

**DETERMINANTS OF HOUSEHOLD CHOICE OF SAVINGS DEMAND OPTIONS IN
KENYA**

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DECLARATION

This is my original work and has not been presented for any degree award in any other Institution or university.


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DEDICATION

I wish to dedicate this work to my parents- Stephen Muriithi and Teresia Maru.

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LIST OF ABBREVIATIONS AND ACRONYMS

GDP	Gross Domestic Product
PIH	Permanent Income Hypothesis
AIH	Absolute Income Hypothesis
RIH	Relative Income Hypothesis
MPS	Marginal Propensity to Save
APS	Average Propensity to save
MPC	Marginal Propensity to Consume
LCH	Life Cycle Hypothesis
MFI	Microfinance Institutions
MFB	Microfinance Banks

DEFINITION OF TERMS AND CONCEPTS AS USED IN THE TEXT

Household:

Group of people who are under the same roof of compound sharing basic facilities as well as making decisions about their lives together.

Household Savings:

This is the disposable income portion of a household that is not used for final consumption expenditure.

Household Choice:

The household decision made from a range of possible options.

Savings Demand Options:

Desired forms of holding the disposable income which are either formal or informal.

Formal Savings Option:

Formal savings option is under government regulation through Central bank of Kenya, categorized into Bank Savings Account, Postbank Account, SACCO, MFI/MFB and Mobile Money.

Informal Savings Option:

Informal savings option, though unregistered, they have structure that is appropriate organized.

Informal savings includes savings in Group/Chama, Group of Friends, family/friend and secret hiding place

ABSTRACT

The objective of this study was to investigate the determinants of household choice of savings demand options in Kenya. Most studies are not conclusive on the factors that inform households' choice of savings demand options. Moreover, a close analysis of the studied variables reveals that there exists a discrepancy in different findings of different variables. This study adopted a microeconomic approach and purposes to fill this gap discrepancy, by modelling the formal and informal savings models using the multinomial probit model. This study utilized the cross-sectional secondary data for analysis from the Kenya National Financial Access Household Survey 2019. We find that both household demographic and socioeconomic factors affect the savings decisions in Kenya. The study established that formal savings increases with education level, urbanization, marital status, employment formality, male gender as well as financial health whereas, it declines with family size. Age is also a key factor. The study recommends promotion of financial health, education programs, especially female education empowerment to encourage savings among female gender, as well as promotion of economic activities, creation of more employment opportunities and a conducive environment so as to enhance savings by the government.

CHAPTER ONE: INTRODUCTION

1. Introduction

Savings play a big role that cannot be overemphasized in propelling growth and investments. There is a synchronized slowdown in the global economy, whereby growth for the year 2019 is seen to downgrade again to 3percent which is the slowest pace observed since the financial crisis. It is a climb down from year 2017 by 0.8percent, whereby the world was observed to be in a state of synchronized upswing. Across all large markets that are emerging and more so developing economies, growth in the year 2019 has been revised down (Internationaler Währungsfonds, 2019).

In 2019, economic growth in Africa has stabilized at a rate of 3.4percent which is similar to the economic growth rate in 2018 but below the 5percent region economic growth average decadal. Economic growth in Africa since 2014 has slowed down for an average decadal of 5percent to around 3percent this is according to A. D. Bank (2019). To achieve self-sustained economic growth, most of the developing countries in Africa, have realized importance of mobilizing domestic available resources. The continuous rise of external debt in most of developing countries in the African region is as a result of inadequate domestic savings (Aryeetey & Udry, 2000).

In developing countries, domestic savings remains relatively low as compared to the developed world. When the national savings are sufficient, it provides the economy with huge benefits. A country that has high rates of savings can generate both domestic and foreign investments without depending on foreign debt. In every economy, the financial sector has the role of putting savings back to expenditure and income circular flow through investments. If savings and investments come from the domestic economy, more so from the household sector, they seem to be more beneficial. The most basic savings definition is the income and consumption difference (Hopf, 2006).

In East Asia, savings rate have doubled, where as in Africa saving rates have stagnated over the last three decades (Loayza et al., 2000). Several reforms aimed at improving the performance of the region's economies to boost the performance of indicators such as achieving higher rates of savings have most often failed to reach the expected targets. Factors such as high rates of inflation have resulted to people opting for real assets. More so, with high levels of financial illiteracy, savers prefer saving in non-financial or real assets. An additional factor that can also explain the

poor saving trends in Africa is absence of financial institutions especially in rural areas where the most of people reside (Aryeetey & Udry, 2000).

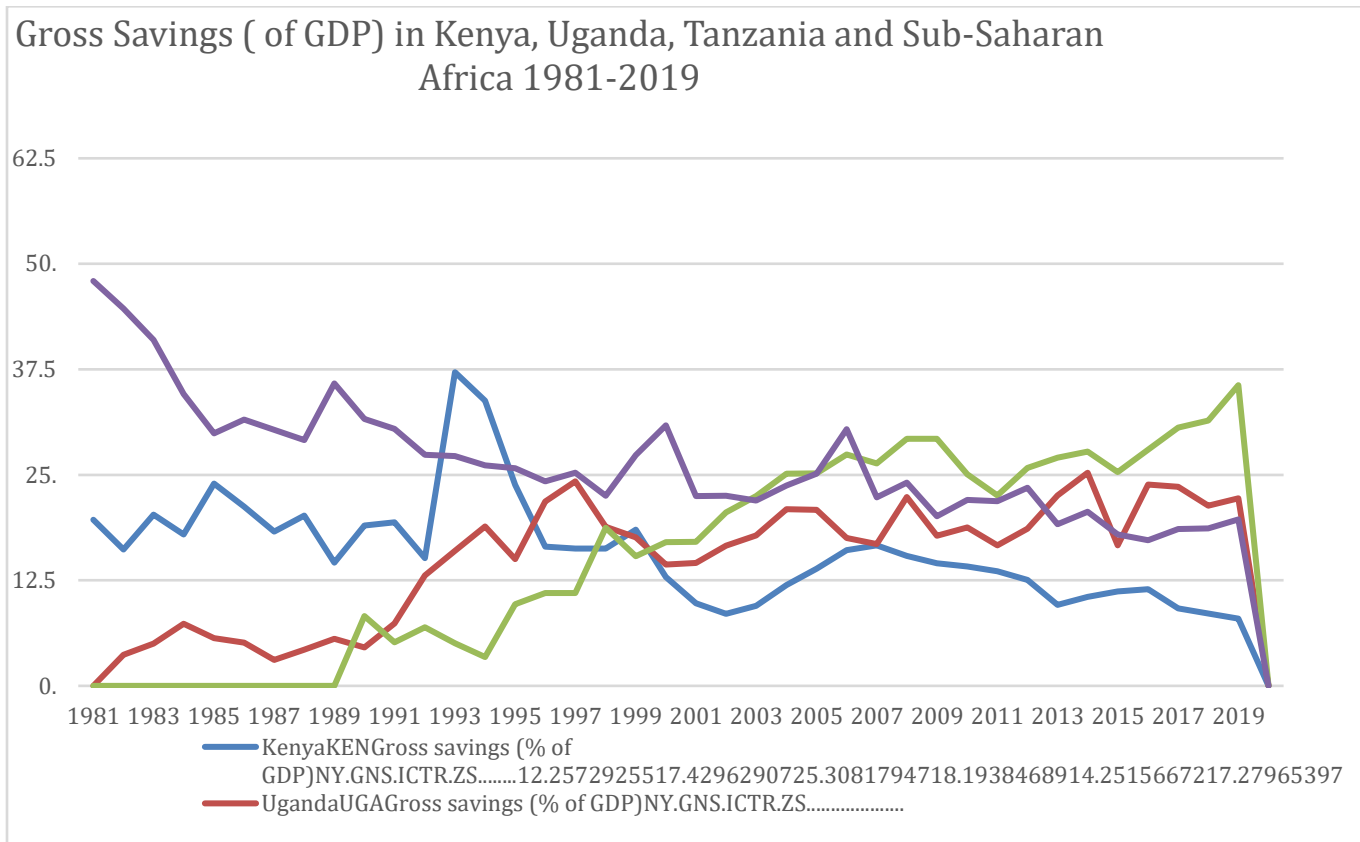
Domestic savings comprises of two parts; the public and private sector. The private sector has two segments; household and private corporate. The household sector is largest segment of private sector (Anandakumar & Glorinthal, 2015). In majority of developing countries, private corporate is usually not large, thus a negligible or small contribution to the total savings. Mostly, economies in developing countries have large governments' hence large public expenditures resulting to huge fiscal deficits thus leading to negative public savings. The household sector being a large sector of private savings worldwide, constitutes the main source of domestic savings. Household accounts for a large share of national savings (FinAccess, 2019).

