 3,001-15,000, group 3 was Kshs. 15,001-70,000, group 4 was Kshs. 70,001- 400,000, and group 5 was Kshs. 400,001 and above.	Positive	FinAccess 2019 survey
Gender	GHH	Gender of the household head. It was indicated by 1 for male and 0 for female.	Positive/Negative	FinAccess 2019 survey
Household size	HS	Number of persons in the household.	Negative	FinAccess 2019 survey
Age	A	The age of the household head in years.	Positive	FinAccess 2019 survey
Age squared	A <sup>2</sup>	The square of the age of the household head.	Negative	FinAccess 2019 survey
Education	EHH	The highest educational attainment of the household head. It was captured as a dummy variable where 1 indicated none or no education, 2 indicated primary education, 3 for secondary, 4 for tertiary, and 5 for other	Positive/ Negative	FinAccess 2019 survey
Marital status	MS	Marital status of the household head. It was captured as a dummy where 1 indicated the single/ never married, 2 for divorced/separated, 3 for the widowed, 4 for the married/ living with the partner, and 5 for other.		FinAccess 2019 survey

Household location	HHloc	The type of a cluster in which the household is located. It was captured as dummy where 1 indicates urban and 0 indicates rural.	Positive	FinAccess 2019 survey
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### 3.5 Econometric approach

This study focused on whether the household was using a savings product or not during the time of data collection. That gave the savings variable a binary nature expressed as:

$$Y = \begin{cases} 1 & \text{if a household was using a savings product at the time of data collection} \\ 0 & \text{otherwise} \end{cases} \dots 10$$

Due to the qualitative and binary nature of the response variable, the study employed a probit regression model. This model guarantees that the predicted probabilities are positive but less than 1 unlike the linear probability model (Damodar, 1972). A probit regression model was preferred to a logistic regression model because the former assumes that the dataset is normally distributed, although the two models give similar results.

In a probit model, the probability that a household saves given a number of independent variables can be expressed as:

$$P = E(Y = 1|X) = \Phi(X\beta) \dots \dots \dots 11$$

where  $\Phi(\cdot)$  is the standard normal distribution.

Further, consider an unobserved variable  $Y^*_i = X'_i\beta + \mu \dots \dots \dots 12$

which models the net benefit of saving as compared to not saving. In this case,  $\mu \sim N(0,1)$ , X is a vector of the independent variables, and  $\beta$  a vector of the parameters to be estimated.

We observe the binary variable that indicates the sign of  $Y^*_i$  instead of observing the  $Y^*_i$  itself.

This rewrites equation (10) as

$$Y_i = \begin{cases} 1 & \text{if } Y^*_i > 0 \\ 0 & \text{if } Y^*_i \leq 0 \end{cases} \dots \dots \dots 13$$

Given  $X^*_i$  the distribution of  $Y_i$  can be derived as:

$$P(Y_i = 1|X_i) = P(Y^*_i > 0|X_i) \dots \dots \dots 14$$

$$= P(X_i\beta + \mu_i > 0|X_i) \dots \dots \dots 15$$

$$= P(\mu_i > -X_i\beta|X_i) = 1 - \Phi(-X_i\beta)$$

$$= \Phi(X_i\beta) \dots \dots \dots 16$$

Therefore,  $P(Y_i = 0|X_i) = 1 - \Phi(X_i\beta) \dots \dots \dots 17$

Combining equations (16) and (17) gives

$$F(Y|X_i) = \{\Phi(X_i\beta)\}^y\{1 - \Phi(X_i\beta)\}^{1-y} \dots\dots\dots 18$$

The log likelihood for the  $i^{th}$  observation is given as:

$$L_i(\beta) = Y_i \log \Phi(X_i\beta) + (1 - Y_i)\log(1 - \Phi(X_i\beta)) \dots\dots\dots 19$$

To obtain the estimated parameters ( $\hat{\beta}$ ) that maximize the log likelihood for the  $i^{th}$  observation, equation 19 is estimated using maximum likelihood estimation technique (Wooldridge, 2010). The estimated econometric model thus becomes:

$$P_i = P_r(Y_i = 1|X_i) = \Phi(\beta_0 + \beta_1 X_i) \dots\dots\dots 20$$

Where  $\Phi(\cdot)$  is the standards normal distribution,  $P_i$  is the probability that the household uses a savings product,  $X_i$  is a vector of independent variables for each household, and  $Y_i$  represents the household savings. The marginal effects of each independent variable on the probability of savings are further generated.

