FINANCIAL INCLUSION CONFERENCE:

UTILIZATION OF MOBILE MONEY SERVICES AND FINANCIAL INCLUSION IN KENYA (EVIDENCE FROM 2021 FINACCESS SURVEY DATA)

BY

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INTRODUCTION: FINANCIAL INCLUSION AND MOBILE MONEY SERVICES

- Financial inclusion entails offering less expensive method of expanding financial services to the unbanked population, particularly in rural areas (Winn and Koker, 2013).
- It was acknowledged by the World Bank as a driver of 7 of the 17 SDGs.
- It has the potential to lessen severe poverty and boost shared prosperity.
- The proliferation of mobile money services has increased access to financial services for the underprivileged population at fair prices (Mas, 2009)

TYPES OF MOBILE MONEY SERVICES

According to **(UNCTAD, 2012)**

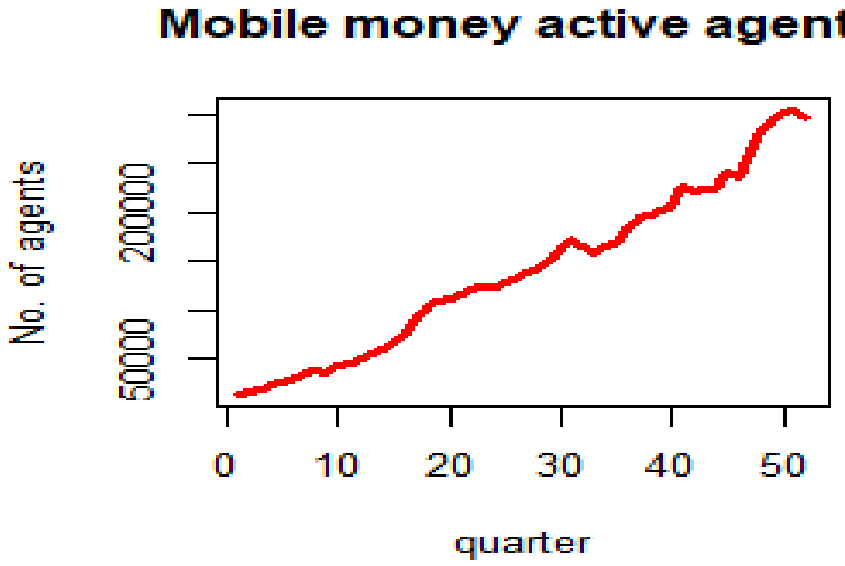
i. Mobile transfers (P2P) via Safaricom's M-Pesa, Airtel Money or T-Kash.

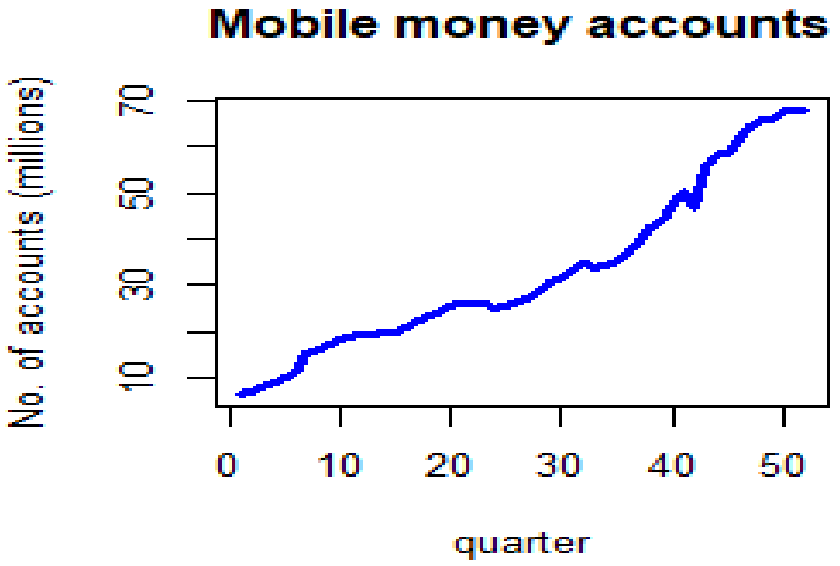
ii. Mobile payments are a way to pay for goods and services through Lipa na M-Pesa or Pay Bill using phones.