In developing economies, savings plays the main role in the maintenance and sustenance of investments. Savings are key to development as they led to freeing up of resources which can be put into use towards improving the economies' productivity through improving machinery, capital equipment and more so improving of technological development. Growth in savings rate is a key precondition that facilitates achieving macroeconomic stabilization, sustained development, poverty reduction, economic growth more so price and financial stability. Hence, there is a need for saving a significant share of GDP to finance investments. Hence, there exists a positive connection amongst savings, investments as well as growth (Adewuyi & Bankole, 2010).

1.1. Savings in Kenya and an Overview of the Economy

Kenya's savings as a percentage of GDP has fluctuated from year to year and remained relatively low over the last decade. World Bank data estimates show that gross domestic savings as percentage of GDP in 2018 were averaged at 4.5 percent from 6.7 percent in the year 2000 while investments as a percent of GDP declined from 11.11 percent in 2000 to 8.43 percent in 2018, this represents a resource gap. This might affect the achievement of a double-digit economic growth goal of Vision 2030. During the period 1975-2017, the average savings value for Kenya taken as a percentage of GDP was 16.66 percent, whereby the minimum savings value was 8.53 percent of GDP in the year 2002 and the maximum value was 37.15 percent of GDP in the year 1993 (W. Bank, 2020). In the early 1990's Kenya's gross savings as percentage of GDP was more compared to the Sub-Saharan Africa, but in the past years, it seems to be low in comparison (World Development Indicators, 2020).

Figure 1. 1: Gross Savings (Percentage of GDP) in Kenya, Uganda, Tanzania and Sub-Saharan Africa 1981-2019



Source: World Development Indicators, 2020.

During post-colonial era, savings rate in Kenya was more competitive in comparison to other African nations. However, Kenya has been faced with political instability and mismanagement of resources resulting to economic downturn. Kenya’s economic growth rate had overtaken other African nation’s economic growth in the 1990s. Regardless of Kenya’s remarkable progress in economic performance, it’s still experiences restraints towards the preferred development path. Investment and savings levels in the country are low to support growth that is self-sustained.

Kenyan household's savings are lagging behind compared to other economies that are less economically endowed in the region, where they are not only low but also declining. In the 1980s Kenyan rate of savings was higher than in Tanzania and Uganda. But in the last three decades, it has stagnated letting them catch up and even surpass it (World development Indicators, 2020).

Savings are very important to Kenyans but it is affected by some factors such as high-income volatility. In rural areas, savings are mostly in non-financial assets form. Involvement in small-scale informal networks is often seen and thus it makes it hard for resource reaping for long-term investments. Formal institutions, mostly are concentrated in urban areas. High overhead costs, weak competition, poor credit information in the formal banking sector are some of the factors that affect the saving rate. There is also a wide interest gap between what the borrowers pay as the interest rates and what the savers earn on their savings (Loayza et al., 2000).

1.2. Household Savings in Kenya

Income earning for a large portion of households in Kenya is through informal trade, production of crops, and through employment. According to Finance access 2019, agriculture is the main income source for a third of adult Kenyan's. Most of these households particularly in rural areas, savings is in non-cash forms such as livestock whereas the urban areas, non-cash household savings is in form of real estates, durables as well as ploughing back in their businesses. As a result of factors such as low incomes, most households in rural areas prefer to keep their cash savings at home. Furthermore, Kenyans have been noted to prefer non-electronic saving forms as compared to electronic forms. However, recent years have seen a shift in this norm as most Kenyans are switching to mobile-based saving platforms, banks and other digital saving platforms (FinAccess, 2019).

Table 1. 1: Household Saving Options in Kenya (%)

Saving mode	MFI	Mobile bank	Mobile money	SACCO	Chama	Group of friends	Secret hiding	Post bank	Bank	Formal	Informal
Current use	1.5	16.8	43.6	10.9	29.2	7.7	23.6	0.7	7.7	55	29
Used to	1.1	5.3	4.7	2.4	5	3.4	5.7	1.5	1.4	4.1	5
Never	97.4	77.9	51.6	86.7	65.8	88.9	70.7	70.7	90.9	40.9	66

Source: FinAccess, 2019

Table 1.1 above shows that current usage of both formal and informal savings in the year 2019 averaged 55 percent and 29 percent respectively locking out a large section of the adult population regardless of the key role savings plays in smoothing both consumption and investment. In terms of choice of saving products, the finance access data shows that a majority prefer to save in mobile wallets at 43.6percent followed by informal groups the *chamas* at 29.2 percent and secret hiding places 23.6 percent in that order.

Savings options can be formal or informal. Formal savings is categorized into Bank Savings Account, Postbank Account, SACCO, MFI/MFB and Mobile Money. Informal savings includes savings in Group/Chama, Group of Friends, family/friend and secret hiding place. Formal savings option is under government regulation through Central bank of Kenya. In informal savings option, though unregistered, they have structure that is appropriate organized. Formal savings can also be categorized into digital and non-digital savings (FinAccess, 2019).

According to the Fin Access Household Survey 2019 report, there are several drivers of saving in Kenya. The factors that drive the usage of savings account in formal savings include; the security or safety concern 40.5percent, convenient or ease of saving money 25.3 percent, access in an emergency 8.9 percent, when saved here I can get credit 7.6 percent, when saved here by the end I can acquire lump-sum 5.1 percent, confidentiality 4 percent and most trusted 3.7 percent.

Moreover, there are several barriers to saving for vast majority whereby need for a regular income accounts for 42.3 percent and lack of enough money to save accounts for 38.3 percent. Both are income related (FinAccess, 2019).

Kenyan economy has been unable to generate sufficient savings for investments which has led to widening of the savings-investment gap. Most of the measures put in place in order to correct this has led to overreliance on donor assistance and foreign borrowing to cater for the planned investments. Capital inflows from industrialized countries have reduced. Kenya has also been riddled with limited ability towards servicing of the current external debt and thus resulting to escalation. For this reason, Kenya's projections to increase foreign capital inflows in future is poor due to limited ability to borrow (Njenga et al., 2018).

2. Problem Statement

Most studies done have embraced a macroeconomic approach, of which the economic unit's behavior on an aggregate level may not be necessarily similar to an individual level, Ndirangu, E., & Muturi, W. (2015). Researchers have given little attention to household savings. Irrespective of household's savings taking a lions' share, most studies have ignored household savings and instead focusing on aggregate savings (United Nation, 1962).

The studies that have adopted a microeconomic approach, some have exhibited mixed results and more so, most of these studies are not national wide representative Kibet et al., (2009). Some of the determinants appear to have an ambiguous effects on household savings and the significance seems to be mixed up. Moreover, a close analysis of the studied variables reveals that there exists a discrepancy in different findings of different variables. For instance, Kibet et al. (2009) found a positive relationship between education and savings while Amimo et al. (2004) found a negative relationship. This study purposes to fill this gap discrepancy by investigating the determinants of households' choice of savings demand options in Kenya: formal and informal savings using national household survey data, by modelling the formal and informal savings models.

3. Research Question

This study seek to answer the following research question:

- (i) What are the determinants of households' choice of savings demand options in Kenya?

4. Objectives of the study

The main objective of this study is to investigate the determinants of households' choice of savings demand options in Kenya.

Specific objectives:

1. To investigate the determinants of households' choice of savings demand options in Kenya.
2. To offer policy recommendations based on study findings.

5. Justification of the study

Unmasking the saving behavior of a household is of great importance to the policymakers. Especially the financial service providers as well as the management of financial institutions the study will be beneficial to them. Whereby from the findings, the financial service providers will be able to make policies that will promote savings in formal channels and in which factors to consider when designing their products. The government will also come up with policies and programs that create opportunities that result to increase in savings rates based on the study findings. With increased savings, the government will reduce the level of reliance on international financing or external borrowing to finance their investments which have resulted in debt levels increase in the past.