### 3.6 Sources of data

This study used the 2019 Kenya national FinAccess survey data which was household-based and conducted from October to December, 2018. The survey employed a two-stage stratified cluster sampling to ensure representativeness of the sample at national and regional levels, rural and urban areas. First, 1000 clusters were selected (566 in rural areas and 434 in urban areas) from the NASSEP V sampling frame. Afterwards, 11 households were selected from a set of households in each cluster using systematic random sampling technique. This made a total of 11,000 households sampled for the survey. At the household level, a kish grid was used to select a respondent out of all the household members who were potential respondents (16 years and above). Although 11,000 households had been selected, only 9,709 were eligible for interviewing as the others were unoccupied during the time of the interview. Out of the 9,709 eligible households, 8,669 were ultimately interviewed giving a response rate of 89.3%. Out of the 8,669 respondents interviewed, 42.25% were males and 57.75% females. In terms of location, 58.35% and 41.65% of these respondents came from households living in rural and urban areas respectively. Since this study focused on determinants of savings at a household level, the probit regression was done on the household cases where the respondent was the household head, a step motivated by the need to factor in the demographic characteristics of the household head. This

gives a final sample of 4,964 households whose data was regressed. Other data cleaning and transformations were done to meet the objectives of the study.

### **3.7 Pre-estimation tests**

#### *Multicollinearity*

This is the existence of a linear relationship between the independent variables. In the presence of perfect multicollinearity, regression coefficients are indeterminate and possess infinite standard errors. In the presence of imperfect multicollinearity, although the regression coefficients can be determined, their standard errors are relatively large and thus the coefficients cannot be estimated accurately (Greene, 2000). Under multicollinearity, the OLS estimators tend to have large variances which implies high confidence intervals and t ratios which can lead to wrong inferencing (Damodar, 1972). I employed a pairwise correlation matrix to test for multicollinearity.

## CHAPTER FOUR

### EMPIRICAL FINDINGS

#### 4.1 Introduction

This chapter presents empirical findings of the study. These include descriptive statistics, correlation analysis and multivariate regressions.

Since this study focused on determinants of savings at a household level, the probit regression was done on the household cases where the respondent was the household head, a step motivated by the need to factor in the demographic characteristics of the household head. Other data cleaning and transformations were done to meet the objectives of the study.

#### 4.2 Summary statistics

Table 2 presents summary statistics. The respondents' ages range from 16 to 95 years. The average age of the respondents was 39 years, implying that most respondents were in their economically productive age. As per the life cycle hypothesis, this implies that the households are expected to exhibit the best saving patterns. Additionally, the mean household size was 3.974 which is an approximate of four individuals per household. In the context of developing countries, this number is small enough and that further implies that households in Kenya should be exhibiting good saving patterns. Further disaggregation of the data reveals that 67.24% of Kenyans do save.

**Table 2: Summary Statistics**

Variable	Obs.	Mean	Std.Dev.	Median	Min	Max
Savings overall	8669	.672	.469	1	0	1
Credit access	8669	.949	.221	1	0	1
Location	8669	.417	.493	0	0	1
Age	8669	39.294	17.104	35	16	95
Income group	8669	1.915	.99	2	1	6
Household size	8669	3.974	2.322	4	1	21
Gender	8669	.423	.494	0	0	1
Education	8669	2.393	.889	2	1	5
Marital status	8669	3.024	1.285	4	1	5

Table 3 shows an insignificant gender gap in saving patterns with 66.61% of males and 67.70% of females in Kenya reporting to have been saving. Turning to the level of education, table 4 shows a positive effect of education on savings with 83.86% of all respondents who had attained tertiary education saving compared to 50.42% of those who had not attained any education.

Table 1 on the appendix shows that 86.76% of individuals with access to formal financial services save while only 21.94% of the excluded reported to be saving. This implies that usage of saving products is common among those with access to formal financial services.

**Table 3: Uptake of saving products by gender**

Savings overall	Selected Respondent Gender		
	Male	Female	Total
Does not save	43.06	56.94	100.00
	33.39	32.30	32.76
Saves	41.86	58.14	100.00
	66.61	67.70	67.24
Total	42.25	57.75	100.00
	100.00	100.00	100.00