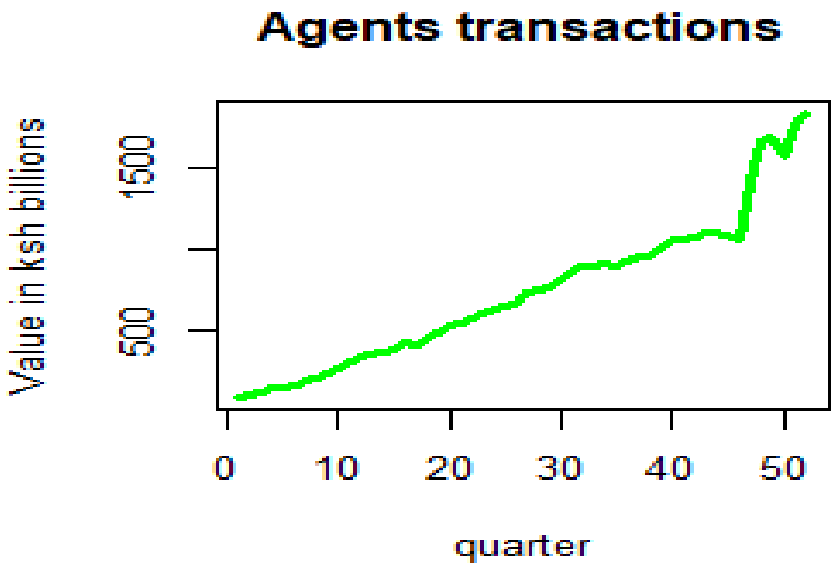
iii. Mobile financial services link the bank account to subscriber's mobile phone, which expands the scope of banking services to offer credit and savings through mobile banking.

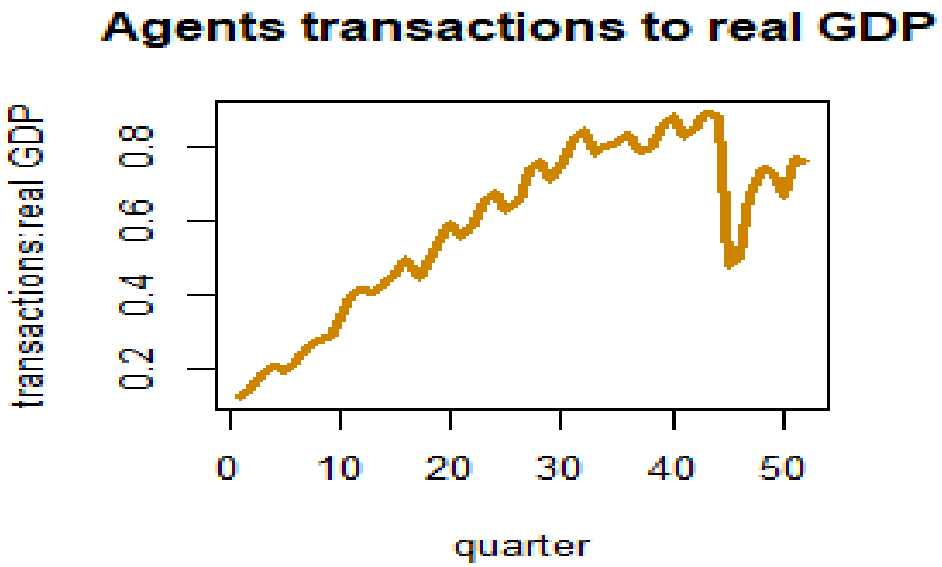
iv. Mobile microfinance through subscriber's mobile phone, for example Fuliza offered by Safaricom.

MOBILE MONEY… FROM Q12009 TO Q42021









STATEMENT OF THE PROBLEM

- Wakaba and Wepukhulu (2019) advocated more research on the long-term effects of mobile money and mobile banking services on financial inclusion.

- This study bridges the gap by evaluating the most recent FinAccess Survey 2021 data to understand how mobile money services lead to financial inclusion in Kenya.

- The services are evaluated in terms of loans, savings and payments.