The study is significant in contribution to the existing literature and data. Specific literature in Kenya, on the saving behavior of households is relatively scarce while existing literature is outdated and does not capture recent global economic and social developments.

Secondly study findings is of importance to researchers who will be interested in the study area in the future as this area has received limited attention. The study findings will be used as the basis for further research where other researchers will be able to explore and extend it. The study also suggest or recommend areas for further research from the findings.

Furthermore, the study finding is beneficial to investors. An increase in access to saving products would result in improvement of investments thus spurring the overall economic growth. Savings plays a great role in maintenance and sustenance of investments. Increased savings translates to improved wellbeing of households, thus a high purchasing power which is crucial information for investors.

1.6 Organization of study

Chapter one is the introduction. Following this introduction is chapter two, we have theoretical and empirical literature review as well as the overview of the two on household savings demand options. Chapter three discusses the methodology which includes the theoretical framework, empirical model, definition of variables and the expected signs of coefficients, data type and sources, analytical techniques and diagnostic tests. Chapter four presents the empirical findings and discussions. Chapter five provides the summary, conclusion, the policy recommendations and areas for further studies.

CHAPTER TWO: LITERATURE REVIEW

1. Introduction

This chapter presents the theoretical and empirical literature review as well as the overview of the two on household savings demand options.

2. Theoretical Literature

A country's household savings rate is determined by various factors. This section analyses the theoretical framework of those factors. In most theories of saving, both consumption and saving are considered together, since a household making consumption decision, affects the decision of not saving the amount consumed. Individuals tries to maximize utility and minimize expenditure thus assumed to be rational. In economics, between assets and income there is little difference since both can be used for financing consumption. A person makes a choice between present and future consumption which reflects the preference. Economists accept that household's expenditure is a function of income of a household but disagree on which income such as short run or permanent income or income over life time, relative or absolute income, future expected income or current income. Several theories relating to savings include:

2.1. Absolute Income Hypothesis (AIH)

According to Keynes (1936), consumption behavior function is stable and henceforth savings. Therefore a fairly stable relationship of current income with consumption, thus savings. The systematic theory of household consumption expenditure aggregates was first developed by Keynes. Thus assumes that consumption is a function of current disposable income. Through MPC, Keynes links consumption to income levels.

Absolute income hypothesis assumes that MPC out of disposable income ranges between 0 and 1 thus, is positive but less than 1. It is a short run theory. Therefore current consumption of a household's is taken as real current income positive function that is disposable. Thus as income increases, a share of increment is consumed while the other is saved.

With an income increase, the MPC declines which implies that the MPS increases when income increases. The implication here is that families with low incomes saves a smaller portion of income in comparison with families with higher incomes. The idea that MPC is positively related to the income of the absolute income hypothesis was accepted at first but other empirical studies have

presented that over time MPC is constant (Kuznets, 1946). Regardless of a constant of a consumption function, it does not alter the absolute income hypothesis proposition that consumption increases with an increase in disposable income.

2.2. Relative Income Hypothesis (RIH)

Duisenberg (1949) proposed another theory of consumption, whereby after the World War II, due to contradictions of absolute income hypothesis and more so observed facts, studies were carried out to resolve those contradictions. Relative income hypothesis states that consumption expenditure in a household is a function of household's relative income, which is an average of neighborhood household's income where household resides or as the highest household's income reached in near past.

In case of a fall in a household's income, the household either borrows or dis-saves so as to avoid a huge fall of the standards of living more so maintaining standards of living at par with the peer groups they belong. This distinct relative income hypothesis from the AIH. According to RIH, long run APC is less than short-run APC. Thus long-run APS remains larger than short-run APS. Regardless of whether an income increase is large or small, an increase in income is at all times proportional to household's consumption expenditure increase. Nevertheless, empirical evidence shows that unexpected and large income increases can result to initial less than proportionate consumption increase.

In the short run according to relative income hypothesis, consumption standards are observed as irreversible while in long run they are not since cannot maintain standards of living through borrowing or dis-saving as if income continues to decrease it is not sustainable. According to relative income hypothesis, both consumption and income change in similar direction, thus recession is accompanied by an aggregate consumption expenditure decrease. After the World War II between 1948 and 1949 in US, this was contradicted as consumption expenditure was increasing while disposable income was falling. Duisenberg relative income hypothesis was an important improvement of the Keynes absolute income hypothesis.

2.3. Permanent Income Hypothesis (PIH)

Friedman (1957) proposed PIH whereby it makes use of current consumption to determine lifetime or permanent disposable income. According to Friedman, current income, as a result of lag effects

could not clarify current decisions of a household thus there was essential to find a better income measure. Permanent income was taken as an average of all incomes that a household expects in long run through estimating the expected incomes from capital and labour. PIH is based on assumption that household objective is to maintain a smooth or a stable consumption path through equally allocation of lifetime resources in each life period.

Household consumption in every period corresponds with the permanent income taken as annual sum of total assets that household owns as well as future expected income that is discounted. This income gives similar present value of a household's lifetime resources as of that inferred by its intertemporal budget constraint. Transitory income can either be negative or positive, and that differentiates present from current permanent income value. Savings is taken as a transitory component of current disposable income. Expected income that is transitory in the long run is zero since transitory income can be zero, positive or negative.

The primary determinant of the household consumption is the permanent income whereby a household's consumption level, corresponds with permanent income changes and not the transitory income. There exists no correlation between permanent and the transitory incomes. Borrowing and saving are used for the purposes of consumption smoothing. According to Friedman, relative shares differences, in both permanent and transitory incomes are reflected in the household savings differences.

Income pattern time though not very significant to consumption, it is important to savings as household savings in a given period, is current income less expenditure on current consumption. Lifetime resources expected determines consumption, thus savings over short time periods replicates current income departures from average of ones life's resources. Transitory changes in income over short run have slight effects on spending patterns of a consumer. Constant share of permanent income is consumed by households. Thus, low income households have higher MPC compared to high income households. Hence MPS is higher in the high income households.

Friedman's theory is based on the assumption that MPC is equal to APC through all periods. In cross section data, it would depict that similar portion of income is consumed by both the rich and the poor. Researchers such as Friend and Kravis (1957) questioned this and noted that high-income earners have a lower APC compared to the low-income earners. As the permanent income increases, the MPC reduces. The theory is also based on the assumption that both transitory

consumption and transitory income are unrelated thus, MPC for permanent income is one while for transitory income the MPC is equal to zero. And this is a contradiction to the idea that APC and MPC are constant.

The consumption expenditure is likely to be cut down in case of loss of income by individual through theft, thus the idea that both consumption and transitory income are unrelated might be invalid. According to Modigliani et al. (1977), permanent income hypothesis is considered as a superior policy guide so as to realize economic goal than the RIH and AIH such that a policy taken by any government to reduce taxes, regarded by households as permanent would result to immediate spurring of consumption thus over a longer period increasing national income through the multiplier effect.

2.4. Life Cycle Hypothesis (LCH)

Ando & Modigliani (1963), Modigliani & Ando (1957) and Modigliani & Brumberg (1954) proposed LCH. This theory represent consumption that is under certainty and its one of the major neoclassical savings theory. It is similar to PIH with the exception of the lifetime income definition. In LCH, savings and consumption reflects or reveals one's life cycle stage or a person's age. According to the theory, over time, an individual smoothens consumption by considering anticipated resource changes as a result of age or education as well as changes in savings return expected changes. The resources are taken as the net wealth existing and the incomes from the future and current labour in present value. For a rational consumer, consumption expenditure is planned based on entirely on all available resources through allocating them over time to consumption in a way that over lifetime one maximizes utility. Current consumption and income has little connection according to this theory and expenditure on consumption over time is constant.

A typical individual's life in early years, consumption is likely to be high while earnings are comparatively lower, thus consumption exceeding earnings, individuals borrows so as to finance deficit. More so during these early years of life, one try's to increase the chances of raising earnings in the years later in life through building human capital. By middle age, the high levels of human capital already built helps in improving the earnings which are more than the consumption expenditure. It is in this age where by savings are positive, thus one saves for the old age and more so the debts acquired in life earlier are paid. As years or age progresses, there is decline in income

if one retires particularly if an individual was employed. Income goes lower than consumption resulting in negative savings. One tries to adjust the expenditure downward through dissaving until death.

