

# Determinants of Utilization of Mobile Money Services by Micro and Small Enterprises in Kenya

Evans Kirui\*, Perez O. Onono and Joseph M. Muniu

*Department of Applied Economics, Kenyatta University, Nairobi, Kenya*

## Abstract

The objective of this study was to establish the determinants of utilization of mobile money services by micro and small enterprises in Kenya. In the study, 2016 Micro, Small and Medium Enterprises establishment data set by Kenya National Bureau of Statistics was used. To establish the determinants of utilization of mobile money services by firms in Kenya, heteroskedastic probit model was estimated. The results of the study indicated that group membership, gender, credit access, education, mobile phone ownership, radio ownership, registration of business, number of business units and total number of employees determined utilization of mobile money services. The study recommended the need for the government through the regulatory authorities and mobile money services providers to design supportive policies that would scale up the utilization of mobile money services to more financially excluded MSEs in Kenya, specifically through addressing the infrastructural constraints in rural areas, outreach services, and other incentives that would encourage more uptakes of mobile money services.

**Keywords:** Utilization • Heteroskedastic • Mobile money services • Determinants

## Introduction

A developed and efficient financial sector is a vital tool for economic development to be realized particularly through mobilization of capital funds for productive investment [1]. However, for financial sector to achieve financial inclusion that would enhance economic development, financial services should be accessible and affordable particularly to those financially excluded and the vulnerable groups [2]. Mobile money, a financial product which enables the users have access to financial services via a mobile handset, has tremendously changed the access to finance landscape for many people particularly those who had formerly been financially excluded especially in Sub-Saharan African region [3]. Unlike formal financial institutions with many requirements to be met such as establishing bank branches to cover wider areas, mobile money services are offered through a mobile phone. The robust penetration of mobile phones ownership to more than 60 percent of Africa's population has seen the surge in the uptake and utilization of mobile money services [4]. The upsurge in mobile money utilization has been an essential factor in widespread of mobile money agents particularly in rural areas which has made mobile financial transactions more affordable and convenient. By bringing financial service centers closer to users and the consequent reduction in costs associated with its access, mobile money services are expected to boost financial deepening by enhancing financial services uptake thereby reducing poverty and vulnerability [5]. Furthermore, mobile money facilitates domestic remittances thereby effectively cushioning consumption expenditure against various types of shocks [6]. Mobile money services have been rapidly rising across Sub-Saharan Africa in terms of subscription and transactions. In 2017, the total number of mobile money services transacted rose by 14.4 percent while its value increased by 17.9 percent. Towards the end of 2017, 135 and 122 million active mobile money services and mobile money accounts across the region were registered. Across the continent, mobile money services have been fundamental in

financial services coverage specifically to the people with constrained access to brick and mortar financial institutions, particularly among the women and the rural residents. Despite the developments in mobile money services as an alternative to financial services access in Kenya, majority of MSEs are still grappling with myriad of challenges related to high levels of financial services exclusion particularly from formal financial institutions and other bottlenecks in attempt to access credit [7]. Approximately 2.2 million firms closed in the period 2011-2016 with more than 46 percent shutting business one year after starting their operations [7]. The remainder of this article is structured as follows: the following section discusses the background of the study on the MSEs' utilization of mobile money services in Kenya. The third section delineates the theoretical structure and the specification of the empirical model used in the study. The fourth section presents variables' definition and their measurements used in the study. Empirical findings of the study are presented in section five while the last section presents concluding remarks from the study.

## Background

### Utilization of mobile money services by micro and small enterprises in kenya

Micro and Small Enterprises (MSEs) in Kenya play an essential part in employment and wealth creation in the economy [7]. MSE sector is an important part of economy since they produce a substantial value of total added value besides providing most affordable goods and services thus increasing growth, innovation and prosperity. In Kenya, MSEs operations covers almost every spheres of the economy and they economically sustain a majority of the households. Besides increasing output of goods and services, the sector has also bolstered both forward and backward linkages among different sectors of the economy. This has greatly enhanced participation of many Kenyans in various economic activities hence creating opportunities to cultivate and nurture both entrepreneurial and managerial skills [7]. According to World Bank (2012), the MSEs' limited financial access was still a major obstacle that hinders them from establishment of new businesses and expansion of those already existing. Most financial institutions consider MSEs as non-creditworthy because of their small capital investments and even because of their nature of smaller business transactions, thus denying them credit [8]. This, coupled with poor perception leveled against them, has negatively affected their ability to access financial services from the existing formal financial institutions [9]. Furthermore, their

\*Address for Correspondence: Evans Kirui, Department of Applied Economics, Kenyatta University, Nairobi, Kenya, E-mail: Kirui.evans@ku.ac.ke