RESEARCH OBJECTIVES

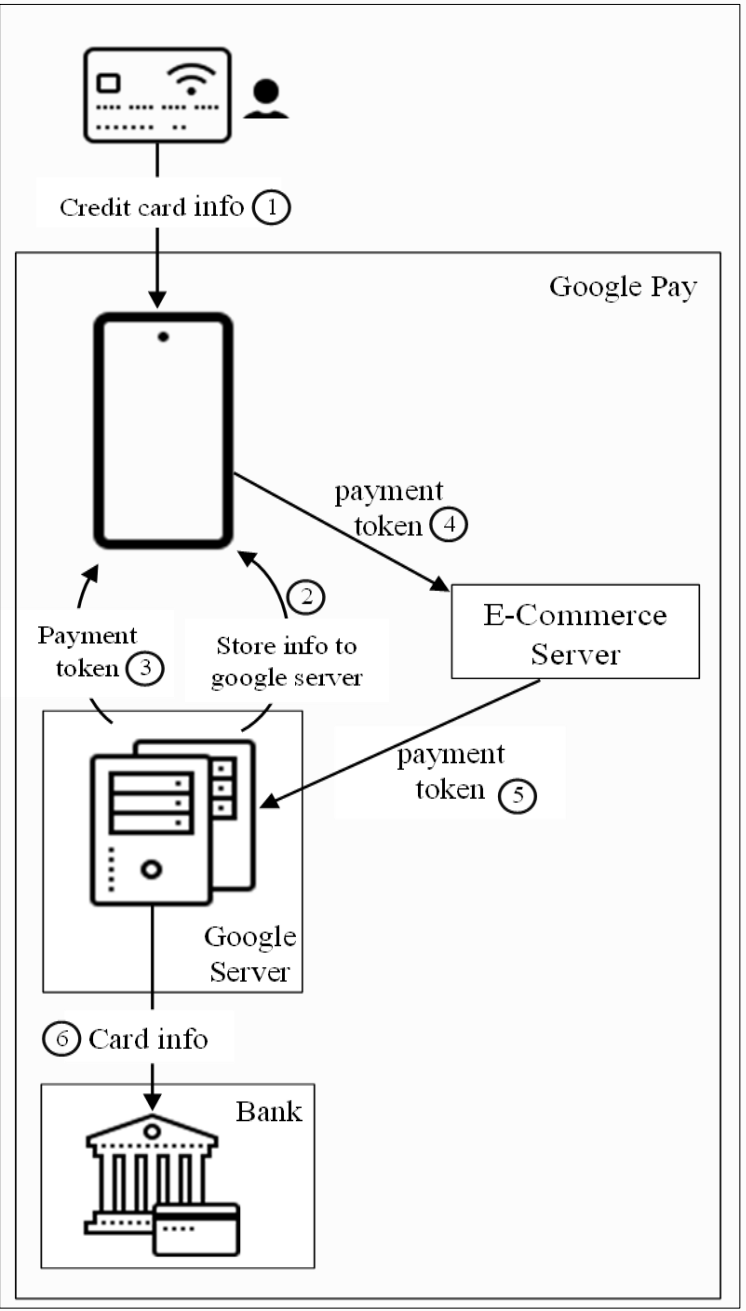
Main objective of the study:

- Examine utilization of mobile money services in Kenya using FinAccess 2021 survey data.

Specific objective of the study:

- Make conclusions on financial inclusion in Kenya based on research findings.

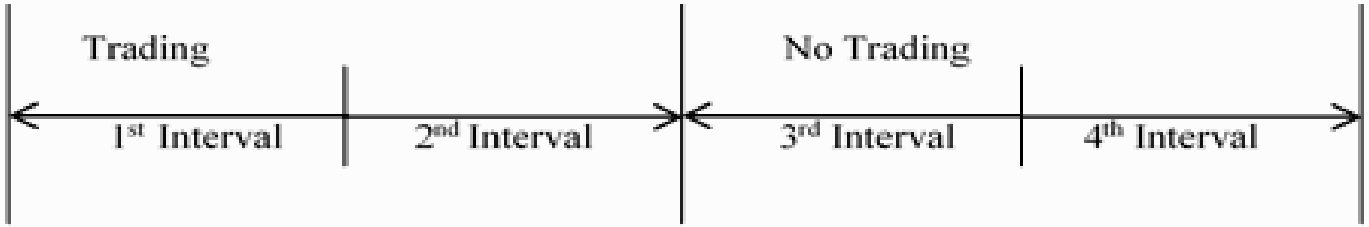
THEORETICAL REVIEW: MODEL OF FINANCIAL DEEPENING AND GROWTH



Robert M. Townsend (1980) Walrasian centralized exchange system with electronic debits and credits.

- Spatially dispersed households were electronically linked to a central account.
- Intra-period debt could be held for within-period purchases.
- Electronic credits could be exchanged between households that purchase goods from other households.
- Balances are settled and accounts cleared at the end of the trading period.
- Increase in the balances of electronic money is matched by a deposit of physical money.

TURNPIKE MODEL BY MANUELLI AND SARGENT WITH MONEY AND DEBT



- Incorporates private credit and fiat money.
- Agents cannot execute deals that span half-years since they are only together for two subintervals (one half-year).
- They cannot issue long-term debt.
- Assuming that when the agents are not in physical contact during the two specified periods, but are instead connected electronically, via mobile money.
- As this technology advances, agents will be able to issue longer-term loans.

OUTCOMES OF FINANCIAL INTERCONNECTEDNESS … MOBILE MONEY SERVICES

Walrasian centralized exchange system	Turnpike model
▪ Inefficient because agents held money without interest.	▪ Incorporates monetary policy actions.
▪ Increased national income per capita.	▪ In the absence of private credit, such as mobile money, increasing the supply of money often reduces the level of output without changing its volatility.
▪ Fiat money decreases.	▪ In the presence of private credit, increasing the supply of money raises prices and makes output more volatile.
▪ A growth in private debt per capita.	
▪ A decline in the level of fiat money relative to income.	
▪ A rise in credit compared to income.	