First row has *row percentages* and second row has *column percentages*

**Table 4 Savings by education level**

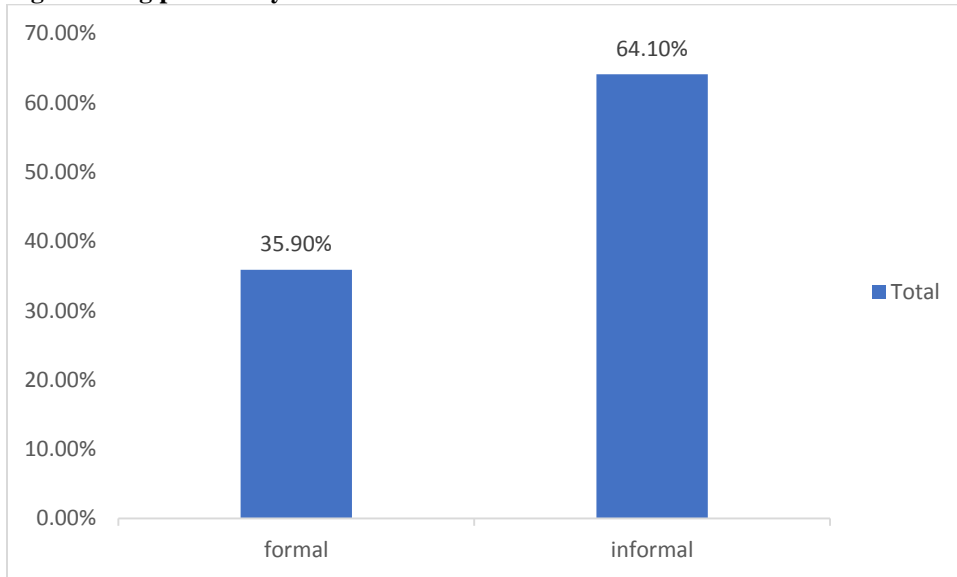
Savings overall	Education level of Respondent					Total
	None	Primary	Sec	Tertiary	Other	
Does not save	22.78	43.27	27.89	5.92	0.14	100.00
	49.58	32.98	30.67	16.14	26.67	32.76
Saves	11.29	42.84	30.71	14.98	0.19	100.00
	50.42	67.02	69.33	83.86	73.33	67.24
Total	15.05	42.98	29.78	12.01	0.17	100.00
	100.00	100.00	100.00	100.00	100.00	100.00

First row has *row percentages* and second row has *column percentages*

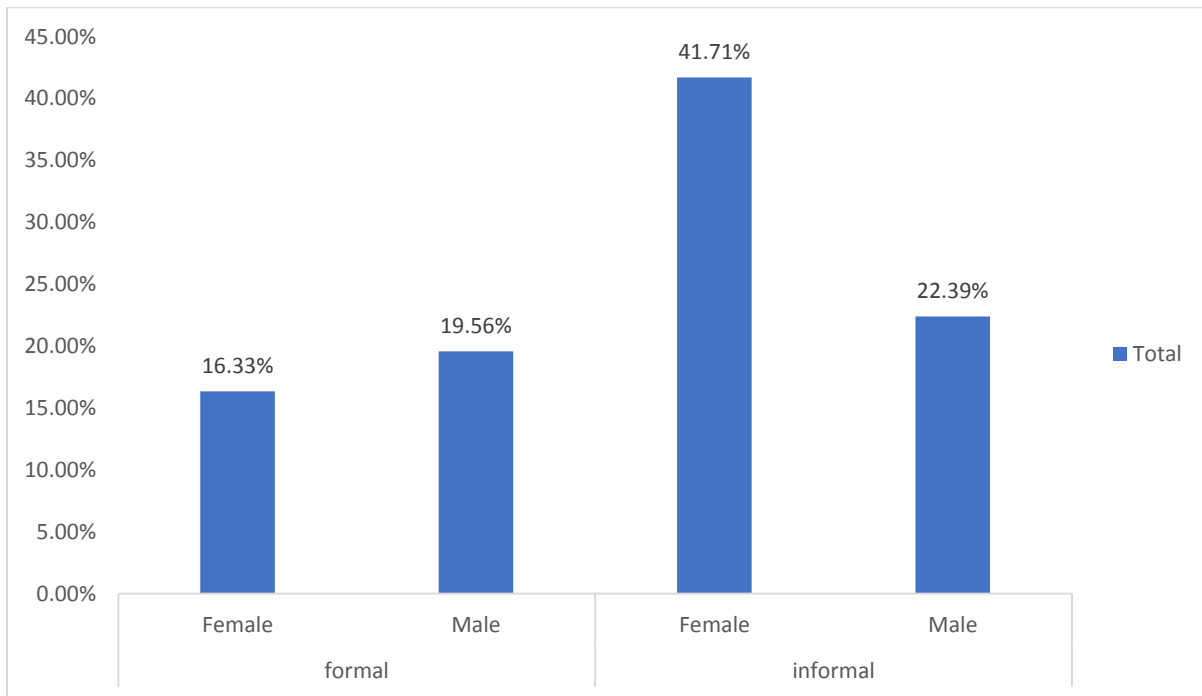
On the choice of the institutions to save, the study revealed that most households prefer informal savings platforms. Figure 3 shows that 64.1% of savers exclusively use informal saving platforms. In terms of gender, figure 4 points to more usage of informal saving platforms by females as compared to males. Out of the 64.1% of savers using informal saving platforms, 41.71% were females while males were only 22.39%.