As a result of anticipation of future income increase, the young result in saving relatively less. Whereas the middle aged who are close to their earnings pick up more, paying earlier debts and more so accumulating savings as they anticipate a lower income after they retire. The elderly generally have a low or even negative savings. A rise in youth dependency or elderly to working population ratio results in a fall of savings rate. In any country the larger the total wealth share held by individuals who are middle aged, the more the savings resulting in high income growth rate. Long term savings trends are likely explained by the demographic factors but not the short term fluctuations in the consuming propensity.

Both permanent and life cycle hypothesis are based on the assumption that households can perfectly visualize their future levels of consumption, income flows, their life span and more so behaves rationally with self-control preparing for retirement. Households with low income are most likely faced with financial information that is limited. To smoothen lifetime consumption, middle-aged household income during working life should exceed consumption expenditure. More so should have credit access or have savings in order of financing extra expenditure in case of low incomes. According to Wilcox (1991) any income changes that is predictable affects both consumption and savings in contrary to the PIH and LIH.

2.5. The Mc Kinnon-Shaw Hypothesis

Shaw (1973) and McKinnon (1973) independently developed this theory, which states that there should be liberalization of financial markets and more so developing economies should allow the market forces in determining investment rates, real money balances demand and interest rates. Hence, savings rate of return given by rates of interest results in positive result on savings. Policies resulting in financial repression leads to reduction of saving incentive. Savings rate reduction results in decrease in investment rates leading to low growth. Therefore, they established that high interest rates as a result of financial liberalization results in increase in household savings.

The ability and willingness to save are representation of inter-temporal choices between future and present consumption levels. Real interest rates on savings therefore, has a general positive effect.

Thus, interest rates that are high prompt economic agents postponing consumption in present so as to earn interest on income in future. Nevertheless, governments purposely retained rates of interest below market clearing for purpose of domestic savings promotion of which it has been less impressive since the levels of saving have continued to decline as the low savings returns do not offset rising inflation sufficiently.

As a result of this the theory explains government role in mobilization of savings by a hypothesis of financial repression whereby it examines the government policy effects through controlling interest rates as of adjusting to such levels that are competitive so as to clear the market.

According to Mc Kinnon (1973), not every economic agent shall have credit access if interest rates are controlled and this can result to two scenarios whereby firms able to access the subsidized credit, engage in projects that are capital intensive whereas that are not policy favored would embark on huge returns short maturity projects. According to this theory, financial repression leads to substitution of market from non-market forces from interest rate determining which is manifested by available funds rationing to the investors. Removal of financial restrictions among countries where there is control of interest rates, it results to positive effects towards growth rates on the market equilibrium that is competitive (Gemech & Struthers, 2003).

Most nations have resulted to liberalization programs to make savings real return more attractive to savers and more competitive. Thus a devised ways of increasing investments, saving as well as growth. Regardless of a trade-off between interest rates as well as investment levels, laying a balanced investment, more so savings proportion is crucial achieved through adjustment of saving rates.

2.6. Rational Expectations Hypothesis (REH)

Based on expectations, Hall (1978) estimated a consumption function of which it applied weak efficiency assumptions such as according to Bodie et al. (2004), the belief that present values can be explained by the past values. Hall (1978) made a conclusion that assuming consumers are rational, current consumption behavior is determined by the past consumption values. The theory assumes that consumption patterns track is kept by the economic agents. Consumption at any period of time takes into account the already known information and income's future flow expectations of a consumer.

An economic agent will try to smoothen out if in any case there are expectations of consumption falling such that an individual adjusts through increasing savings. Individuals borrows or depletes income saved when consumption is expected to rise so as to meet the consumption levels required.

3. Empirical Literature

This study, reviews various empirical studies done that captures savings. Many of empirical studies in developing and developed countries examining household savings have been carried out. Most of these studies examined various determinants or variables such as income, assets of the household, household size, financial literacy, marital status, livelihood, sex, financial institutions depository rate, households head age and education.

Income and household savings

Schmidt-Hebbel et al. (1992), used a sample of ten countries that are developing, by combining cross-country and time-series observations to estimate individual household saving functions. The research tested the responses of households to income, demographic variables, and rates of return, interest rates, monetary wealth, inflation and foreign savings. According to the study, income variable has a positive impact towards savings. A study by Agrawal et al. (2010), during the period 1962-2004 on the determinants of savings in India used co-integration procedures. The findings of this study showed that high income improved savings significantly in India during this period.

Mody et al. (2012), carried out a research using panel data in the advanced countries during the period of Great Recession on precautionary motive of saving and found out that high labour uncertainty was highly significantly associated to higher household's savings. Ozcan et al. (2003) explored the private savings in Turkey from 1968 to 1994 and results showed income levels has a positive impact towards private savings. A study in Russia by Gaisina (2014), on saving behavior on households also showed a positive MPS out of income which agrees with the theory that arise in income levels leads to a rise in savings levels. Kibet et al. (2009) explored on determinants of household savings in Kenya and the study findings confirmed positive relationship amid income and households saving.

Assets and household savings

A study by Amimo et al. (2004) found out that among rural households in Mozambique, decisions to save are responsive to the amount of assets that a household owns and also responsive to the

income. Friend & Taubman (1966), studied savings behavior employing target savings model whereby assets holdings are key to saving behavior. Lack of data made them use they used past savings as wealth proxy. The coefficient had a negative sign but highly significant. Holding large assets was highly associated to a balance amongst actual more so the desired asset holding as well as low savings. Choudhury (1968) also used household's assets savings proxy and the study findings confirmed so.

Household Size and household savings

A study conducted by Choukhmane et al. (2013) using family size variation in 1970's (induced by One Child Policy), found that policies of family planning have led to a rise in the household savings and accumulation of retirement wealth. An econometric analysis by Snyder (1973), on Sierra Leone's behavior of household savings using regression analysis used the size of household in the econometric model as an explanatory variable. Results showed household size did not affect the probability of the positive savings for the sample. Either small or large household sizes similarly, it possible for savings to be positive regardless of different savings amounts. By considering nuclear and extended family in the analysis, the results showed that savings in a nuclear family is higher compared to extended family, since in the extended family the amount set aside for savings is limited as income is distributed to many items.

Sex and household savings

A study conducted by Floro & Seguino (2002), examined the effects of gender on the aggregate saving. This was conducted by studying the hypothesis that leads to shift in relative income of women affecting their bargaining household power and have adverse effects on household saving due to different gender saving propensity. An analysis of non-pooled and pooled household savings was carried out to examine reason for the differing of the men and women saving propensity as well as in what way wage earnings of a woman change in relation that of men affects savings of a household.

Empirical analysis by panel data was conducted consisting of twenty economies that were semi-industrialized from 1975 to 1995 and the findings indicated that an increase some women bargaining power and measures income discretionary, there is a rise in the aggregate savings thus indicating significant gender effect towards savings. The results showed the significance of

household level gender relations while planning mobilization of savings and more so in formulation of both investment and financial policies.

Denizer et al. (2000) based on matching household survey, explored household savings rate determinants in transition economies. By regressing savings on income, age, sex and employment the findings showed that households that are male-headed have relatively higher savings compared to female-headed.

Age and household savings

Athukorala & Tsai (2003) found out a negative effect on rate of saving by both the young and old. Gedela (2012) study in India on factors affecting rural as well as tribal households saving behavior using regression model, findings showed that age of household head affected savings. Other factors that influenced savings are sex, medical expenditure, dependency ration and income.

A study by Attanasio (1997) in United States of America and United Kingdom, showed a hump-shaped curve or a curvilinear relationship which shows a non-linear relationship between savings and age. Individual's age is likely to have a negative effect on savings where old aged save less whereas young save more while noting younger people may have no income to save or they are often net borrowers.

Newman et al., (2008) conducted a study on households in rural Vietnam using descriptive statistics, on factors that affect household decision to save in informal as well as formal institution. Findings indicated age had no impact on savings decision in formal financial institutions while it had a negative effects in informal financial institutions.

