

**The KENYA INSTITUTE for PUBLIC  
POLICY RESEARCH and ANALYSIS**

# Enhancing Household Savings Behaviour through Mobile Money Fintech Innovation

Valentine Michuki

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**THE KENYA INSTITUTE FOR PUBLIC POLICY  
RESEARCH AND ANALYSIS (KIPPRA)**

**YOUNG PROFESSIONALS (YPS) TRAINING  
PROGRAMME**

**Enhancing Household Savings  
Behaviour through Mobile Money  
Fintech Innovation**

*Valentine Michuki*

*Kenya Institute for Public Policy  
Research and Analysis*

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Bishops Garden Towers, Bishops Road

PO Box 56445-00200 Nairobi, Kenya

tel: +254 20 2719933/4; fax: +254 20 2719951

email: [admin@kippra.or.ke](mailto:admin@kippra.or.ke)

website: <http://www.kippra.org>

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## **Abstract**

*Savings are important for households and the sustainability of the economy. They reflect on the ability of a household to cope with cyclical incomes. This study analyses the factors that determine mobile money savings by households across the country in an effort to come up with strategies to enhance the same. The study used data from the Kenya National Financial Access Household Survey (2021) in the analysis. The findings of show that mobile money savings increase with age, individual financial goals, perception of financial information safety and confidentiality, and urbanization. Mobile money savings were higher in urban areas relative to rural areas. Financial literacy and access to relevant information and knowledge play a critical role in enhancing mobile money savings behaviour among households and individuals. Based on the results, most of those who save through mobile money are youths and adults in their prime working age, 36 years to 60 years, at 44 per cent and 34 per cent, respectively; and those earning an income of less than Ksh 25,000 per month. Further, a significant proportion of women are not saving using mobile money. The study recommends the promotion of financial literacy education programmes to the youth and the women to empower them to save. Also, there is need to empower the youth by creating more employment opportunities across board to have a source of income to save. Furthermore, enhancing a conducive and safe environment for mobile money saving, innovations to make the mobile money platforms competitive, and having support infrastructure including access to reliable internet and source of power can play a critical role in enhancing household savings. Mobile money savings can be incentivized with interest payments.*

## **Definition of Terms**

**Saving** is the portion of income not spent on current expenditures. It is what is left after subtracting consumer spending from disposable income. It is money set aside for future use and not spent immediately. Savings are calculated by subtracting consumer expenditures from the disposable income of households.

**Consumer expenditure** includes expenditures on goods and services. Disposable incomes of households consist of income from employment, business, casual work, farming, and income in the form of interest, dividends, and social benefits.

**Mobile Money** is an electronic wallet service where funds are stored in a secure electronic account linked to a mobile phone number. It allows mobile users to deposit, withdraw, transfer money, pay for goods and services, and to access credit and savings. It also keeps a record of every transaction and account balance.

**Household** is the basic unit of analysis comprising occupants of a home with a common budget and decision-making.

**Financial technology** is a new technology that improves and automates the delivery and use of financial services.

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## 1. Introduction

Mobile money innovation has been a major revolution in the financial sector in Kenya. It is a key enabler of financial inclusion both as a driver of account ownership and of account usage through mobile payments, savings, and borrowing. The 2021 FinAccess Household Survey indicates that Kenya's fintech revolution has helped the country achieve near total financial inclusion, with 83.7 per cent of the adult population having access to at least one financial product as of 2021. Financial technology has also increased access to multiple types of service providers, with a combination of both formal and informal financial services and products, with mobile money recording the highest proportion of usage at 81.4 per cent followed by mobile banking at 34.4 per cent and traditional banking at 23.8 per cent. The paper assesses the impact of mobile money usage on the savings function of Kenyan households.

Mobile money financial technology (Fintech) innovations enhance money circulation, access to capital, savings, and credit, thus enhancing the productivity of the key factors of growth and production - land, labour, capital, and entrepreneurship, while stimulating greater investment, spurred consumption, spending and growth of business. Financial inclusion brought about by Fintech enhances the realization of some of the Sustainable Development Goals (SDGs), which include eradicating poverty; ending hunger; reducing inequality; achieving food security and promoting sustainable agriculture; enhancing health and well-being; and achieving gender equality and economic empowerment of women. The 2021 Finaccess survey indicates that such fintech innovations have led to reduced disparities in access to financial services by gender, which has narrowed over time from 8.5 per cent in 2016 to 4.2 per cent in 2021, thus enabling women to participate more meaningfully in productive economic activities. Those without formal education, and those in the lowest wealth quintile, are able to enjoy the dividends of financial technology such as mobile money. The COVID-19 pandemic further accelerated the adoption of digital financial services, with more adults making digital merchant payments using digital cards, phones, or the Internet, and paying utility bills directly from bank accounts.

Mobile money fintech has also evolved to become a useful tool to improve governance by promoting social programmes through applications that channel cash transfers directly to beneficiaries' mobile phones, thereby reducing money leakage and delays. This increases transparency and reduces corruption as money flows can easily be tracked from government agencies to people. It has further increased platforms for access to extra funds and credit by on-boarding various money lending apps that offer credit across various durations, if one encounters an unexpected expense. Receiving digital and mobile money payments such as



a payment, a government transfer, or a domestic remittance further catalyses the use of other financial services for savings and borrowing money among the masses.

With mobile money, there is also increased frequency in its usage on a daily and weekly basis due to increased liquidity needs of households and increased convenience to transact. Mobile money has also been useful in enhancing the savings of households, being resilient to financial shocks and better able to meet financial goals, relieving them of financial stress.

With increased access to Internet, mobile money is readily available, convenient, and the most proxy platform for any individual with a phone to effect payments and access credit and savings facilities. Albeit the initial purpose of mobile money being for payments and money transfer services, in Kenya, this has steadily revolutionized to incorporate credit and savings functions. However, it has not been fully used as a means of savings. Kenya experienced a low increase in savings rate from 69.9 per cent in 2019 to 74 per cent in 2021, compared to the credit rate of 50.4 per cent to 60.8 per cent within the same duration. This can be attributed to an increase in the percentage of the population who after meeting their daily needs, have little left to save and invest in future goals. The survey further indicates that the percentage of the population experiencing a shock nearly doubled during this time. According to the 2021 Finaccess report, the main shocks experienced were increased cost of living (83%) followed by health (32%) and loss of income (23%). There is therefore increased need to enhance savings by households so that they can cushion themselves against increasing shocks and meet future financial needs.