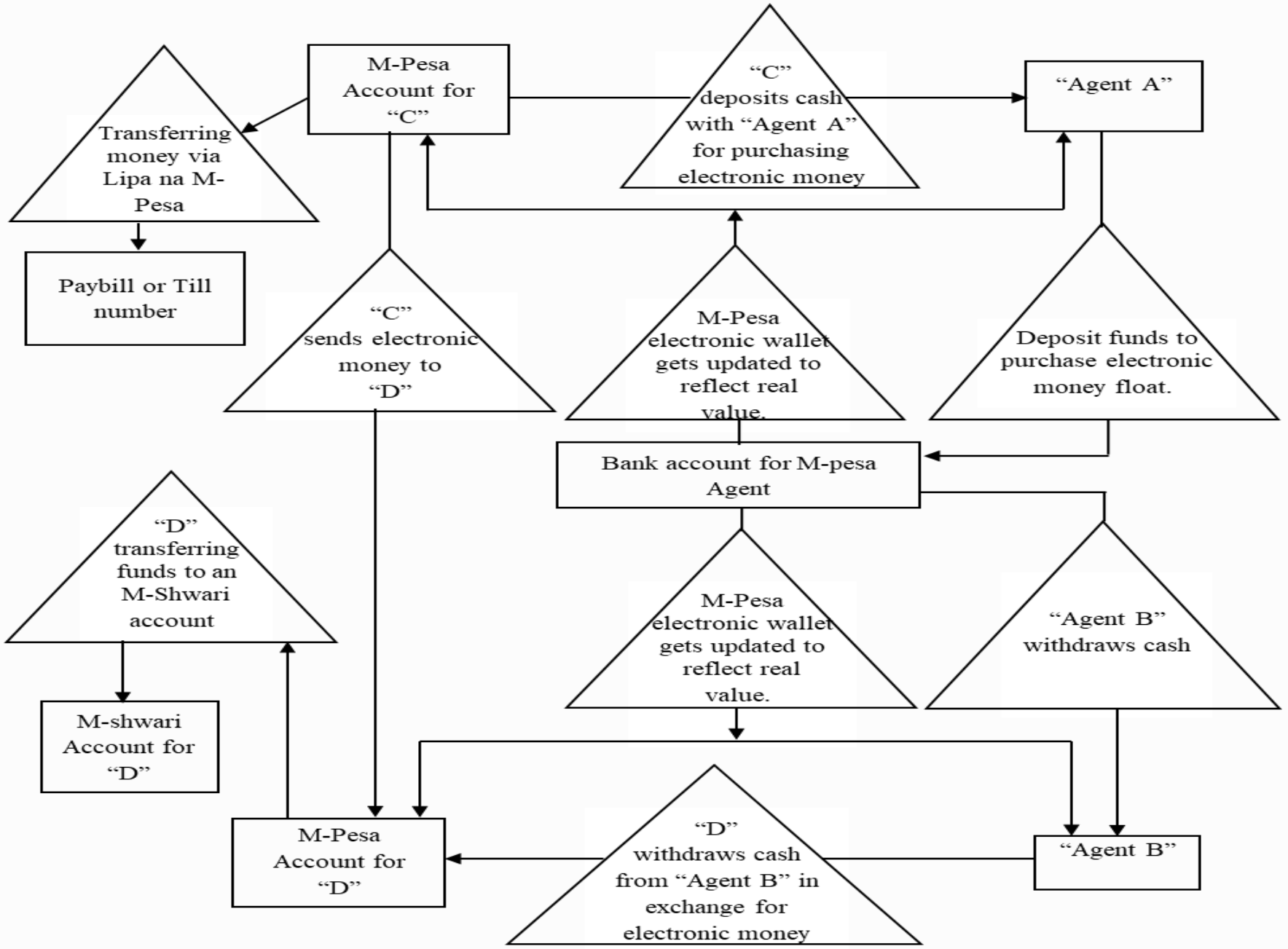
Motivation of the paper

i. Mobile money has the potential to influence monetary policy target variables.
ii. Policy should reflect the changes that mobile money has had on the financial system.

EMPIRICAL LITERATURE

Authors	Summary findings
Riley (2016) Tanzania	✓ All households in the villages with mobile money users were completely protected against idiosyncratic shocks such as illness. ✓ Households without mobile money were uninsured and experienced a reduction in consumption equal to the shock.
Suri and Jack (2016) Kenya	✓ Access to mobile money services increased household savings by more than a fifth. ✓ It encouraged 185,000 women to work full-time in business or retail, which reduced extreme poverty among households headed by women by 22 percent.
Jack and Suri (2014) Kenya	✓ For non-users of the M-Pesa and users with inadequate network access, a sudden decrease in income had a negative impact on food and other expenditures by 7–10 percent.
Bharadwaj et al., (2019) Kenya	✓ 34 percent of individuals who qualify for an M-Shwari loan choose to take one. ✓ Families are 6.3 percentage points less likely to cut back on spending as a result of adverse shocks. ✓ M-Shwari loan tends to increase both access to credit and resilience to financial shocks.