Education and household savings

Study by Kibet et al. (2009), in Kenya using OLS regression, found that savings in the household was affected by education level and other factors like age of household head, occupation, gender, income and access to credit. Denizer et al. (2000) carried out a study on household's savings rate in transition economies by regressing savings on variables such as education. Evidence on education violated the usual positive elasticity of education finding on market economies savings, concluding it was consistent to income profile that were flatter, expected households that are less

educated. Study furthermore concluded for all the countries considered, for age group 30-49 savings levels are lower than age group 50-64.

Kiiza & Pederson (2001) also confirmed that more educated household heads utilizes formal savings in Uganda, though the study didn't include factors such as household heads income and age.

Amimo et al. (2004) study on household financial savings decision in the rural Mozambique using OLS revealed a negative relationship between social factors such as levels of education and savings. Bernheim & Garrett (1996) in their study found out that the rate of savings rises with education level. Lower education levels translates, the lower the rate of savings.

Marital Status and household savings

A study by Njenga et al., (2018), shows that when two adults, through marriage union come together, the pulling of the accumulated resources together can raise their wealth. Thus marital status has a positive as well as a significant effect on savings of a household.

Livelihood

A study by Amimo et al., (2004) in Mozambique and Kibet et al. (2009), in Kenya shows that livelihood has an impact on savings, it is the main economic activity of the household head. The findings shows a rise in dependency leads decreased savings thus a negative relationship. Livelihood category comprises of elderly and students who usually rely on government, friends and family for transfers for their daily subsistence.

Boring (2010) examined motivations behind institutional choice and saving behavior in Uganda households for formal, informal, semiformal and non-institutional financial institutions using binomial probit model. Formal employment and entrepreneurial income activities statistically increased chances of saving in formally.

Interest rates and household savings

Interest rate is considered as one of economic factors affecting savings levels. Most of studies in several countries on interest rates have reported a positive effect towards savings, while others have indicated an inverse relationship between savings and interest rates (Frączek, 2011). Kibet et al. (2009), using ordinary least squares method, indicated that liberalization measures adoption resulted to an increase in interest rate. However, savings remained low. Earlier expectations

included a rise in both savings and investments due to a rise of interest rate, though this hasn't been the case in developing nations.

Olusoji (2003) carried out a study in Nigeria on savings and found out government deficit had effects on savings, exchange rate, income but rates of interest had no effect on savings. A study by Kudaisi (2013) in West Africa during the period 1980-2006 on the determinants of domestic savings based on Hall's consumption hypothesis showed interest rate had a negative as well as insignificant effect on domestic savings.

Financial Literacy

Study findings on Savings in Uganda by Chowa et al., (2012) shows rate of saving increased with an increase in financial education or literacy. Savings and financial literacy has a positive relationship.

Financial Health

According to FinAccess (2019), a household's financial health is measured by assessing their ability of using financial services in order to manage their day to day needs, mitigate potentially catastrophic shocks and achieve their goals. Several selected variables which include ability to raise money for emergencies, gone without food, saving for old age, putting money aside for future use among others were used to construct a financial health index. Individuals who are more financially healthy tend to save more.

Inflation and household savings

Epaphra (2014) study in Tanzania over the period 1970-2010 on factors affecting savings using Granger Causality test and time series data showed that population growth, life expectancy positively impacted on savings whereas inflation negatively impact savings. Hopf (2006) shows that savings are affected in the opposite direction by the inflation variations such that uncertainty increase on future income. High degree price variability might result to a rise in saving rate as high inflation rates goes together with return on savings thus having a depressing effect on the saving decision. Schmidt-Hebbel et al. (1992b) investigated the determinants of saving by estimating behavioral savings function. Results indicated a negative and insignificant effect of inflation and interest rates towards savings.

Credit access and household savings

According to Rogg (2000), credit access has impact on savings since consumers who are impatient borrow and consume in present while saving less. For the patient consumers, no savings change occurs. Thus, credit access improvement impacts savings negatively. However, Rogg (2000), used a probit model showed a positive relationship between credit access and savings. According to Terrones & Carderelli (2005), credit availability improvement causes decline in savings rates in most of industrial countries.

Residence and household savings

A study conducted by Kiiza & Pederson (2001), using logistic model in Uganda on determinants of household savings showed that urbanization, income and education are key drivers of savings and have a positive impact towards savings. Atieno (2001) carried out an empirical assessment in Kenya, findings showed that savings and urbanization have a positive relationship.

Carpenter & Jensen, (2002) carried out a study in Pakistan on factors relevant towards choice of informal and formal savings by an individual using household locality as one of the factors. Due to lower costs of transaction as well as better organization in urban areas increased formal savings.

4. Overview of the Literature

From empirical and theoretical literature review it can be concluded, determinants of household savings are quite a number. As a result of differences in economic, demographic and social condition in different countries, factors that have well enlightened household savings in a country may be unsuccessful in a different country. Some factors might in one case be significant while not in others. Therefore, it is important to carefully examine each case while considering the characteristics (Newman et al., 2008).

Most studies carried out on savings in Kenya have generally focused on Macro-economic factors such as per capita GDP, inflation, and interest rates, Ndirangu, E., & Muturi, W. (2015). Only a few studies have been done on factors that inform households' choice of formal or informal savings demand options and most of them are not conclusive on these factors Kibet et al., (2009); Newman et al., (2008). The few that are accessible are from across different countries either in rural areas or in poor households such as studies by (Newman et al., 2007; Boring, 2010; Kiiza & Pederson

2001; Amimo et al., 2004; Carpenter & Jensen, 2002) . For analyses purposes, some of the studies have adopted a descriptive statistics such as study by Newman et al., (2008).

Some of the studies that have adopted microeconomic approach have exhibited mixed results. And a number of these studies including Kibet et al., (2009), relies on a small sample size which limits the national level aggregation. Some of the factors appears to have an ambiguous effects on household savings and these variable's significance seems to be mixed up. Moreover, a close analysis of the study variables reveals that there exists a discrepancy in different findings of different variables Amimo et al., (2004); Kibet et al., (2009). This study purposes on filling this discrepancy gap. The using the household survey data that is national wide representative to overcome the sampling biasness. This study is broader, by employing multinomial probit model in modelling the differences in the choice of savings demand options; formal and informal savings among Kenyan households across income groups, livelihood, income groups, sex, education, financial health, age groups and regions.

CHAPTER THREE: METHODOLOGY

1. Introduction

This section contains theoretical framework, empirical model, variable definition and the expected signs of coefficients, data type and sources, analytical techniques and diagnostic tests.

2. Theoretical Framework

From the previous chapter, savings theories are mirror image of consumption theory. Since income is either consumed or saved, any theory that explains allocation of income towards consumption can as well be used in explaining savings. This study borrows from the permanent income hypothesis and the life cycle hypothesis. From the two theories, current consumption changes are attributed from being dependent on long-term income expectations. In order to include the specific Kenyan household characteristics, slight modification on the LCH main features are made.

Romer (2005) in defining savings, applied the consumption theory under PIH. In this theory, an individual living for a (T) life period is assumed to have a utility function in the form below.

$$U = \sum_{t=1}^T u(C_t) \text{ Where } U'(\bullet) > 0 \text{ and } U''(\bullet) < 0 \dots\dots\dots(1)$$

C_t Represent consumption in a period t while $U(\bullet)$ is instantaneous utility function. An individual is taken to have (A_0) as the initial wealth endowment and labour income (Y_1, Y_2, \dots, Y_T) over life time-period T. An assumption is made that an individual can borrow or even save at an interest rate that is exogenous and at the end of one's lifetime, outstanding debt has to be repaid. Individuals' budget constraint is in the form below.

$$\sum_{t=1}^T C_t \leq A_0 + \sum_{t=1}^T Y_t \dots\dots\dots (2)$$

Given $U'(\bullet) > 0$, individual expenditure in consumption corresponds to their respective budget constraint and thus the optimization problem of an individual can be written as:

$$L = \sum_{t=1}^T u(C_t) + \lambda(A_0 + \sum_{t=1}^T Y_t - \sum_{t=1}^T C_t) \dots\dots\dots (3)$$