Fig. 5 demonstrates that savings in a secret hiding place and a group/chama were the most preferred by 34.48% and 22.79% of the savers respectively. Moreover, the conventional formal saving platforms have been overtaken by newly established mobile money saving platforms. Although 8.23% of savers save in bank deposit accounts, 19.19% of the savers use mobile money saving platforms. Figure 6 shows that most informal savers are located in the rural areas. In terms of wealth, most users of informal saving platforms are in the lowest wealth quintile suggesting an inaccessibility of formal saving platforms for the poor. This is demonstrated by table 2 in the appendix where 76.7% of savers in the lowest wealth quintile use informal saving platforms.

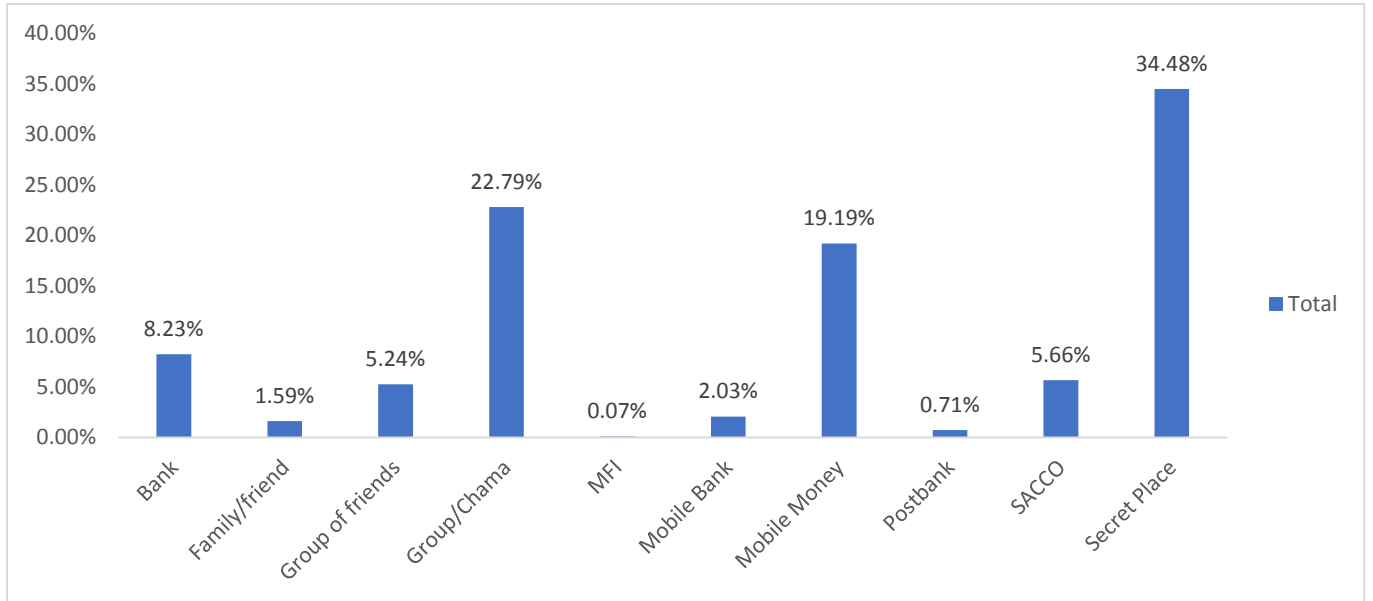
**Fig 3: saving product by form**



**Fig. 4: Saving products by form and gender**



**Fig. 5: Uptake of saving products by institution**



**Fig. 6: Saving products by location**

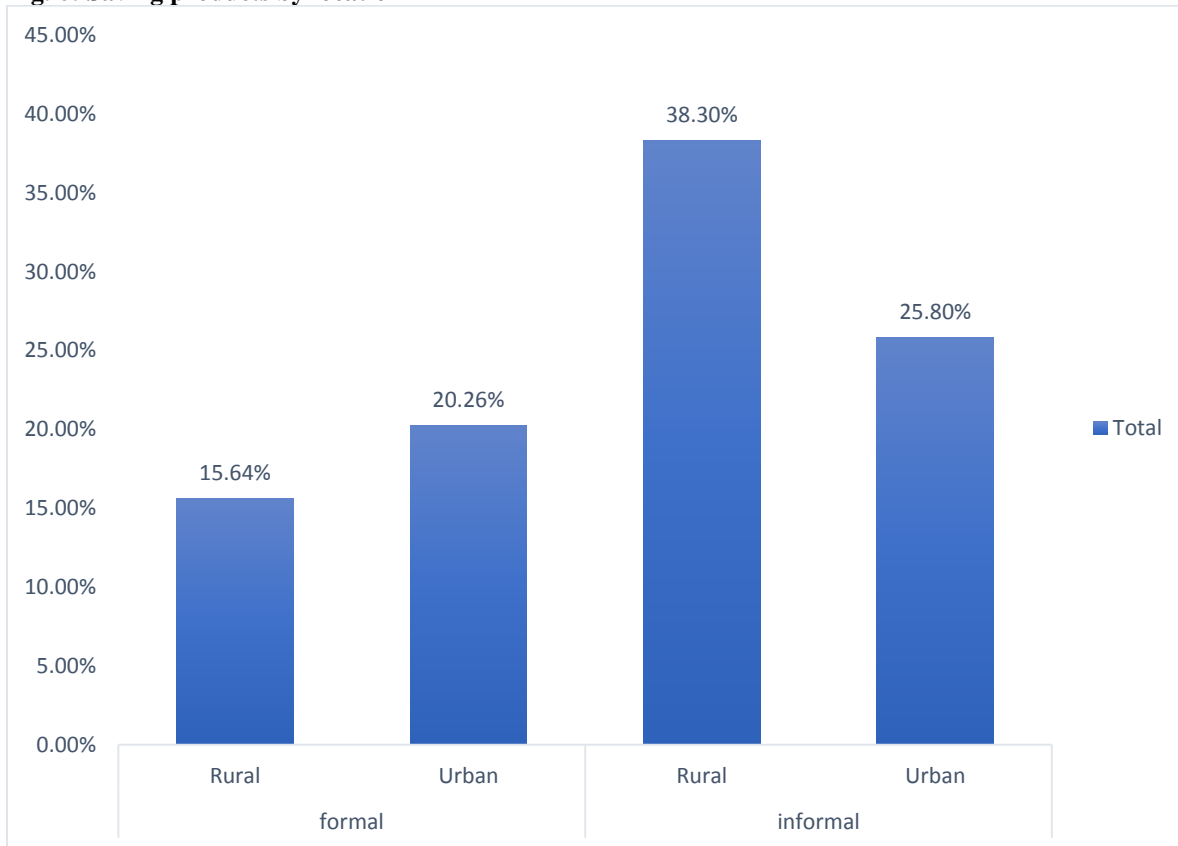




Table 5 shows access to credit by gender where 94.86% of Kenyans had access to credit during the time of the survey. The survey revealed an insignificant gender gap with 94.54% of males and 95.09% of females having access to credit. Contrary to theoretical expectations, table 2 in the appendix reveals that credit is more