CONCEPTUAL FRAMEWORK: MOBILE MONEY SERVICES



RANDOM UTILITY MODEL

- When a mobile money product user selects a random utility from a finite set, it implies that there is a random vector $(U_1, \ldots, U_j)$ unique up to an increasing monotone transformation.

- The probability of choosing any alternative increases $i \in M$ where M, the choice set, is given by $P_i = \Pr(u_i > u_j)$ for all $i \neq j \in M$.

MULTINOMIAL LOGIT REGRESSION MODEL

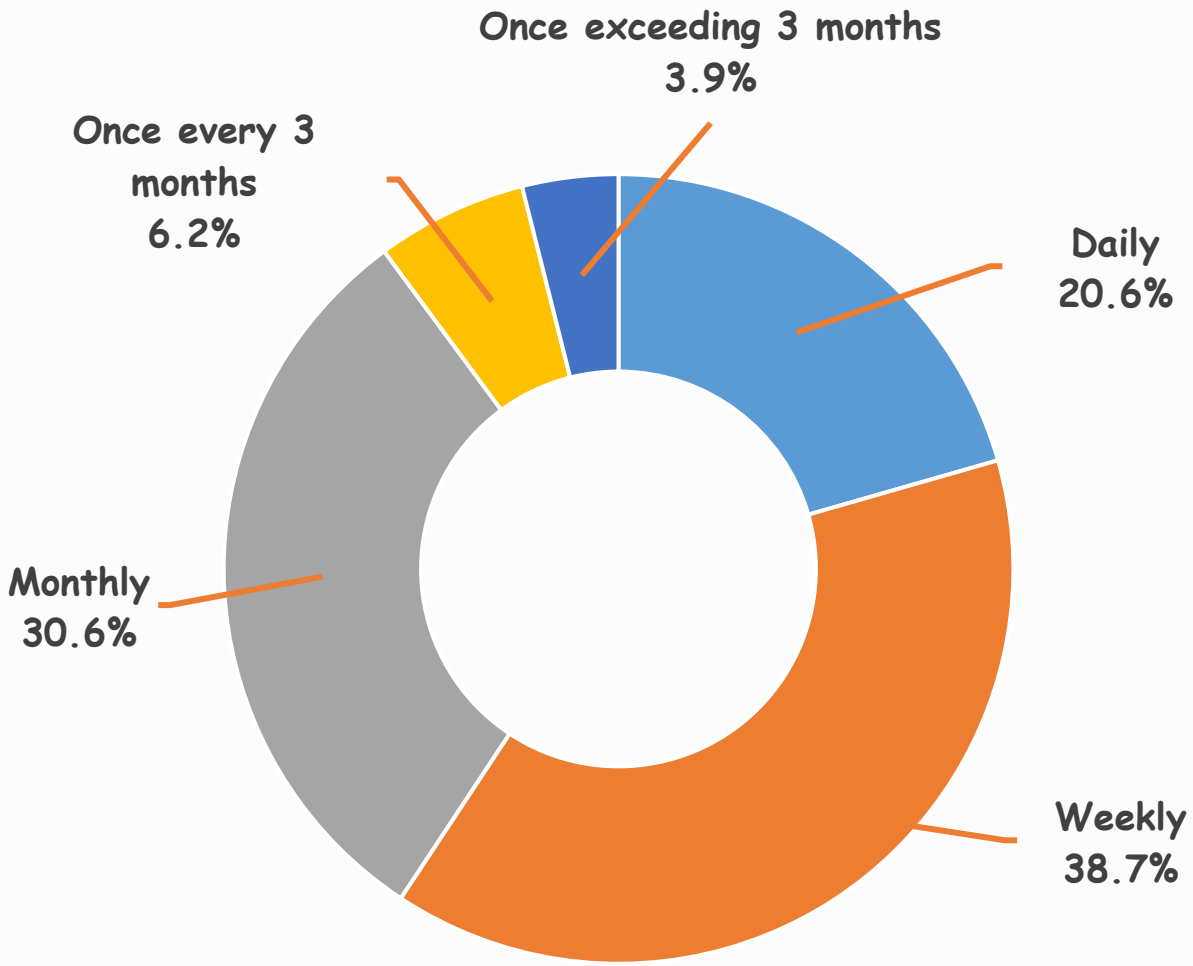
$$\text{logit}(\pi_i) = \log\left(\frac{\pi_i}{1 - \pi_i}\right) = \beta_0 + \beta_1 x_{1_i} + \beta_2 x_{2_i} + \ldots \beta_p x_{p_i} \ldots \text{eq. } 1$$

- The logit of the probability in $\text{eq. } 1$ is the log of the odds of using a mobile money service.