The study focuses on how best savings can be enhanced, leveraging on the available mobile money fintech platform, and by identifying the main drivers of savings among households. By analysing the drivers of mobile money savings among households, the study will also establish if there is consistency in the character of those who save via mobile money platforms, and the key purposes and uses of money saved via mobile money. This will enable the stakeholders to enact the appropriate policy strategies to enhance savings by mobile money users and address limitations that emanate from the study, in the use of mobile money savings platforms. Such will ensure that households are sufficiently cushioned from economic pressures and unpredicted demand for finances.

The objective of this study was to identify the determinants of mobile money savings and to establish the key uses/purposes of money saved via mobile money. It extends available research done on the savings function brought about by financial technology by using most recent up-to-date data from the 2021 FinAccess Household Survey to analyse household behaviours with respect to savings via

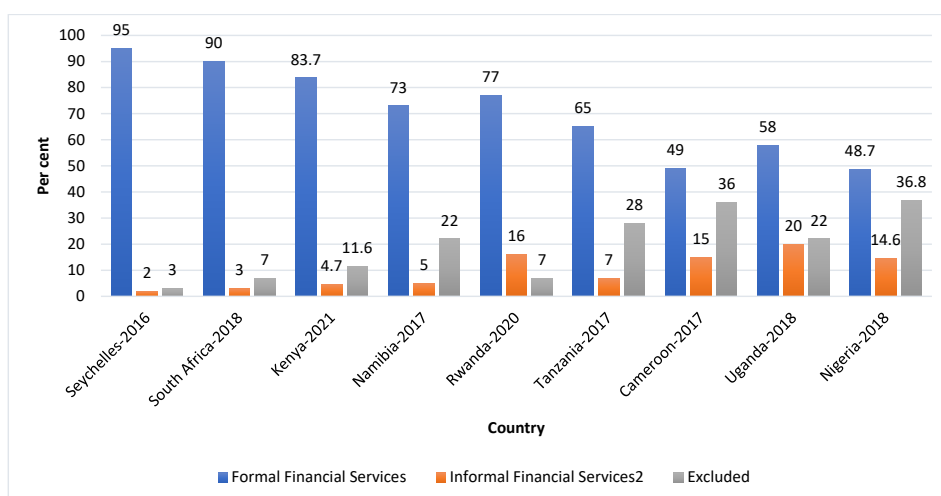
mobile money accounts. The outcomes of this study provide valuable insights into the financing and savings behaviours of households and provide insight into measures that could be implemented to increase mobile money savings. It also enhances theory through the deductions made from the results. The results equally provide additional empirical evidence for Kenya's financial mobile money usage, offer insights for further studies in the area and for policy formulation in setting financing and savings guidelines for the sector. This contributes to ensuring that appropriate and rational decisions are made on enhancing savings culture via mobile money accounts.

The rest of the paper is structured in the following order. Section two presents relevant policy review. Section three presents the literature review, which includes a review of the policy framework, theoretical and empirical literature. Section four presents the methodology, which includes the theoretical and empirical framework, data, and description of variables. Section five focuses on a discussion of the findings, while section six provides the conclusion and policy recommendations.

## 2. Mobile Money Industry and Developments

Financial technology enables companies, business owners, and consumers better manage their financial operations and processes by utilizing specialized software and algorithms that are used on computers and, increasingly, smartphones. The digital transformation in the financial services industry offers a viable digital alternative to traditional banks, which had left significant population underbanked and underfinanced. The 2008 financial crisis created an opportunity for less regulated, technology enabling non-banks to thrive, thus the growth of fintech. Such firms offer financial services more cheaply and efficiently than the incumbents burdened with legacy infrastructure and regulation. Financial technology has tremendously increased financial access in Kenya over time, making Kenya range among the highest in financial access, compared to its African counterparts (FinAccess report, 2021).

**Figure 2.1: Country comparisons of financial Access**

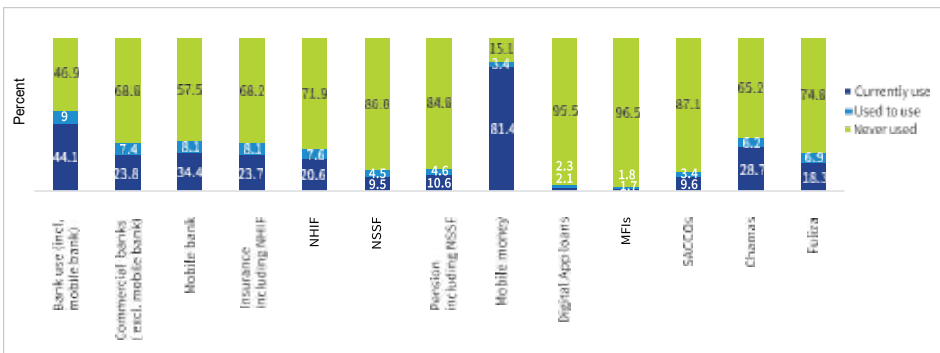


Source: FinAccess national household survey report 2021

Savings are critical for investment growth and capital formation. Some of the key reasons the FinAccess Survey identifies as to why households save include: for investment purposes, for farming activities of crops and livestock, starting a new business, buying personal and household items, buying land, refurbishing/buying a house, expanding businesses, for retirement purposes, education (self, child, sibling), and to address emergencies (burial/medical), among others. Savings are a critical function of capital formation in the economy, and are a major concern to stakeholders, as demands for finance continues to increase due to increase in cost of living, more so in the season of COVID-19 pandemic.

Mobile money, such as M-Pesa, is an important enabler of financial inclusion in Kenya, more so for women and marginalized groups, both for account ownership and account usage through mobile payments, savings, and borrowing. It has evidently reduced the gender gap in financial access to 4.2 per cent in 2021 from 5.2 per cent in 2019, implying rising equality among the two genders. There is also increased frequency in the use of mobile money from 8 percentage points in 2016 to 5.2 percentage points in 2021, due to increased liquidity needs of households and increased convenience of using it to transact and save. Digitalization has therefore become a powerful tool to catalyze the use of other financial services for savings and borrowing money. Figure 2.2 focuses on the popularity of mobile money as of 2021.