accessible to people with no education than to those with some level of education. This could be explained by the prevalent usage of informal credit which does not have many pre-requisites. The majority of those with access to credit were those with access to formal non-prudential financial services (See Table 3 in the appendix).

**Table 5 Credit access by gender**

Credit access	Selected Respondent Gender		
	Male	Female	Total
Cannot access credit	44.84	55.16	100.00
	5.46	4.91	5.14
Can access credit	42.11	57.89	100.00
	94.54	95.09	94.86
Total	42.25	57.75	100.00
	100.0	100.00	100.00
	0		

First row has *row percentages* and second row has *column percentages*

Table 6 shows the reasons for the denial of credit. Having a bad or no credit history, too low-income levels to repay loans, and low levels of savings were cited as the most common reasons for credit denial

**Table 6: Reasons for credit denial**

Reason for credit denial	percentage
Bad/no credit history	19.89%
Blacklisted on CRB/ defaulted	1.38%
Did not have all requirements	0.83%
Don't know	2.76%
Inactive line/account not ready	1.93%
Income is low and unable to repay	6.35%
Lack of business proposal	1.10%
Lack of collateral	6.35%
Lack of records	5.80%
Long process	1.38%
No guarantor	2.49%
No pay slip	1.38%
Not enough money to lend	0.55%
Project is too risky	0.83%