From utility maximization first-order, over time, marginal consumption utility is usually constant. The consumption levels determines marginal utility, thus over time, consumption is also assumed to be constant. Factoring this into the budget constraint, it leads to the equation below.

$$C_t = \frac{1}{T} (A_0 + \sum_{t=1}^T Y_t) \text{ For all } t \dots\dots\dots (4)$$

This shows that for each period of individual's lifetime, one consumes an equal amount of resources. Thus from consumption saving relation we have:

$$S_t = (Y_t - \frac{1}{T} \sum_{t=1}^T Y_t) - \frac{1}{T} A_0 \dots\dots\dots (5)$$

From the above equation, when permanent income exceeds current income, savings becomes negative. According to Romer (2005), it acts as the foundation of PIH. Savings is taken as future consumption in the PIH and the interest rates is the opportunity cost of current consumption postponing for a higher level of consumption in future. Thus equation (2) can be expressed as:

$$\sum_{t=1}^T \frac{1}{(1+r)^t} C_t \leq A_0 + \sum_{t=1}^T \frac{1}{(1+r)^t} Y_t \dots\dots\dots (6)$$

From equation (6), equation (5) can be written as:

$$S_t = \left\{ \left(\frac{Y_t}{(1+r)^t} \right) - \frac{1}{T} \sum_{t=1}^T \left(\frac{Y_t}{(1+r)^t} \right) \right\} - \frac{1}{T} A_0 \dots\dots\dots (7)$$

Above equation, shows that when the current income present value is higher than its average, savings would increase. Interest rates constitutes of income effects and substitution effects. Thus present value of income increase does not necessarily result to savings increase, the factor that overrides the other determines the change.

According to Ando & Modigliani (1963), individuals are forward looking due to the absence of the link in the LCH between current income and current saving. Thus individuals decide to save on lifetime income rather than current income. In this study this approach will be applied with modification in order to incorporate the demographic characteristics of a household.

3.3 Empirical Model

This study is motivated by the Random Utility Hypothesis by McFadden (1974). It assumes that if a household has various options, it usually goes for the option that derives high utility. Utility function is written as follows:

$$U_{in} = V_{in} + \varepsilon_{in} \dots\dots\dots (8)$$

V_{in} Is the deterministic utility, ε_{in} is the uncertainty in the household utility, i is the saving option and n represents the household. The deterministic part V_{in} is a function of observed variables while the random part ε_{in} , follows a normal distribution.

From the choice set C_n , the probability that an option i is picked is written as follows:

$$P(i, C_n) = [U_{in} \geq U_{jn} \forall j \in C_n] = P\{U_{in} = \sum_{j \in C_n} \max U_{jn}\} \dots\dots\dots (9)$$

In the multinomial probit, choice is made from three alternatives as defined in the below general specification.

$$p_{ij} = Pr[s_i = j] = F_j(x_i, \beta), j = 1, 2, \dots, m, i = 1, 2, \dots, N \dots\dots\dots (10)$$

x_i Represent regressors, β represents the parameters estimates, j represents the possible alternatives, while F_j is the functional form with probabilities lie between 0 and 1 and sum j to 1.

This study will employ the multinomial probit model as the dependent variables are categorized as currently use formal savings, used to have formal savings as well as never used formal savings. This also applies for the informal saving. But our main interest is on those who currently use formal and informal savings.

Njenga et al.,(2018) and Mwangi & Sichei, (2011) also used multinomial probit in their research to model full correlation matrix of residuals. Probit model is superior in comparison to multinomial logit as it allows for correlation of residuals in countering the Independence of Irrelevant Alternatives problem (IIA). Probit model assumes that error terms are multivariate normally distributed and more so are correlated across the choices while logit assumes a logistic distribution. It helps in correcting for blue bus red bus paradox in the multinomial logit. Thus, introduction of new alternatives can alter household choice (Cameron & Trivedi, 2005).

The household saving decision is expressed as follows:

$$S = \beta_0 + \beta_z Z_i + \varepsilon_i \dots\dots\dots (11)$$

Where $i = \dots N$,

S is dependent variable and it's representing savings demand options categorized as; those current using Formal savings as well as Informal savings.

Z represents the various determinants of household savings demand decisions which include education, age, financial health, sex, income, livelihood, marital status and household size. This is from the previous literature review, where a number of theories and empirical studies postulates various factors affecting household savings. These factors are demographic, social as well as economic in nature.

1. Variable definition and the expected signs

Dependent Variable

The dependent variable is savings demand options that is categorized as;

Current use formal savings

Current use informal savings

Independent Variables

Table 3.1 below provides a summary of the list of independent variables, definition, measurement, expected sign and the description.

Table 3.1: Variables Definition, Measurement and expected Signs

Dependent Variable	Measurement	Expected Sign	Description
Savings demand	Based on currently use of formal savings as well as informal saving.		
Independent Variable	Measurement	Expected Sign	Description
Household income	Based on income group of household head.	Positive	Kibet et al. (2009); Friedman, (1957)
Household size	Total number of people living in a household.	Negative	Choukhmane et al. (2013); Ando & Modigliani (1963)

Education	Based on the household's head highest level of education attained.	Positive or Negative	Kibet et al., (2009); Amimo et al., (2004)
Residence	Dummy variable. Based on the household head residence. 1 if urban, zero otherwise	Positive (Urban)	Kiiza & Pederson (2001); Atieno (2001)
Household Sex	Dummy variable. 1 if the household head is male, zero otherwise	Positive (Male)	Denizer et al. (2000); Floro & Seguino (2002)
Age	Age of the household head in years	Positive	Kibet et al., (2009); Amimo et al., (2004) Ando & Modigliani (1963)
Age squared	Squared age of household head in years	Negative	Kibet et al., (2009); Amimo et al., (2004)
Marital Status	Dummy variable. 1 if the household head is married otherwise zero	Positive (Married)	(Chowa et al., 2012); Njenga et al., (2018)
Livelihood	Categorical variable. Based on based on household head main economic activity.	Negative (Dependant)	Amimo et al., (2004); Njenga et al., (2018)
Financial Health	Dummy variable. Based on the financial health status of the household head.	Positive	FinAccess (2019)

Source: Author

2. Data type and Source

The study will use the most recent cross-sectional secondary data for analysis from the Kenya National Financial Access Household Survey 2019, collected by the Central Bank of Kenya, Financial Sector deepening and the Kenya National Bureau of Statistics. Survey sample a total of 11,000 representative households, with rate of response being 89% of 9709 households. The report consists various indicators which are representative at the national level.

3. Analytical Techniques

The study employs econometrics in order to analyze the data. To estimate household savings demand options model, STATA software package will be used.

4. Diagnostic tests

Diagnostic tests are carried out to ascertain whether the data fits the model. When carrying out regression analysis, one may not have surety of whether the obtained results represents the realities. The diagnostic tests include:

1. Heteroscedasticity test.

Heteroscedasticity occurs when the error terms variance is unequal throughout the observations. This results to estimates that are biased. This study will test for Heteroscedasticity using Breusch-Pagan Test. Variance of residual should be homoscedastic.

2. Test for Multicollinearity

Multicollinearity exist when explanatory variable is correlated with another explanatory variable. Its existence results to estimates that are unreliable. This study will use Variance Inflation Factor (VIF) to test for the presence of multicollinearity.

CHAPTER FOUR: EMPIRICAL FINDINGS AND DISCUSSIONS

4.1 Introduction

This chapter presents the empirical analysis, which includes the descriptive statistics, correlation analysis, heteroscedasticity test as well as the regression results.

4.2 Descriptive statistics

Table 4.1 below, shows the summary statistics. Although the interviewed individuals aged 16 years and above, this analysis was based on individuals aged 18 years and above which is the definition of an adult in Kenya. Of which, 41.81 percent were male whereas 58.19 were females. The household average age was 40 years, while the average household size is 4 people.

We observe that 17.66 percent were financially healthy. 15.52 percent had no education, 43.91 percent had attained primary education, while 28.19 percent had attained secondary education and 12.36 percent had attained tertiary education.

We observed that 28.11 percent carried out agriculture, 11.82 percent were employed, 24.34 percent were casual laborers, 17.23 percent owned businesses, whereas 18.47 percent are dependent.