**Figure 2.2: Proportion of population with access to various financial products (2021)**



Source: FinAccess National Household Survey Report 2021

The 2021 Finaccess report highlights the steady growth of the savings and credit ratios over time, showing how savings grew by 4 per cent from 2019 to 2021, while in the same duration, credit grew by over 10 per cent. The different saving behaviours of Kenyan households across various service providers are presented in Table 2.1.

**Table 2.1: Household saving options in Kenya (%)**

Platform	Mobile money	Mobile banking	Micro-finance institutions	Group of friends	Chama	Sacco	Bank account	Post-bank Account	Family/Friend to keep	Secret hiding place
<b>Currently use</b>	11,290 51.26%	2,577 11.70%	283 1.28 %	3,343 15.18%	5,522 25.07%	1,992 9.04 %	643 2.92%	205 0.93%	707 3.21%	5,533 25.12%
<b>Used to use</b>	1,992 9.04%	1,984 9.01%	320 1.45%	2,584 11.73%	1,268 5.76%	557 2.53%	225 1.02%	208 0.94%	386 1.75%	1,572 7.14%
<b>Never used</b>	8,741 39.69 %	17,462 79.29%	21,421 97.26%	16,093 73.08%	15,231 69.16%	19,473 88.42%	21,151 96.05%	21,606 98.12 %	20,928 95.02%	14,916 67.73%
<b>Missing</b>	1 0.00%	1 0.00%	-	1 0.00%	3 0.01%	2 0.01%	1 0.00%	1 0.00%	3 0.01%	3 0.01 %
<b>Total</b>	22,024	22,024	22,024	22,024	22,024	22,024	22,024	22,024	22,024	22,024

*Source: 2021 Finaccess Survey*

The data shows that mobile money is the most used by households to save and put money away by 51.26 per cent, followed by those who keep their money in secret places at 25.12 per cent and those who save through *Chamas* at 25.07 per cent. The impact of household savings on financial inclusion brought about by FinTech remains uncertain, especially in developing countries such as Kenya; yet enhancement of the savings function has the potential to enhance growth of financial inclusion in the present digital revolution era. There is also limited literature in the area, especially for the pre-COVID-19 pandemic era. This paper bridges the existing time gap of literature present in the field, as it seeks to study what will best drive savings in the present economic time of heightened cost of living.

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### **3. Literature Review**

This chapter discusses relevant theories on mobile money use and savings practices and presents a summary of the empirical findings of studies done in the area. Finally, it highlights an overview of the literature and gaps identified from the studies reviewed.

#### **3.1 Theoretical Literature**

Household savings behaviour and choices are determined by various factors. This section analyses the theoretical framework of those factors. In the saving theories, both consumption and saving are considered together, since a household's consumption decision affects its savings decision as the amount saved is what is left from the amount consumed. It is assumed that rational households try to maximize utility and minimize expenditure and that they can choose between assets and income available to finance consumption. A household preference is therefore influenced by their present and future consumption choices. This section covers theories relating to savings and technology uptake.

##### **3.1.1 The life-cycle hypothesis (Modigliani and Brumberg, 1954)**

The theory has been widely used to study the savings and retirement behaviour of individuals by presenting a well-defined linkage between the consumption plans of the individual and his income and income expectations as he passes from childhood, through the work participating years, into retirement and eventual decease (Ro depeter and Winter, 1999).

The theory, therefore, assumes that individuals plan their consumption and savings behaviour by considering all the different ages of their lives and spreading their income in such a way that todays income will be used to finance tomorrow's consumption (Modigliani and Brumberg, 1954). This implies that individuals usually do not save up a lot in one period to spend in the next period, but keep their consumption levels approximately the same in every period of their entire lives. Therefore, the key motive to save is to take care of expenses (consumption) after retirement and to acquire wealth.

It observes that consumption needs and income are often unequal at various points in the life cycle. Younger people tend to have consumption needs that exceed their income. Their needs tend to be mainly for housing and education, and therefore they have little savings. In middle age, earnings generally rise, enabling debts accumulated earlier in life to be paid off and savings to be accumulated.

Finally, in retirement, incomes decline and individuals consume out of previously accumulated savings. The age profile of the household plays an important role in savings behaviour (Gedela, 2012), informing the need to control for age structure to factor in any fluctuations in savings behaviour. Age will be decomposed into three structures: 18-35 years; 36-60 years; 61-80 years and 81-120 years.

Both permanent and life cycle hypothesis assume that households can perfectly visualize their future levels of consumption, income flows, their life span and more so behaves rationally, self-controlled preparing for retirement.

### **3.1.2 The permanent income hypothesis (PIH) (Friedman, 1957)**

This is a consumer spending theory stating that people will spend money at a level consistent with their expected long-term average income, thought of as “permanent” income that can be safely spent. Permanent income may be regarded as ‘the mean income’, determined by the expected or anticipated income to be received over a long period of time. Friedman (1957) proposed PIH, whereby it makes use of current consumption to determine lifetime or permanent disposable income. According to Friedman, current income, because of lag effects, could not clarify the current decisions of a household, thus it was essential to find a better income measure. Permanent income was taken as an average of all incomes that a household expects in the long-run by estimating the expected incomes from capital and labour. PIH is based on the assumption that the household objective is to maintain a smooth or stable consumption path through equal allocation of lifetime resources in each life period.

Household consumption in every period corresponds with the permanent income taken as the annual sum of total assets that the household owns and future expected income that is discounted. This income gives similar present value of a household’s lifetime resources as that inferred by its inter-temporal budget constraint. Transitory income can either be negative or positive, and that differentiates present from current permanent income value. Savings are 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 hypothesis relates the consumption of a household to its expected long-term average income. The level of the expected long-term income is thought of as the household’s level of “permanent” income that can be safely spent. A household will therefore save only if its current income is higher than the anticipated level of permanent income to guard against future declines in income. This assumes that households are able to determine what their long-term consumption needs are and

then apportion their resources accordingly to cover their life span (Carroll, 2001; Meghir, 2002).

The hypothesis draws a distinction between two components of income – permanent and transitory incomes as determinants of household savings, and indicates that savings are influenced by both components and the present level of wealth (both human and non-human) of a household. Permanent income is defined in terms of the long time income expectation over a planning period and a steady rate of consumption maintained over a lifetime given the present level of wealth (Muradoglu and Taskin, 1996).