Savings too low	19.06%
Still had debts to repay	14.64%
Was not given a reason	13.26%
<b>Grand Total</b>	<b>100.00%</b>

### 4.3 Correlation analysis

This study employed the pairwise correlation matrix to establish the nature and the strength of correlation between the independent variables hence testing for the presence of multicollinearity. Multicollinearity affects the precision of the regression coefficients hence making the generated p-values unreliable for testing the statistical significance of each variable. As a rule of thumb as stated by Damodar (1972), a dataset has a serious multicollinearity problem if the pairwise correlations between some sets of independent variables is greater than |0.8|. From table 6 below, all the pairwise correlations fell way below the above threshold implying that multicollinearity was not a problem.

Table 7: Pairwise correlation matrix

	Credit access	Location	Gender	Age	Income group	Education	Marital status	Household size
Credit access	1							
Location	-0.0543***	1						
Gender	-0.0122	0.0205	1					
Age	0.0227*	-0.162***	0.0251*	1				
Income group	-0.0168	0.199***	0.114***	0.0207	1			
Education	-0.0804***	0.284***	0.136***	-0.318***	0.212***	1		
Marital status	0.000243	-0.105***	-0.0382***	0.332***	0.0840***	-0.190***	1	
Household size	0.0413***	-0.198***	-0.0267*	-0.151***	-0.0994***	-0.141***	0.147***	1

Note: \* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$  indicate the level of significance.

### 4.4: Estimation results

To achieve the study objectives, a probit regression model was estimated. Although both logit and probit models give close estimates, a probit model was chosen because it assumes normality of the dataset. Estimation results are reported in Table 8.

The coefficients of credit access, gender, education, income, and age on a household's probability to save were strongly significant at 1% level of significance. The robust significance of these coefficients reveals that the variables significantly influence a household's saving decisions, whether positively or negatively. Credit access, negatively and significantly influence a household's saving decisions. A household head's access to credit decreases the household's probability to save by 10.3 percent points. This finding corroborates with the theoretical model which predicts a negative effect of access to credit on household savings. These results are also supported by Jongwanich (2010) and Kibet et al. (2009). Therefore, access to credit discourages savings for precautionary and for investment purposes as people are guaranteed of access to credit in cases of emergencies. Closely related to our findings is, Mbuthia (2011) whose findings revealed that loan repayment crowds out savings. These findings are not unprecedented considering that 49.4% of loan users reported to have drawn from their savings to repay loans and 20.3% of them had to sell their assets to repay their loans. Furthermore, borrowing to repay other loans drifts the savings and investment missions of households as they remain tied in indebtedness. 24.9% of loan users reported to have borrowed money to repay their existing loans. All these are potential reasons for the reduced probability to save as credit access becomes expansive.

Consistent with Keynes' absolute income hypothesis, this study finds a positive relationship between income levels and a household's probability to save. All the coefficients of the different income groups except the income group for Kshs. 400,000 and above are statistically significant and they are larger for higher income groups. The marginal effects for income increase as the income level increases. These findings lend credence to Ulwodi and Muriu (2017), Mbuthia (2011), Kibet et al (2009), Kiiza and Pederson (2002), and Keynes (1936). However, the study reveals a negative effect of income on a household's savings for income levels greater than Kshs. 400, 000 which supports Lee and Sawada (2010) who found a negative effect of income on household savings. Lee and Sawada (2010) attribute this to the fact that wealthier households have better access to credit facilities in cases of emergency as compared to poor households.

Turning to the level of education, the study revealed a positive effect of education on a household's decision to save. The coefficients for primary, secondary, and tertiary education

levels are all positive and significant at 1% level. The coefficients for the different education categories are larger for higher levels of education implying a positive effect of education on household savings. This can be attributed to the fact that higher education levels give people the relevant financial literacy hence a proper understanding of the existing financial institutions and their products. These findings corroborate with those of Ulwodi and Muriu, (2017), Helmy and Atalla, (2015), and Kibet et al, (2009), These findings are however contrary to Mbuthia (2011) who finds a negative relationship between education and household savings.

With regard to gender, the estimation results reveal a higher probability of savings amongst female-headed households compared to male-headed households. The study findings revealed that being a male as compared to a female household head reduces a household's probability to save by 0.16. The study also confirms the life-cycle hypothesis in Kenya as it reveals a non-linear relationship between age of the household head and the probability that the household saves. The coefficients of age and age squared were positive and negative respectively and were both significant at 1% level of significance. This reveals that an increase in the age of the household head by 1 year increases a household's probability to save by 0.0217 until a certain threshold beyond which an additional year of age to the household head reduces the household's probability to save by 0.0002.