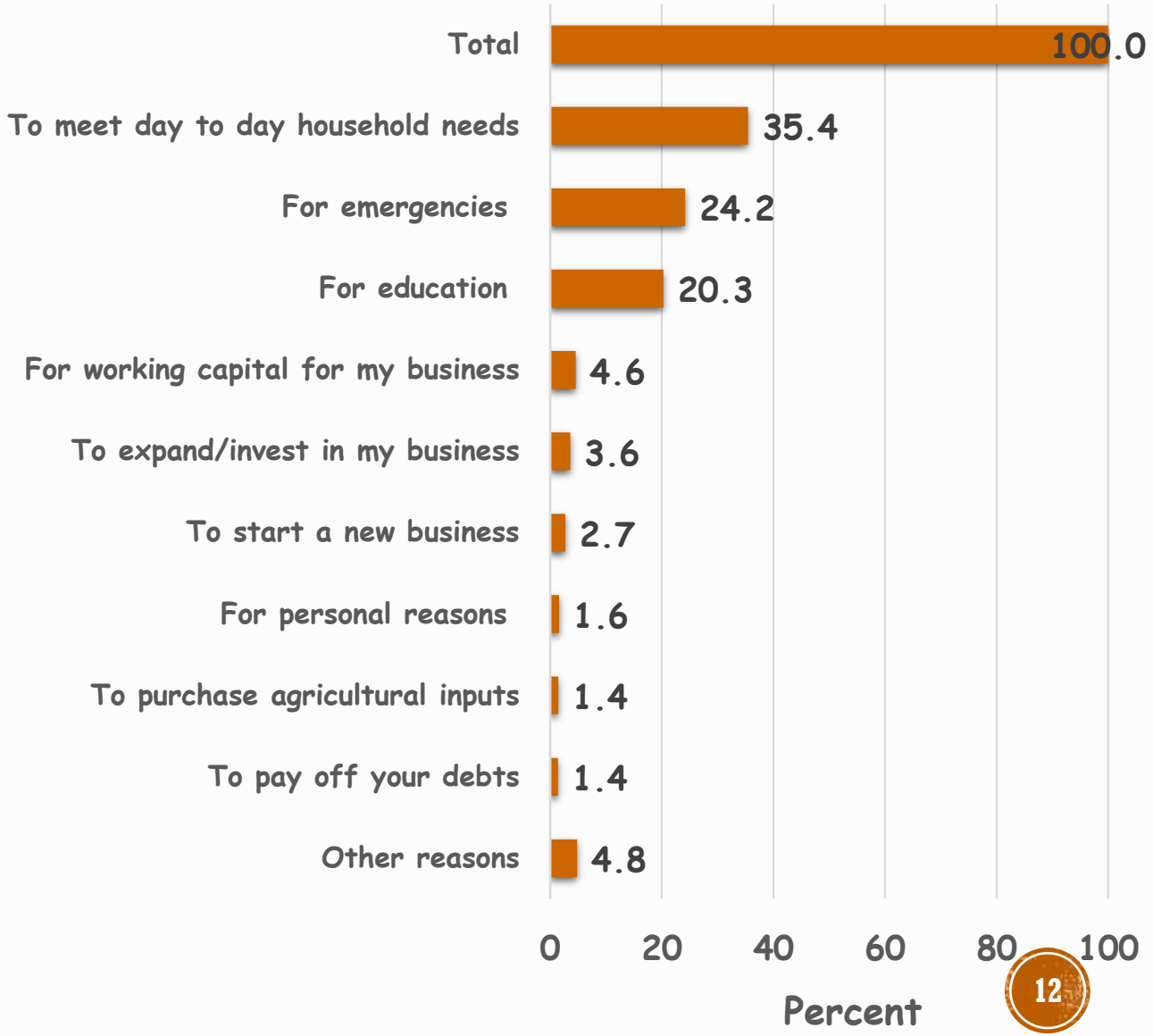
- The independent variables in the model $(\text{eq. } 1)$ are: x_{1_i} – livelihood category, x_{2_i} – wealth quintile, x_{3_i} – sex, and x_{4_i} is cluster type.