### **3.1.3 Keynes Theory of Demand for Money (John Maynard Keynes, 1936)**

Keynes observes that demand for money is a function of two variables, namely income ( $Y$ ) and the rate of interest ( $r$ ). Keynes posits that money was demanded due to three main motives: the transactions motive, the precautionary motive, and the speculative motive. The implication is that money yields its holders' conveniences of non-pecuniary nature. This yield is rooted in the peculiar characteristic of money as the only generally acceptable means of payment, and therefore it is perfect liquidity.

According to Keynes' view, the total demand for money can be represented by  $M_d$  and money held for transactions and precautionary motive as  $M_1$  and for speculative motive as  $M_2$ . Thus  $M_d = M_1 + M_2$ . According to Keynes, the money held under the transactions and precautionary motives,  $M_1$ , is completely interest-inelastic unless the interest rate is very high.

The  $M_1$ , for transactions and precautionary motives, is mainly a function of the size of income and business transactions together with the contingencies from the conduct of personal and business affairs. Its functional form will be:

$$M_1 = L_1(Y) \tag{1}$$

Where  $Y$  stands for income,  $L_1$  for demand function, and  $M_1$  for money demanded or held under the transactions and precautionary motives, implying that money held under the transactions and precautionary motives is a function of income.

Money demanded speculative motive,  $M_2$ , is primarily a function of the rate of interest. This can be written as:

$$M_2 = L_2(r) \tag{2}$$



Where  $r$  stands for the rate of interest,  $L_2$  for the demand function for a speculative motive.

Since the total demand of money  $M_d = M_1 + M_2$ , from equations (1) and (2) above, we get:

$$M_d = L_1(Y) + L_2(r) \quad (3)$$

Thus, according to Keynes' theory of total demand for money is an additive demand function with two separate components. The one component,  $L_1(Y)$  represents the transactions demand for money arising out of transactions and precautionary motives and is an increasing function of the level of money income. The second component of the demand for money, that is  $L_2(r)$ , represents the speculative demand for money, which depends upon the rate of interest, is a decreasing function of the rate of interest.

### **3.1.4 Friedman's Theory of Demand for Money**

Friedman treats money as an asset in which wealth holders can keep a part of their wealth. According to Friedman, individuals hold money for the services it provides to them. He observes that money serves as a general purchasing power so that it can be conveniently used for buying goods and services. Friedman considers the demand for money merely as an application of a general theory of demand for capital assets. Like other capital assets, money also yields returns and provides services. He analyses the various factors that determine the demand for money and, from this analysis, derives demand for money function, with the value of goods and services which money can buy representing the real yield on money. This real yield of money in terms of goods and services it can purchase will depend on the price level of goods and services.

Friedman also considers an explicit yield from commodities in the form of the expected rate of change in their price per unit of time. Friedman's nominal demand function ( $M_d$ ) for money can be expressed as:

$$M_d = f(W, h, m, r_m, r_b, r_e, P, \Delta P/P, U) \quad (4)$$

Demand for real money balances is nominal demand for money divided by the price level and expressed as:

$$M_d/P = f(W, h, r_m, r_b, r_e, P, \Delta P/P, U) \quad (5)$$

where  $M_d$  stands for nominal demand for money and  $M_d/P$  for demand for real money balances,  $W$  stands for wealth of the individuals,  $h$  for the proportion of human wealth to the total wealth held by the individuals,  $r_m$  for rate of return or interest on money,  $r_b$  for rate of interest on bonds,  $r_e$  for rate of return on equities,  $P$  for the price level,  $\Delta P/P$  for the change in price level (i.e. rate of inflation), and  $U$  for the institutional factors.

Due to the non-existence of reliable data about the value of wealth ( $W$ ), thus difficulty in estimating the demand for money. To overcome this difficulty, Friedman suggested that since the present value of wealth or  $W = Y_p/r$  (where  $Y_p$  is the permanent income and  $r$  is the rate of interest on money). Permanent income  $Y_p$  can be used as a proxy variable for wealth.

Incorporating this in Friedman's demand for money function we get:

$$M_d = (Y_p, h, r_m, r_b, r_e, P, \Delta P/P, U) \quad (6)$$

If we assume that no price change is anticipated and institutional factors remain fixed in the short-run and all the three rates of interest return are clubbed into one, Friedman's demand for money function is simplified to:

$$M_d = f(Y_p r) \quad (7)$$

### 3.1.5 Technological Acceptance Theory- TAM (Fred Davis, 1989)

The theory models how users come to accept and use technology. It observes that behavioural intention is a factor that leads people to use technology. Behavioural intention (BI) is influenced by attitude, which is the general impression of the technology. The model suggests that when users are presented with a new technology, several factors influence their decision about how and when they will use it, notably:

- i) Perceived usefulness (PU) – This is whether someone perceives that technology to be useful for what they intend to do with it.
- ii) Perceived ease-of-use (PEOU) – Davis defined this as “the degree to which a person believes that using a particular system would be free from effort” (Davis, 1989). This means that the technology is easy to use.
- iii) External variables- This may include social influence, an important factor that determines the user's attitude.

The theory notes that one's perception may also change depending on age and gender, since every individual is uniquely different.

### **3.1.6 Task-technology Fit (TTF) theory**

It emphasizes the individual impact of the innovation. Individual impact refers to improved efficiency, effectiveness, and/or higher quality results. Goodhue et al. (1995) assumed that the good fit between task and technology is to increase the likelihood of utilization and increase the performance impact, since the technology meets the task needs and wants of users more closely. The model is suitable for investigating the usage impact of the technology, especially testing of new technology to get feedback. The task-technology fit is a good measure for the technology applications already released in the marketplace, such as mobile money. The study concept is founded on consumer choice, based on three economic models that assume that individuals/households would attempt to maximize their utility or personal well-being by balancing a lifetime stream of earnings with a lifetime pattern of consumption.

## **3.2 Empirical Literature**

Various studies have been carried out in the thematic areas of the paper, with mixed results on the determinants of savings. Some of the determinants discussed by the studies include perception, income, demographics of households, including gender and area of dwelling, financial goal of household, desired uses of savings and incentives available to save.