The statistically insignificant coefficient for location implies that location doesn't influence savings behaviour. This can be attributed to the extensive penetration of bank branches, agents, microfinance institutions, and mobile money usage which have increased the penetration of financial products to the rural areas. Similarly, the household size doesn't influence household savings in Kenya. These findings are corroborated by Mbuthia (2011). We also established that marital status doesn't affect savings behaviour. Overall, credit access, education, and income are the leading determinants of household savings.

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**Table 8: Probit regression results**

VARIABLES	Coefficients
Access to credit	-0.308***

	(0.0993)
Urban	0.0691 (0.0436)
Male	-0.160*** (0.0455)
Age	0.0217*** (0.00675)
Age squared	-0.000265*** (6.48e-05)
Kshs. 3,001-15,000	0.310*** (0.0448)
Kshs. 15,001-70,000	0.745*** (0.0719)
Kshs. 70,001-400,000	1.426*** (0.318)
Kshs. 400,001 and above	-1.178* (0.676)
Primary education	0.302*** (0.0551)
Secondary education	0.423*** (0.0660)
Tertiary education	0.559*** (0.0881)
Divorced/ Separated	-0.124 (0.0854)
Widowed	-0.0444 (0.0822)
Married/Living with partner	0.00777 (0.0652)
Household size	-0.00965 (0.00997)
Constant	-0.00738 (0.187)
Observations	4,964

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Robust standard errors in parentheses  
\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

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Table 9 shows the marginal effects on savings behaviour. The marginal effects reveal that credit access influences households' probabilities to save more than income and education.

**Table 9: Marginal effects**

VARIABLES	Marginal effects
Access to credit	-0.103*** (0.0303)
Household location	0.0332** (0.0140)
Gender	-0.0329** (0.0135)
Age	0.00744***

	(0.00209)
Age squared	-9.59e-05***
	(2.02e-05)
Income group	0.0435***
	(0.00701)
Education	0.0723***
	(0.00800)
Marital status	0.00808
	(0.00654)
Household size	-0.00300
	(0.00315)
Observations	4,964

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Standard errors in parentheses  
\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

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## CHAPTER 5

### CONCLUSIONS

#### 5.1 Introduction

This chapter consists of the summary of the study, the main conclusions drawn, policy implications and related research gaps for further study.

#### 5.2 Key findings

Savings play a crucial role towards economic growth and poverty reduction. Despite this, the government of Kenya has not been able to mobilize savings efficiently. No wonder the country's gross savings as a percentage of GDP remains the lowest among the East African Community members. In the recent past, the government of Kenya has embraced financial inclusion as a frontline policy towards improving uptake of saving products by households. However, the extensive financial inclusion in the country (to 89%) has not been matched by any meaningful increase in household savings although it has been associated with extensive credit access. This has been facilitated by the emergence of microfinance institutions, mobile money usage, and FinTech institutions. However, the credibility and transparency of many credit lending institutions have been questioned following the concerns of their exorbitant interest rates and issuance of loans to people with poor or unknown credit score in a bid to recruit more customers. This portrays the under-regulation of the emerging credit institutions. As a result, the effects of the extensive access to credit have evoked mixed feelings and several research studies have been undertaken to establish the effect of access to credit on households' resilience to economic shocks, welfare, and poverty reduction.

This study was motivated by the emerging concerns that access to credit could crowd out savings through loan repayments and disincentives to save for precautionary and investment purposes that come with guaranteed credit access. The study employed the 2019 Kenya National FinAccess survey data. The main objective of this study was to establish the causal effects of access to credit on household savings in Kenya. On uptake of savings products, the study revealed that 67% of Kenyans save; with a narrow gender gap in uptake of saving products (66.6% males and 67.7% females). The study also revealed that there has been a considerable increase in the uptake of formal saving products with 50.3% of Kenyans reporting to be using at least one formal saving product. This reveals that although the proportion of Kenya's population

that relies exclusively on informal saving products remains exclusively high, a diversification and overlap of uptake of saving products has led to increased uptake of formal savings. On access to credit, about 94% of Kenyans have. Further, 48.7% of Kenyans were using at least one loan product during the time of data collection.