DESCRIPTIVE STATISTICS

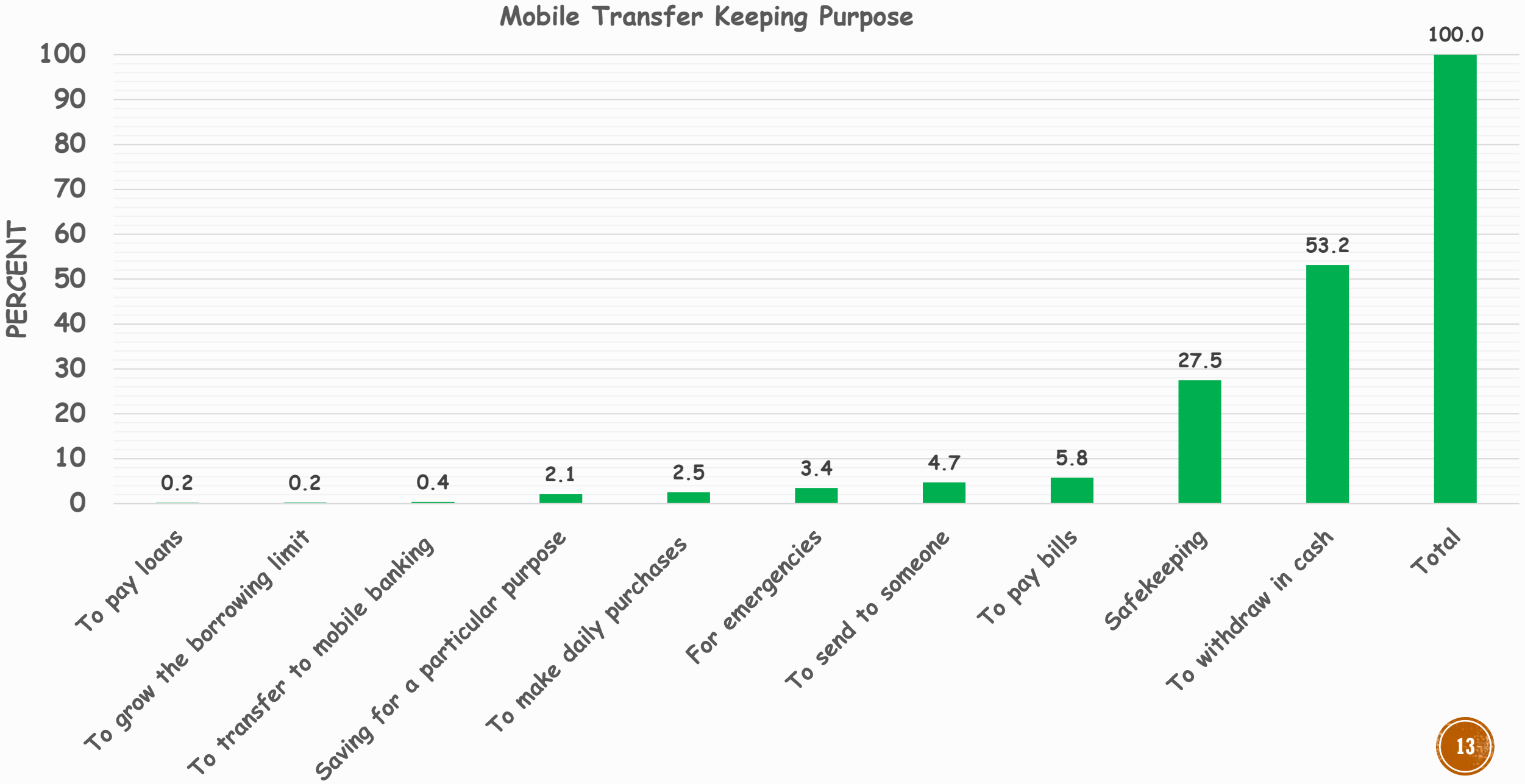
Mobile Money Frequency of Use



Reason for taking mobile bank loan (e.g. M-Shwari, KCB M-Pesa)



SAVING USING MOBILE MONEY …



CORRELATION MATRIX

Variables			Correlation coefficient sign
Livelihood category (agriculture → dependent)	mobile banking loans and savings products.		Positive (+)
	paying monthly bills	mobile money account pay bill/till number	Negative (-)
	everyday expenses		
Quintile (lowest → highest)	mobile banking loans and savings products.		Negative (-)
	paying monthly bills	mobile money account pay bill/till number	Positive (+)
	everyday expenses		
Gender (male → female)	mobile banking loans and savings products.		Positive (+)
	paying monthly bills	mobile money account pay bill/till number	Negative (-)
	everyday expenses		
Cluster type (rural → urban)	mobile banking loans and savings products.		Negative (-)
	paying monthly bills	mobile money account pay bill/till number	Positive (+)
	everyday expenses		

REGRESSION RESULTS AND MARGINAL EFFECTS… LIVELIHOOD

Livelihood category	Currently use					
	mobile banking loan		Fuliza loan		Savings through mobile banking	
	Coefficient	$\frac{\partial E(y\|x)}{\partial x}$	Coefficient	$\frac{\partial E(y\|x)}{\partial x}$	Coefficient	$\frac{\partial E(y\|x)}{\partial x}$
Agric						
Employed	0.573	0.039	0.414	0.049	0.810	0.079
	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***
Casual	0.049	0.003	0.335	0.040	0.066	0.003
	0.560	0.591	0.000***	0.000***	0.375	0.653
Own business	0.666	0.048	0.368	0.044	0.758	0.073
	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***
Dependent	-0.692	-0.028	-0.568	-0.053	-0.544	-0.032
	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***

1-unit increase in those that are employed, casual and own business leads to increases in the relative log odds of those who currently use mobile banking loans and savings products. However, for dependent it leads to decreases in the relative log odds.