The level of income is important in determining the usage of mobile money. Kennedy and John (2018) studied the effect of mobile money on savings and money transfer practices for low-income earners in Kenya and arrived at the results that the poor receive remittances from relatives, with many unbanked populations saving on the phone, as mobile money appears to have been associated with a significant shift from the practice of saving money by hiding it in houses. Sameoroyning's (2005) study on savings behaviour among households in Russia notes that the marginal propensity to save out of income is positive with increased income.

Perception of Fintech is seen to affect the level of savings by households. FSDKenya (2013) in their study on financial inclusion in Kenya observes that Kenyans do not trust informal modes of savings and that mobile banking has improved the trust lacking in informal savings. Demombynes (2012) on Kenya's mobile revolution and the promise of mobile savings, observes that mobile technology has enhanced

savings to informal groups and that group savings on the phone eliminates the risk of a group member leaving easily.

On the impact of households' demographics on saving, Tchouassi (2012) in determining whether mobile phones really works to extend banking services to the unbanked in Sub-Saharan Africa notes that the poor, vulnerable and low-income households lack access to banks, while mobile phone presents an opportunity for provision of financial services to the unbanked. Haas, Plyer and Nagarajan (2010) and Macharia and Okunoye (2013) observe that mobile money provides a safer savings alternative. The practice of saving money in non-monetary forms such as animals and grains, however, appears not to have been affected by the introduction of mobile money in rural areas where it is normally practiced. This is a practice that is deep among pastoralists who store their wealth in animals. The introduction of mobile money appears to have been associated with an increase in the number of low-income earners saving their money with formal banks and SACCOs. This suggests that mobile money is associated with an improvement in financial inclusion to hitherto financially excluded low-income earners. The Mbiti and Weil (2014) and Mothiora (2015) studies on the impact of M-Pesa in Kenya arrived at similar findings.

On the various uses of saved money, Morawczynski (2009) documents that mobile money acts as a complement to other savings mechanisms. Some people use their mobile money account to separate their business savings from their personal savings. Others withdraw their money from the bank account to save it into their mobile money account or just use it to accumulate money and remit it to relatives when they reach the target amounts. These findings appear to reflect that mobile money affects the savings behaviour of users through a breakdown of savings amounts. In this context, mobile money would not affect the behaviour of individuals to save more, than keeping the overall level of savings unchanged. Demombynes and Thegeya (2012) established that M-Pesa usage increases savings as a simple storage device. They argue that while it does not pay interest, mobile money is considered a device to store funds safe from the dangers of theft and inaccessible to relatives. Therefore, it can be relevant to highlight the impact of mobile money usage on individual savings behaviour and in some manner on savings patterns, such as unpredictable and predictable objectives.

On households' perception to save and the impact of incentivizing savings, Nandhi (2012) studied the effects of mobile banking on the savings practices of low-income users in India. Several findings emerged from the field survey; firstly, the ability to save has improved for most users through mobile banking by comparison to earlier practices such as keeping cash on hand. These informal savings are often susceptible to unnecessary and trivial expenditures. Secondly, mobile banking has

become a very effective, safe, and trustworthy savings instrument for its users; importantly, dependence on risky informal methods has decreased for a large percentage of customers who were previously dependent on these practices for lack of affordable and safe savings options. Thirdly, mobile banking is perceived as a good substitute for traditional banking and informal forms of savings. However, it has not dispelled the need for existing savings mechanisms and, lastly, mobile banking is used in conjunction with or as complementary to an existing savings practice. Olga's (2009) findings suggested that M-Pesa can have a much greater role in the mobilization of savings, rather than just being a mechanism in the financial portfolio. It can provide a platform on which various savings mechanisms can be accessed. A study by FSD Kenya (2011), financial inclusion in Kenya, found that 40 per cent of Kenyans surveyed do not join savings groups because they either do not know or do not trust their neighbours. By using mobile money, trusted companions and family members may be included in savings groups, regardless of location. For example, an extended network of friends and family across different villages can start their own savings group, even though they live apart. The traditional informal savings group model requires regular and consistent meetings. The meetings are designed to bring the members together to make their deposits in front of the group, assurance that every member is participating. Mobile money decreases the need for frequent meetings, as there are solutions that allow deposits to be logged without compromising transparency, as discussed above.

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## 4. Methodology

This section presents the methodology adopted by the study. The section first presents the theoretical framework, and then a sub-section describing the empirical model of the paper. Thereafter, it reviews the econometric approach used and analyses the variables included and how they are measured. Finally, it highlights the data source, data type and the tests to be conducted on the data.

### 4.1 Theoretical Framework

Household mobile money savings pattern can be viewed as a mirror image of the consumption theory, as income is either consumed or saved, thus the theory that explains the allocation of income towards consumption is equally used in explaining savings. This study borrows from Pigou's model based on the Cambridge Cash Balance Theory. The author emphasizes the function of money as a store of value other than a medium of exchange. The function of money as a store of value lays stress on holding money as a general purchasing power by individuals over a period for the sale and purchase of goods or services and subsequent transactions in the future. Marshall and Pigou focused their analysis on the factors that determine individual demand for holding money in the form of cash, which can be considered savings. They also recognized that current interest rate, wealth owned by individuals, expectations of future prices and future rate of interest determine the demand for money and substantial allocation to savings. They also believed that changes in these factors remain constant and are proportional to changes in an individual's income. They viewed that an individual's demand for money in the form of cash balances is proportional to their nominal income (Equation 4), where  $M_d$  is demand for money,  $Y$  is real national income,  $P$  is the aggregate price level of currently produced goods and services,  $PY$  is nominal income and  $k$  is the proportion of nominal income that people want to hold as cash balances, and therefore represents the household's propensity to save money.

$$M_d = kPY \tag{8}$$

The model assumes savings dependence on income and prices only. However, literature has shown that there are other factors including financial technology, which accelerates the rate of savings. In addition, other factors influencing savings behaviour are interest offered, price of commodities, wealth of households, inflation rate, and family institutional factors, among others.

The model in equation 8 can thus be modified as equation 9 as follows:

$$M_d = F(Y, P, r, \Delta P/P, U \dots) \quad (9)$$

We modify the model to incorporate the other factors. This approach will be applied with modification to incorporate the demographic characteristics and technological perception of a household.