Employing a probit regression model, the study revealed a negative relationship between access to credit and household savings in Kenya. Further, the study revealed that gender, education, income, and age are significant determinants of household savings in Kenya. Households whose heads were female, educated, and with high income levels saved more compared to their counterparts. Further, the study revealed a non-linear relationship between the age of the household head and household savings.

### **5.3 Policy implications**

The results of this study have several policy implications. First, there is a need for proper training of households on credit usage to ensure that uptake of credit is channeled to investments and not consumption. The government should intervene in the regulation of lenders especially the upcoming FinTech lending institutions whose operations are still independent. These institutions have been characterized by exorbitant interest rates and are offering credit to customers with low or no credit score in pursuit for drawing a large pool of customers. This has exacerbated the indebtedness of many households. Furthermore, in support of government efforts to mobilize more savings from households, credit lending institutions can adopt a savings-first approach to lending.

The government should also make investments in education to ensure that majority of the population have at least secondary education and above. This is because by the time a person has acquired secondary education, they have the relevant financial knowledge which can boost their savings. The government should also come up with policies that can boost household incomes which would ultimately lead to higher savings. Recognizing that most Kenyan households rely on agriculture and MSMEs for incomes, such policies would include, and not limited to, a subsidy of fertilizers, negotiating better prices for farm produces, and giving soft loans to households to finance their businesses.



## **5.4 Conclusions**

The main focus of this study was to establish the effects of access to credit on household savings in Kenya. This literature gap had long existed despite the burgeoning credit expansion innovations and policies whose effects on household income, indebtedness, and ultimately savings had long been overlooked. Consistent with the theory and the savings model under borrowing constraints by Deaton (1991), the study revealed a negative effect of access to credit on household savings. Further, consistent to Keynes' absolute income hypothesis and the life cycle hypothesis by Ando and Modigliani (1963) and Modigliani and Brumberg, (1954), the study revealed a positive effect of income and a non-linear effect of age on household savings in Kenya. Other significant determinants of household savings in Kenya are education and gender.

## **5.5 Study Limitations and areas for further research.**

This study modelled determinants of household savings in Kenya using a cross-sectional data set and thus these results cannot be relied upon in the long run. It would be prudent for a similar study using a panel data set or pooled cross-sectional dataset to be carried out so as to establish the effects of access to credit overtime. Additionally, this study used a discrete variable as a measure of savings. A similar study could be carried out capturing savings as a continuous variable.

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## Appendix:

**Table 1: Savings by access to financial services**

Savings	Access to financial service					Total
	Formal Prudential	Formal Non-prudential	Formal Registered	Informal	Excluded	
Does not save	15.42	40.46	0.35	9.44	34.33	100.00
Saves	13.24	33.20	32.26	43.30	78.06	32.76
	49.25	39.66	0.36	6.02	4.70	100.00
Total	86.76	66.80	67.74	56.70	21.94	67.24
	38.17	39.92	0.36	7.14	14.41	100.00
	100.00	100.00	100.00	100.00	100.00	100.00

First row has *row percentages* and second row has *column percentages*

**Table 2: Savings by Wealth quintile.**

Savings type	Estimated Wealth Quintile					Total
	Lowest	Second Lowest	Middle	Second Highest	Highest	
Formal	23.28	32.92	35.97	41.23	45.15	35.90
Informal	76.72	67.08	64.03	58.77	54.85	64.10
Total	100.00	100.00	100.00	100.00	100.00	100.00

**Table 3: Credit access by education**

Credit access	Education level of Respondent					Total
	None	Primary	Sec	Tertiary	Other	
No access	7.40	36.77	34.53	21.08	0.22	100.00
	2.53	4.40	5.96	9.03	6.67	5.14
Has access	15.47	43.32	29.53	11.52	0.17	100.00
	97.47	95.60	94.04	90.97	93.33	94.86
Total	15.05	42.98	29.78	12.01	0.17	100.00
	100.00	100.00	100.00	100.00	100.00	100.00

Note: First row has *row percentages* and second row has *column percentages*

**Table 4: Credit access by the type of financial service accessible**

Credit access	Access to financial services					Total
	Formal Prudential	Formal Non-prudential	Formal Registered	Informal	Excluded	
No credit access	60.76	28.70	0.67	3.81	6.05	100.00
	8.19	3.70	9.68	2.75	2.16	5.14
Has credit access	36.95	40.53	0.34	7.32	14.86	100.00
	91.81	96.30	90.32	97.25	97.84	94.86
Total	38.17	39.92	0.36	7.14	14.41	100.00
	100.00	100.00	100.00	100.00	100.00	100.00

Note: First row has *row percentages* and second row has *column percentages*