The proportion of 0.09 percent, 12.92 percent, 18.10 percent, 28.65 percent, 20.27 percent, 9.35 percent, 3.63 percent, 0.90 percent, 0.12 percent, 5.1 percent, represents income groups earning per month Ksh 0-100, Ksh 101-1,500, Ksh 1501-3,000, Ksh 3,001-7,500, Ksh 7,501-15,000, Ksh

15,001- 30,000, Ksh 30,001- 70,000, Ksh 70,001- 200,000, Ksh 200,001- 400,000 as well as income groups earning more than Ksh 400,000 per month respectively.

Table 4. 1: Summary Statistics

Variable	Observations	Mean	Std.Dev.	Min	Max
Household Size	7,931	3.921574	2.303657	1	21
Age	7,931	40.33703	16.57953	18	95
Marital	7,931	0.583532	0.494939	0	1
Age squared	7,931	1901.922	1599.669	324	9025
gender	7,931	0.4181062	0.4932789	0	1
Financially Healthy	7,931	0.1766486	0.3813951	0	1
Education					
No Education	7,931	0.1552137	0.3621311	0	1
Primary	7,931	0.4391628	0.4963163	0	1
Secondary	7,931	0.2819317	0.4499686	0	1
Tertiary	7,931	0.1236918	0.3292504	0	1
Livelihood					
Agric	7,931	0.2811751	0.4496011	0	1
Employed	7,931	0.1182701	0.322948	0	1

Casual	7,931	0.243475	0.4292064	0	1
Own business	7,931	0.1723616	0.3777183	0	1
Dependent	7,931	0.1847182	0.3880933	0	1
Income Groups					
Ksh_0_100	7,931	0.0090783	0.0948526	0	1
Ksh_101_1500	7,931	0.1292397	0.3354862	0	1
KSh 1501 - 3000	7,931	0.1810617	0.3850935	0	1
KSh 3001 - 7500	7,931	0.2865969	0.4522001	0	1
KSh 7501-15000	7,931	0.2027487	0.4020722	0	1
KSh 15001 - 30000	7,931	0.0935569	0.2912297	0	1
KSh 30001 - 70000	7,931	0.0363132	0.1870801	0	1
KSh 70001 - 200000	7,931	0.0090783	0.0948526	0	1
KSh 200001 - 400000	7,931	0.0012609	0.0354886	0	1
Greater than 400000	7,931	0.0510654	0.2201451	0	1

Source: Author

4.3 Correlation Analysis

Table 4. 2: Correlation Coefficients

Variab les	Resid ence	Hou seho ld Size	Age	Gen der	M ari tal St atu s	Educ ation	Fin anc ial hea lth	Livel ihoo d	Inc om e gro up	Age squar ed
Reside nce	1.000									
Househ old Size	- 0.199	1.00 0								
Age	- 0.178	- 0.11 9	1.0 00							
Gender	0.024	- 0.02 8	0.0 39	1.0 0						
Marital Status	- 0.050	0.27 1	0.0 08	0.06 4	1.0 00					
Educati on	0.288	- 0.15 8	- 0.3 20	0.13 8	- 0.0 33	1.00 0				
Financi al health	0.171	- 0.13 6	- 0.0 84	0.06 3	0.0 53	0.32 4	1.0 00			
Livelih ood	0.211	- 0.05 2	- 0.1 29	- 0.10 6	- 0.1 34	0.07 0	- 0.0 20	1.00 0		
Income group	0.213	- 0.09 0	- 0.0 24	0.12 3	0.0 94	0.24 5	0.2 76	- 0.04 1	1.0 00	
Age square d	- 0.175	- 0.13 9	0.9 81	0.02 7	- 0.0 49	- 0.32 4	- 0.0 92	- 0.07 8	- 0.0 46	1.000

Source: Author

To measure an existing relationship among independent variables, in terms of both magnitude and direction, this study employed a correlation matrix. The table 4.2 above shows no high correlation that might invalidate the estimates of the study, as most of the correlation matrix coefficients are not more than | 0.5|. This rules out the multicollinearity problem in the model. Moreover, there is only high correlation between age squared and age which captures the age's non-linear effect.

4.4 Heteroscedasticity Test

So as to ascertain the regression results validity, the study tested for heteroscedasticity which occurs when the variances of the residuals are not constant across the observations. When the error terms variances are heteroscedastic, the estimated coefficients becomes highly inflated which misleads and makes it hard to draw conclusions that are meaningful. This study employed Breusch-Pagan test to check for the presence of heteroscedasticity as presented in table 4.3 below.

The Probability χ^2 is greater than the 5 percent conventional level of significance thus, we failed to reject the null hypothesis of the constant variance. Hence, heteroscedasticity in this study was not a concern.

Table 4.3 Breusch-Pagan test for heteroscedasticity

Calculated χ^2	0.01
Prob> χ^2	0.9021

H_0 : Constant Variance

4.5 Estimation Results

In this part, the study presents the estimated results in order to address the objective from the multinomial probit model. The interpretation of the changes in the saving probabilities is explained using the marginal effects as it is easy to compute as well as interpret.

Table 4. 4: Marginal Effects for Multinomial Probit Model

Variables	Formal Savings	Informal Savings
Residence	0.28225***	-0.0134663***
Urban	(9844.27)	(0.01)
Household Size	-0.193195***	-0.0104851***
	(3271.78)	(0.00)
Age	0.77542***	0.019232***
	(3887.07)	(0.00)
Gender	0.177182**	-0.1978423***
Male	(24422.13)	(0.01)
Education		
Primary	0.2627848***	0.1768428***
	(80359.13)	(0.01)
Secondary	0.304116***	0.1828493***
	(90646.74)	(0.02)
Tertiary	0.3658785***	0.1568024***
	(141999.10)	(0.02)
Financially Healthy	0.1953781***	0.1060583***
Yes	(27096.50)	(0.01)
Livelihood		
Employed	0.1158227***	0.02
	(35512.45)	(0.02)
Casual	-0.0039253***	0.00
	(8194.97)	(0.01)
Own Business	0.0900992***	0.0836751***

	(43193.21)	(0.02)
Dependent	-0.0463889***	-0.0297282*
	(20995.62)	(0.02)
Income Groups		
KSh 101 - 1500	0.08	0.0730071*
	(0.06)	(0.04)
KSh 1501 - 3000	0.193018***	0.1294894***
	(0.06)	(0.04)
KSh 3001 - 7500	0.2330223***	0.1587118***
	(0.06)	(0.04)
KSh 7501-15000	0.3272492***	0.1547856***
	(0.06)	(0.04)
KSh 15001 - 30000	0.3534918***	0.1578699***
	(0.06)	(0.05)
KSh 30001 - 70000	0.4052056***	0.2013825***
	(0.07)	(0.05)
KSh 70001 - 200000	0.5466277***	0.1980965**
	(0.09)	(0.07)
KSh 200001 - 400000	0.7008744***	0.19
	(0.76)	(0.15)
Greater than 400000	0.153263***	0.1672904***
	(0.07)	0.05
Marital Status	0.0132105***	0.0226686**
Married	(5054.38)	(0.00)
Age squared	-0.0000932***	-0.0001803***
	(19.08)	(0.00)

Waldi $\chi^2(30) = 4214.8$

Prob $>\chi^2 = 0.0000$

Log pseudo likelihood = -7148.8174

Number of observations = 7931

*Notes: * $p < 0.1$, ** < 0.05 , *** < 0.01 level of significance*

Standard errors are in parenthesis

Source: Author

Table 4.4 above presents the marginal effects of the multinomial probit model with formal and informal savings being the dependent variables. The number of observations is 7931. The log Pseudo Likelihood test has the value -7148.8174 whose χ^2 is associated with P value of 0.0000 which means that the model is valid.

The estimated formal savings models shows that all the coefficients are statistically significant except the coefficient for income group earning Ksh 101-1500. While Age squared, household size, casual labour and dependent population indicated an inverse relationship to formal savings. The findings are consistent with the theory and findings from past empirical studies. For the informal savings, all coefficients are statistically significant apart from the coefficient for employed and casual workers. Based on the marginal effects report, the financial service providers have great opportunity to design savings products while targeting a specific target population.