## **4.2 Empirical Model**

The empirical model is based on the theoretical model. It seeks to analyse the household choice of savings via mobile money and highlight the determinants of mobile money savings behaviour in the process of economic growth and transformation. It links savings to income sources, perceptions, ease in the adoption of mobile money associated technology, savings incentives and the main uses of mobile money savings. The model can be expressed as:

$$MM_i = \alpha + \beta X_i + S_i \quad (10)$$

The dependent variable  $MM_i$  is a dummy that takes a value of one (1) if the household currently uses mobile money savings services, and zero (0) if they are not using mobile money for savings purposes.  $X_i$  is a vector of household and contextual characteristics that may influence the decision to use mobile money for savings;  $S_i$  is the random error term. The following regression model is used to establish the relationship between the choice of using mobile money for savings purposes and the perception of households of mobile money as a tool of savings, income of users, adaptability of mobile money and the incentives to save. The household saving decision is expressed as follows:

$$S = \beta_0 + \beta_z X_i + \varepsilon_i \quad (11)$$

Where  $i = \dots N$ ,

$S$  is the dependent variable and it represents savings demand options categorized as those using mobile money savings and those not using mobile money for savings,  $X$  represents the various determinants of household savings demand decisions, which are demographic, social and economic in nature. This is from the previous literature review, where several theories and empirical studies postulate various factors affecting household savings decisions.

$$S = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \Sigma \dots\dots\dots (12)$$

Where:

$S$  = Savings practices of a household/ use of mobile money to save or not

The dependent variable is expressed as a function of the variables:

$\beta_0$  = Constant

$X_1$  = Perception and ease in the adoption of mobile money/ trust

$X_2$  = Demographics of households

$X_3$  = Income sources

$X_4$  = Incentives to save

$X_5$  = Uses for mobile money savings

$\Sigma$  = Error term of the model

$\beta_1, \beta_2, \beta_3, \beta_4$  and  $\beta_5$  = Coefficients of independent variables

This study estimated a probit model with the dependent variable being categorized as those currently using mobile money for saving (1), and not using mobile money for saving (0).

**Table 4.1: Definition of variables**

<p><b>Ease in adoption/ perception of the savings platform</b></p> <ul style="list-style-type: none"> <li>• Easy and convenient</li> <li>• Safe place to save</li> <li>• Trust</li> <li>• Effectiveness of savings</li> <li>• User-friendly transactions</li> </ul>	<p><b>Dependent variable</b></p> <p><b>Saving practices of households</b> Use of Mobile Money for Saving</p>
<p><b>Demographic of households</b></p> <ul style="list-style-type: none"> <li>• Age</li> <li>• Sex</li> <li>• Location</li> </ul>	
<p><b>Incentives to save</b></p> <ul style="list-style-type: none"> <li>• Earn interest</li> <li>• Cost of transacting</li> <li>• Credit Access</li> </ul>	
<p><b>Income source of households</b></p> <ul style="list-style-type: none"> <li>• Employed</li> <li>• Self Employed</li> <li>• Unemployed</li> <li>• Income level</li> </ul>	



**Uses for money savings**

- Investment purposes
- Farming activities
- Start a new business
- Buy land
- Financial goals

### 4.3 Data Source and Type

This analysis relies on cross-sectional data collected from the 2021 FinAccess household survey, a joint initiative between the Kenya National Bureau of Statistics, Financial Sector Deepening (FSD) Kenya, and the Central Bank of Kenya. The survey was designed to track and measure the drivers, growth, and usage of mobile money use for savings in Kenya. Of the 25,720 eligible households for interviews for data collection, 22,024 recorded successful interviews. This led to the realization of a positive response rate of 85.6 per cent, with rural dwelling response at 88.6 per cent and urban at 80.5 per cent.

The descriptive statistics for the variables used and their construction in the model is as outlined in the tables below.

**Table 4.2: Descriptive statistics**

Variable definition	Variable	Obs	Mean	Std. Dev.	Min	Max
Money use	mm use	22,023	0.513	0.500	0	1
money perception	mm perception	22,023	0.354	0.478	0	1
money incentive	mm incentive	22,023	0.088	0.284	0	1
Sex	Sex	22,023	0.450	0.492	0	1
goal basic needs	goal basicneeds	22,023	0.808	0.394	0	1
goal investment	goal investment	22,023	0.186	0.389	0	1
save to secure future	save securefuture	22,023	0.548	0.498	0	1
save for business invest	save bussinessinvest	22,023	0.121	0.327	0	1
save for personal investment	save personalinvest	22,023	0.060	0.238	0	1
save for basic needs	save basicneeds	22,023	0.454	0.498	0	1
save for agricultural development	save agricdvlpt	22,023	0.052	0.222	0	1
Location	Location (1-rural, 2-Urban)	22,023	1.344	0.475	0	1
Age	Age groups	22,023	2.556	0.866	1	5
Income	Income groups	22,023	1.066	0.332	1	6
source of income	source (farming=1)	22,023	0.211	0.408	0	1
source employed	source (employed=1)	22,023	0.369	0.483	0	1

source self-employed	source (self-employed=1)	22,023	0.169	0.374	0	1
source unemployed	source (unemployed=1)	22,023	0.252	0.434	0	1

Source: Author's computation, 2022

**Table 4.3: Construction of variables**

Description	Variables	Label	Value	Freq.	%
Household use of Mobile money to save	Save through mobile money	No	0	10,733	48.74
		Yes	1	11,290	51.26
Dependent Variables					
If Household Perception of Mobile money influences their saving	Perception & Ease in adoption	No	0	14,224	64.59
		Yes	1	7,799	35.41
If Incentives influence households saving via mobile money	Incentive	No	0	20,074	91.15
		Yes	1	1,949	8.85
Gender of Mobile Money saving platform	Gender	Male	1	12,997	59.02
		Female	2	9,026	40.98
Household Financial Goals	Goal is to meet future basic needs	No	0	4,221	19.17
		Yes	1	17,802	80.83
	For Investment	No	0	17,922	81.38
		Yes	1	4,101	18.62
Intended Use of Savings	To secure the future	No	0	9,953	45.19
		Yes	1	12,070	54.81
	For business Investment	No	0	19,351	87.87
		Yes	1	2,672	12.13
	For Personal Investment	No	0	20,699	93.99
		Yes	1	1,324	6.01
	For meeting basic needs	No	0	12,021	54.58
		Yes	1	10,002	45.42
For Farm and agriculture use	No	0	20881	94.81	
	Yes	1	1142	5.19	