REGRESSION RESULTS AND MARGINAL EFFECTS… LIVELIHOOD

Livelihood category	Paid monthly bills		Paid daily expenses	
	Coefficient	$\frac{\partial E(y\|x)}{\partial x}$	Coefficient	$\frac{\partial E(y\|x)}{\partial x}$
Agric				
Employed	0.238	0.054	0.385	0.056
	0.000***	0.000***	0.000***	0.000***
Casual	-0.238	-0.049	-0.250	-0.029
	0.000***	0.000***	0.000***	0.000***
Own business	0.155	0.035	0.237	0.033
	0.004***	0.004***	0.000***	0.000***
Dependent	-0.676	-0.127	-0.519	-0.055
	0.000***	0.000***	0.000***	0.000***

The probability of a discrete change in livelihood category among individuals who use a mobile money account for paying monthly bills and everyday expense is higher among those who are employed and own a business than among those in agriculture, respectively. Casuals and dependents have a lower probability, respectively, than those in agriculture.

REGRESSION RESULTS AND MARGINAL EFFECTS… QUINTILE

	Currently use					
Quintile	mobile banking loans		Savings through mobile banking		Paid monthly bills - a mobile money account	
	Coefficient	$\frac{\partial E(y\|x)}{\partial x}$	Coefficient	$\frac{\partial E(y\|x)}{\partial x}$	Coefficient	$\frac{\partial E(y\|x)}{\partial x}$
Lowest						
Second Lowest	1.203	0.031	1.287	0.051	0.574	0.075
	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***
Middle	1.707	0.058	1.550	0.069	1.029	0.155
	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***
Second Highest	2.036	0.081	2.041	0.115	1.625	0.288
	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***
Highest	2.567	0.127	2.698	0.200	1.968	0.373
	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***

The probability of a discrete change in quintile among individuals who currently borrow loan from mobile banking, save through mobile banking and pay monthly bills is higher among those who are in second lowest, middle, second highest and highest than those in lowest respectively.

REGRESSION RESULTS AND MARGINAL EFFECTS… SEX AND CLUSTER TYPE

Currently use	Sex				Cluster type			
	Male		Female		Rural		Urban	
	Coef.	$\frac{\partial E(y\|x)}{\partial x}$	Coef.	$\frac{\partial E(y\|x)}{\partial x}$	Coef.	$\frac{\partial E(y\|x)}{\partial x}$	Coef.	$\frac{\partial E(y\|x)}{\partial x}$
mobile banking loans			-0.256 0.000***	-0.010 0.000***			-0.929 0.207	-0.009 0.012**
fuliza loan			-0.097 0.095*	-0.022 0.000***			0.108 0.135	0.012 0.048**
savings through mobile banking			-0.200 0.000***	-0.016 0.000***			0.081 0.194	-0.016 0.000***
paid monthly bills			-0.125 0.000***	-0.025 0.000***			0.640 0.115	0.013 0.116
paid daily expenses			-0.163 0.000***	-0.019 0.000***			-0.356 0.477	-0.004 0.476

CONCLUSION: FINANCIAL INCLUSION AND EXCLUSION

- ✓ If livelihood category, quintile, sex and cluster type are 0, then the logit index of those who currently use mobile banking loans and savings products, and pay monthly bills and everyday expenses through a mobile money account is the constant term negative (-).

- ✓ 35.4% borrow via either mobile banking or fuliza to cover day-to-day household requirements.

- ✓ 53.2% save money in their mobile money accounts to withdraw when they need it.

LIVELIHOOD CATEGORY

- ❑ The rationale for lower use of mobile money services in agriculture can be explained by the long-term nature of agricultural output in comparison to other sectors. Mobile money loans are fairly short-term in nature, with repayments occurring on a daily, weekly, or monthly basis, making them unsuitable for farmers.

- ✓ Recommendation: Rolling out of more friendly mobile money services for agriculture sector.

CONCLUSION: FINANCIAL INCLUSION AND EXCLUSION

Variables	Recommendations
WEALTH QUINTILE ▪ The impoverished including dependents face restraints such as volatile and low incomes (Pazarbasioglu et al., 2020 and Nanziri, 2017).	✓ Expanding services geared at use by all in the society.
SEX ▪ Females have lower literacy and trust than males, causing them to be financially excluded. ▪ Allen et al., (2016), females could be voluntarily excluded because their spouse has an account.	✓ Closing gender gap by educating women.
CLUSTER TYPE ▪ Rural areas have higher probabilities of discrete change in taking mobile banking loans (0.9%), savings through mobile banking (1.6%) and paying daily expenses (0.4%) compared to urban areas.	✓ Evidence that persons living in rural areas were increasingly using mobile money financial services was apparent.