Age variable is significant towards influencing both formal and informal savings in Kenya. Hence this explains the positive coefficient for age, as well as the negative coefficient for the age squared variable which symbolizes the presence of a quadratic relationship between age and both the formal and informal savings. A one year increase in a person's age from the mean increases formal and informal savings by 77.54 and 1.92 percent respectively with the marginal changes turning negatively with age advancement. This confirms the related findings by Kibet et al., (2009) as well as by Amimo et al., (2004).

This study found marginal propensity to save formally and informally rising with income although diminishing marginal returns are observed at higher income levels above KSh 400,000 for formal savings and above Ksh 200,000 for the informal savings. Households earning between Ksh 1,501-3,000 per month have a 19.3 percent and 12.9 percent higher probability of formal and informal

saving respectively compared to those earning 101-1500 per month. A similar trend is observed for other income groups earning between Ksh 3,001-7,500, Ksh 7,501-15,000, Ksh 15,001-30,000, Ksh 30,001- 70,000, Ksh 70,001- 200,000, Ksh 200,001- 400,000, Ksh Greater than 400,000 were found to have 22.3 percent, 32.74 percent, 35.35 percent, 40.52 percent, 54.66 percent, 70.08 percent, 15.32 percent higher probability of saving formally respectively and 15.87 percent, 15.48 percent, 15.78 percent, 20.13 percent, 19.8 percent, 19.0 percent, 16.72 percent higher probability of saving informally respectively. Both savings and consumption theories predict a strong positive relationship between income and households savings. This hypothesis has been empirically confirmed by Kibet et al. (2009); Amimo et al. (2004) among others.

The marginal effects for household size, measured by the household's total number of people indicated that an increase in the family size by one person from the mean reduces the savings potential for both formal and informal savings by 19.31 and 1.04 percent respectively. A similar study on savings in Mozambique showed an inverse relationship between household savings and household size, Amimo et al. (2004). This explains why smaller families are preferred today by most people due to resource constrain as a result of competing interests. An additional family member beyond the mean which is four, it leads to an increase in expenditure which results to a decrease in the disposable income. Due to an inverse relationship between savings and reduction in income, household size increase reduces the probability of saving from formal institutions and as well as a substitution of the same on informal savings.

Educated households in this study exhibited a higher probability of saving formally as compared to informally. Tertiary education holders accounted for the highest formal savings probability increase as compared to those having no education. This is evidenced by the 26.28, 30.41 and 36.59 percent higher probability of primary, secondary and tertiary education holders saving formally respectively. Compared to the 17.68, 18.28 and 15.68 percent higher probability of primary, secondary and tertiary education holders saving informally respectively. Kibet et al., (2009) associated education of the household head to improved saving behaviour. This is consistent with this prediction. The results indicate that educating the public boosts significantly access to formal savings. Education is also associated with an increase in the awareness on access to financial services, (Kiiza & Pederson 2001). However, in a study by Amimo et al. (2004) in

Mozambique, established a negative relationship between higher education levels and households savings as they tend to search for white collar jobs which turns out to have lower incomes.

By one's main economic activity, livelihood variable compares the probability of saving both formally and informally with reference category being agriculture. Employed persons have 11.58 percent higher probability of saving formally compared to those in agriculture sector. Though employment is not a major consideration in savings going by the informal savings position, employed persons have a 2 percent higher probability of saving informally compared to those in agriculture sector. In Kenya, business owners have a 9.01 percent and 8.37 percent higher probability of saving both formally and informally respectively compared to those in agriculture. The dependent population reported a 4.63 percent and 2.97 percent lower probability of saving both formally and informally respectively compared to those working in agriculture sector, this category consists of elderly, and students who rely for their daily subsistence on family, friends and government transfers. An additional dependent raises the expenditure in the household thus lowering savings. Casual workers have also a 0.39 percent lower probability of saving formally. The findings are consistent with Amimo et al., (2004) study in Mozambique as well as Njenga et al., (2018) study in Kenya.

One's gender is also a key consideration in savings. Males reported 17.71 percent higher probability of saving formally as compared to females. Whereas Males reported 19.84 percent lower probability of saving informally compared to their female counterparts. Kibet et al., (2009), established a strong link between the household savings and the gender of the household head in Kenya.

Moreover, the study also sought to establish the role played by one's marital status on both formal and informal savings. The study found that married persons have a 1.32 percent and 2.26 percent higher probability of saving formally and informally respectively as compared to the others. When two mature adults come together in a marriage union, pulling together of the accumulated resources could raise their total wealth. The marital status positive and significant relationship impact on household savings conforms to the consumption and savings theories as well as Chowa et al., (2012) and Njenga et al., (2018).

The estimated model in this study found that urban residents enjoy 28.22 percent higher probability of saving formally compared to their rural counterparts. Whereas urban residents also reported 1.34 percent lower probability of saving informally. Kiiza & Pederson (2001) and Atieno (2001)

predicted a strong relationship between formal savings and urban residents. Which could be partly because formal savings is predominant in urban areas.

The study also sought to establish the relationship between savings and financial health in Kenya. Whereby according to FinAccess, (2019), a household's financial health is measured by assessing their ability of using financial services in order to manage their day to day needs, mitigate potentially catastrophic shocks and achieve their goals. Several selected variables which include ability to raise money for emergencies, gone without food, saving for old age, putting money aside for future use among others were used to construct a financial health index. This study found that financially healthy persons have a 19.54 percent and 10.60 percent higher probability of saving formally and informally respectively compared to the non-financially healthy population. Thus an improvement in the overall financial wellbeing is a key driver of the household saving behaviour.

CHAPTER FIVE: SUMMARY, CONCLUSION AND POLICY RECOMMENDATIONS

5.1 Introduction

This chapter focuses particularly on the summary of findings, conclusion, policy recommendations as well as areas for further studies.

5.2 Summary and Conclusion of the Findings

The study examined the determinants of household savings decision in Kenya using the 2019 Kenya National Household Finance Access data set. This study aimed to analyze the determinants of household savings choice options, formal or informal savings. From this study they include age, marital status, income, education, gender, livelihood, financial health, residence as well as sex.

Public exposure to formal education and promoting financial literacy programs which is a combination of knowledge, awareness, attitude, skill as well as the behavior is necessary so as to make sound financial decisions. This could help in creating awareness regarding the usefulness of the different financial services including savings as well as the effective management towards

enhancing optimal utilization. Moreover, households that are financial healthy have more ability to use the financial service. Choice of saving product for both formal and informal by a household is highly motivated by the demographic characteristics.

Age of household head was found as a boost to both formal and informal savings probability up to a certain point where it starts to decline with age advancement. On sex, male tends to have a 17.71 percent higher probability of saving formally relative to females whereas, they have a 19.78 percent lower probability of saving informally compared to female. Moreover, formal and informal savings were found to rise with income. With urbanization, there was a rise in formal savings and a lower probability of saving informally. Furthermore, both formal and informal savings rises with marital status, financial health and those who own businesses. This also applies for employment in formal savings. Household size and dependent persons have an inverse relationship towards both formal and informal savings. Financial healthy was found to be key towards both formal and informal savings as an improvement in the wellbeing of a household improves its ability to invest in livelihoods, management of day to day needs as well as coping up with risks.

5.3 Policy Implication

Experts believe that an increase in access to saving products would result to an improvement in the spurring of investments and hence economic growth. This study recommends a campaign that will led to promotion of saving in formal channels, as well as female empowerment to encourage female to save given the current savings rates in Kenya through women empowerment organizations.

The government should support implementation of financial health, financial literacy and education programs that results to an increase in the savings products uptake as well as effectiveness. This can be through friendly education systems by lowering the entry costs as well as improvement of education quality offered by the learning institutions.

Family based organization as well as religious institutions should encourage marriage as youth and married people are more likely to save more compared to others.

The government should create a conducive environment for businesses to thrive. The government should also implement policies that results to improvement of productivity and incomes through development projects that support economic activities such as marketing channels, water,

electricity, transport and communication infrastructure. Moreover, creating more employment opportunities to improve the income is key, given the critical role that income plays towards raising access to financial services.

5.4 Area for Further Research

This study can be extended by analyzing specific regions or counties since the analysis was carried out in the 47 counties using FinAccess 2019.

The study also recommends more analysis and studies on savings in the secret hiding places to understand it deeper.

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