Location	Rural	Rural	0	14,454	65.63
		Urban	1	7,569	34.37
Mobile user's age	Age	<=18	1	1,694	7.69
		>=19 and <=35	2	9,825	44.61
		>=36 and <=60	3	7,503	34.07
		>=61 and <=80	4	2,575	11.69
		>=81 and <=120	5	426	1.93
Household's Income level	Amount of Income per month	<=25000	1	20,914	94.96
		>=25001 and <=50000	2	889	4.04
		>=50001 and <=75000	3	125	0.57
		>=75001 and <=100000	4	61	0.28
		>=100001 and <=200000	5	30	0.14
		>=200001 and <=450000	6	4	0.02
Source of Household Income	Farming	No	0	17,387	78.95
		Yes	1	4,636	21.05
	Employed	No	0	13,888	63.06
		Yes	1	8,135	36.94
	Self Employed	No	0	18,311	83.14
		Yes	1	3,712	16.86
	Unemployed	No	0	16,483	74.84
		Yes	1	5,540	25.16
Number of Observations				22,023	

*Source: Author's computation (2022)*

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## 5. Results and Discussion

The section outlines the character of the data, and the interpretations of the results, which inform our conclusion, recommendations, and policy implications. Due to the nominal nature of most of the variables, we review their respective relative frequencies distribution and analyse the marginal effects of the variable on the dependent variable.

### 5.1 Determinants of Savings via Mobile Money

The key determinants of whether an individual chooses to save via mobile money or not are as detailed in Table 5.1. The significance of the results is determined at a 5 per cent level. All variables are seen to significantly influence households savings via mobile money, at level one, apart from the financial goal of the households and high-income levels, which do not show a notable impact on the use of mobile money for savings by households. Also, the source of a household's income is not significant in influencing the use of mobile money for savings by a household. The goodness of fit test of value 0.000 shows that the model is well fit in predicting the observations from the data.

**Table 5.1: Factors that affect household's mobile money savings**

Below are the marginal effects of the variables on the household choice of using mobile money for saving.

	<b>Variables</b>	<b>Probit Model Results (t statistics in parentheses)</b>	<b>Marginal Effects for the Probit Model-dy/dx (Std. Err. in parentheses)</b>
Household perception of mobile money	Perception	1.238*** (52.49)	0.315 (0.005)
Incentives in savings via mobile money	Incentive	1.112*** (29.80)	0.283 (0.009)
Gender of household head	Male	-0.0536** (-2.59)	-0.014 (0.005)
Household Financial Goals	To meet future basic needs	0.00968 (0.07)	0.002 (0.037)
	For Investment	-0.00168 (-0.01)	-0.001 (0.036)

Intended use of savings	To secure the future	0.585*** (26.80)	0.149 (0.005)
	For business Investment	0.375*** (11.68)	0.096 (0.008)
	For Personal Investment	0.225*** (5.07)	0.057 (0.011)
	For meeting basic needs	0.600*** (28.96)	0.153 (0.005)
	For Farm and agriculture use	-0.0150 (-0.32)	-0.004 (0.012)
Location	Rural	0.156*** (6.83)	0.040 (0.006)
Mobile user's age	>=19 and <=35	0.697*** (14.53)	0.183 (0.012)
	>=36 and <=60	0.623*** (12.68)	0.163 (0.013)
	>=61 and <=80	0.362*** (6.63)	0.094 (0.014)
	>=81 and <=120	-0.383*** (-4.03)	-0.092 (0.022)
Household's Income level	>=25001 and <=50000	-0.202*** (-3.92)	-0.051 (0.013)
	>=50001 and <=75000	-0.304* (-2.37)	-0.077 (0.032)
	>=75001 and <=100000	-0.335 (-1.78)	-0.085 (0.047)
	>=100001 and <=200000	-0.329 (-1.37)	-0.083 (0.060)
Source of Household Income	Farming	0.029 (1.12)	0.007 (0.007)
	Employed	0.006 (0.29)	0.002 (0.006)
	Self Employed	-0.029 (-1.02)	-0.007 (0.007)
	Unemployed	-0.0134 (-0.52)	-0.003 (0.007)
Constant		-1.861*** (-12.07)	
R <sup>2</sup>		0.3425	
Prob > chi <sup>2</sup>		0.0000	
Number of Observations		22019	22,019

*Source: Author's computation (2022)*

Note:

- $dy/dx$  for factor levels is the discrete change from the base level
- \*\*\*/\*\*/\* denote level of significance at 1%, 5% and 10% level respectively (\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ )
- Base categories are: Gender- male, user age  $\leq 18$  years, Income level  $\leq 25000$ , Location- Rural.

### 5.1.1 Use of mobile money for saving

Of all the households sampled, 51.26 per cent use mobile money for savings purposes. This implies that at least half the households have embraced technology and save money via mobile money. Of the variables, income level, investment as a financial goal, use of savings for farm agriculture developments and being unemployed/self-employed are seen to negatively impact mobile money savings, with the rest positively influencing it.

### 5.1.2 Perception of mobile money

At least a third of the household savings via mobile money indicate to do so because they feel that it is a platform that is safe, confidential, easy to use, most trusted and convenient platform. The effect of such a positive opinion is seen to increase the household's likelihood of saving via mobile money by 0.31, being 31 per cent.

### 5.1.3 Demographic of households

#### a) Gender of household head

Most of those who use mobile money to save are male, which could be attributed to most males being the household breadwinners, and more tech-savvy compared to the women. The likelihood of savings via mobile money reduces by a slight probability of 0.1 in the case of a female mobile money user. The implication of this result is that boosting female participation in the labour force could empower them and increase their financial muscles, thus increasing their ability to save more.

#### b) Age

Most of those savings via mobile money platforms are the youth, below 35 years and adults in their prime working ages of between 36 to 60 years, at 44 and 34 per

cent, respectively. Those in this age group are usually with some form of income stream, and much more informed on the use of mobile technologies compared. The likelihood to save via mobile money increases by 18 per cent with an increase in age cluster, apart from the ages of between 81 to 120, where the likelihood decreases by approximately 0.09, thus rounded off, being approximately by 10 per cent, and thereafter negatively impacting mobile savings, with continued age advancement. This is in line with the findings of Kibet et al. (2009) and could be attributed to a reduction in the visual ability of the old, thus limiting their use of mobiles.

#### *c) Location of residence*

A larger population live in rural areas, with 34 per cent of them being in urban towns. However, the likelihood of savings via mobile money increases with locality as one moves from rural areas to an urban centre. The likelihood of one savings via mobile money increases by 4 per cent if one is in an urban area. Residing and working in an urban area is positively correlated with savings, as urban areas such as cities have concentrated economic activities, thus more opportunities for labour and skills employment. Urban areas also enjoy proxy to quality tech infrastructure for connectivity, innovation and rollout.

#### **5.1.4 Incentives to save on mobile money**

Households savings via mobile money indicate that up to 9 per cent of them do so because of the incentives they derive from this fintech platform, which includes ease in access of funds during emergencies; increase of their credit limit and enables access of a lump sum at the end of set durations. These incentives are seen to increase the likelihood of a household savings via mobile money by 28 per cent.

#### **5.1.5 Income level and livelihood of households**

Most of those saving via mobile money earn below Ksh 25,000 per month, with most being casual workers at 27 per cent, then farmers at 21 per cent. Those unemployed were also substantial at 25 per cent, and majorly dependent on family support. This implies that those with lesser earnings use mobile money for saving much more than those who earned more, from approximately Ksh 50,000, regardless of whether they received their money via mobile money or not. This may be because the latter most likely maintain their money on other platforms such as bank accounts. The likelihood to save via mobile money is seen to decrease across income levels as one advances up the levels.

### **5.1.6 Financial goals of household**

The future financial goal of households was not significant in influencing whether one would save via mobile money or not. However, most of those who saved in mobile money said they did so mainly with the goal of meeting their future basic needs, rather than in investment in a goal.

### **5.1.7 Uses for mobile money savings**

Up to 54 per cent of households savings via mobile money use these savings to secure their future needs, while 45 per cent use it to meet their basic need. Only 7 per cent who save here do so for business and personal investment use. The need for use in basic needs increases the likelihood of savings on mobile money by 15 per cent by 14 per cent if there is need to secure the future by 10 per cent if required use is business investment and by 6 per cent if use is personal investment.



## **6. Conclusion and Recommendations**

### **6.1 Conclusion**

The paper sought to examine the determinants of mobile money savings across households to leverage on the drivers in enhancing households' savings via this readily available platform. The study established the following:

- a) Mobile money perception – Up to a third of the users indicate that critical to them in choosing to save via mobile money is the safety and confidentiality it offers them, alongside their view on how easy it is to use.
- b) Gender – A significant share of the female population is not participating in mobile money savings, compared to male counterparts, with most of those savings on this platform being the youth and those of lower income cadres compared to those of the higher cadres.
- c) Those residing in urban areas seem to accrue more dividends by savings via mobile money than those who are in rural areas. This could be due to limited internet and infrastructure in the rural areas, alongside limited labour and work opportunities compared to the urban centres. Investing in rural development could therefore significantly accelerate the realization of higher savings among the residents.
- d) A high dependency ratio is seen to reduce savings among the unemployed and those in self-employment. Economic empowerment of these two groups could therefore be able to enhance savings among households.
- e) Incentives to mobile users are seen to positively influence use of the platform to save by household. This could further be enhanced by availing users, with the information and knowledge necessary to operate the innovation, the required internet infrastructure supported with access to power and other provision that can enhance mobile money use.
- f) Financial literacy among households is seen to positively influence savings, as those households with an initial intended plan for savings, seem to have a higher likelihood to save, than the rest who do not have an intention for the money saved.
- g) This study shows the significant effects of individual and household characteristics as predictors of savings via mobile money, to achieve enhanced sustainability of the economy.

## **6.2 Policy Recommendations**

To effectively harness the potential of mobile money in enhancing the savings culture among households, the following measures are recommended:

- a) In striving to enhance savings by households, the government could encourage and support mobile money providers in enhancing the safety and usefulness of these platforms, so that the users become more confident and trust its security, ease of use, and efficiency.
- b) Mobile money could be better incentivized to encourage most users to increasingly save, as this is presently the most preferred platform for mobile users. This would also include introducing interest earnings to amounts saved for specified durations and above specified amounts. Also, enhancing ease of accessing funds and savings over this platform, and promoting financial awareness of how mobile money can be used by households and individuals, especially those in rural areas is important.
- c) To encourage purposeful saving by households, mobile money could be linked to other financial platforms that would integrate the households' savings goal with an efficient mechanism of attaining the required amounts at the end of the period, or interest-friendly credit facility if the need arises.
- d) Stakeholders also need to ensure that savings' innovations in the mobile money platform are continuous and progressive, to be as favourable and competitive as the other savings platform in the market, if not better.
- e) There is potential to increase savings if women and the youth are further economically empowered and given opportunities in the labour market. This may entail inclusive financial training and education for women and youth, to increase productivity and financial access.
- f) Finally, savings remain critical in capital formation and thus private stakeholders and the government need to continually work together on modalities of enhancing saving both via the mobile money fintech platforms and others that have been well embraced by households.

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## Appendix

### Appendix 1: Income and wages channeled via mobile money

Source of Income	Household's main source of Income	Received payment via Mobile money	Did not receive payment via Mobile money	Total
Farming (crops, keeping livestock, fishing, aquaculture)	4,637	708	2,734	3,442
Employment	2,058	137	485	622
Payment of casual work	6,077	588	2,045	2,633
Running own   business/	3,140	593	916	1,509
Money from NGO Government/ Social transfer	306	65	435	500
Renting, Land/ House/ rooms/ equipment	104	83	72	155
From investments, e.g. shares, stocks	16	13	34	47
Pension/Annuity	146	5	131	136
Support from family/ friends/ spouse	5,540	1,500	1,587	3087

*Source: Author's computation (2022)*



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**Kenya Institute for Public Policy Research and Analysis  
Bishops Garden Towers, Bishops Road  
PO Box 56445, Nairobi, Kenya  
tel: +254 20 2719933/4, 2714714/5, 2721654, 2721110  
fax: +254 20 2719951  
email: [admin@kippra.or.ke](mailto:admin@kippra.or.ke)  
website: <http://www.kippra.org>**