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inability to financial access particularly from formal financial institutions is more aggravated since majority of them have poor returns from their investments, lack of proper financial records, small capital base, and more often do not have security to secure credit from banks. The debut of mobile money transactions has completely changed the way in which businesses are conducted since offering banking products particularly to those who cannot access formal financial institutions through mobile money services has been fundamental in reaching the unbanked. Moreover, the services are accessible to both the rich and the poor and to almost all the business enterprises. Robust penetration of mobile financial services was seen as an avenue for uplifting the financial performance of MSEs because mobile phones are easily accessible and relatively affordable. Furthermore, mobile financial services have been adopted by majority of MSEs in Kenya and approximately half of them use the platform for either payments, cash receipts or for borrowing through the digital credit platforms such as KCB-Mpesa, M-Shwari, Branch, and Tala [7]. Following its recent innovation in Kenya, utilization of mobile financial services has been rising implying that the majority of Kenyan entrepreneurs are fast adopters of mobile money services innovation. However, majority of the MSEs still faced problems affiliated to the high financial services exclusion and limited access to credit and as a result approximately 2.2 million establishments closed down in the period 2011-16 [7].

## Methodology

### Theoretical model

The firms' decision to utilize mobile money services was derived from the theory of Technology Acceptance Model (TAM). The theory posits that behavioral attitudes and perceived characteristics about a technological innovation are crucial in the process of decision making. From the theory, perceived usefulness of a technology is the degree to which a firm would perceive that using mobile money services would increase the firm's performance. The usefulness of the technology to the MSEs may be realized through technology characteristics such as ease of use which may depend on distance to the nearest mobile money agents and location of the business. Firms will choose to utilize mobile money services ( $u = 1$ ) or not to ( $u = 0$ ) if there is a difference in compared levels of profits from the two options. They will choose to utilize if the utility from utilizing ( $\pi_U$ ) is higher than the utility from non-utilization ( $\pi_N$ ) such that;

$$\pi_U(p, w, u, F^k | u = 1) > \pi_N(p, w, F^k | u = 0) \quad (1)$$

Equation (1) presents a strategy for establishing determinants of utilization of mobile money services by MSEs besides the effects of utilization on their performance.

In establishing the determinants of MSEs utilization of mobile money services, its framework was given as:

$$\Pr(F_i = 1) = \Phi(Z'\beta) \quad (2)$$

Where  $F_i$  is the decision to utilize mobile money,  $Z'$  is an observed vector of firm and institutional characteristics that are thought to influence the performance of MSEs,  $\beta$  is a vector of unknown parameters and  $\Phi$  is the variable's cumulative distribution function of a standard normal.

### Model specification

To analyze the determinants of MSEs utilization of mobile money services, probit model used was specified as in (3)

$$F_i = \beta Z' + \mu \quad (3)$$

Where  $F_i$  is the decision to either utilize mobile money services or not, that is,  $F_i = 1$  is the decision to utilize and  $F_i = 0$  otherwise,  $Z'$  is a vector of the firm, firm-owner and institutional variables and they include; sex of the firm owner, education level of the firm owner, location of the firm, registration status of a firm, group membership of the firm owner, credit access, ownership structure, mobile phone ownership, ownership of radio, number of employees and number of business units.  $\beta$  is a vector of coefficients and  $\mu$  is the random error term.

### Definition and measurement of variables

Variables used to analyze determinants of utilization of mobile money services by MSEs in Kenya is presented in Table 1

## Empirical Results and the Discussions

### Descriptive statistics

The descriptive statistics for both the count and continuous variables used in the analysis are presented in Table 2.

Table 2 shows that from a sample of 21,164 micro and small enterprises 46.06 percent utilized while 54.94 percent did not. The maximum number of business units within the firm was 20 while minimum was zero. The sample mean was 8 business units. For the firms that utilized mobile money, the

**Table 1.** Study variables for utilization of mobile money services on MSEs performance.

Variable	Definition	Measurement
MSE Utilization of Mobile Money Service	Refers to use of mobile money services by a firm to receive payments ,to borrow, and to save money	Measured by a dummy where 1= Firm Utilized, 0=otherwise
Gender of the firm owner	Refers to whether the firm owner is a male of female	Measured by a dummy where, 1= male and 0= female
Firm owner education level	Refers to the highest level of education attained by owner of the firm	Measured by a dummy where 1=No Education 2=Primary, 3=secondary and 4=Tertiary
Number of firm employees	Refers to the number of firm employees (casual or permanent) in the past year	Measured by the total number of employees
Number of business Units	Refers to the number of independent businesses ran within the firm	Measured by the total number of business units
Location type of the firm	Refers to the nature location of the area of operation of the firm, whether fixed or not in the past year	Measured by a dummy where 1=Fixed and 0=Not Fixed
Business Ownership Structure	Refers to whether formal registration of the firm was either sole proprietorship, partnership or as a company in the past year	Measured by a dummy where 1=Sole Proprietor, 2=Partnership, 3=Company
Registration of business	Refers to whether a firm has a valid business permit over the past year where	Measured by a dummy where 1=Yes (Has a Permit)and 0=No (No permit)
Distance to the nearest mobile money agent	Refers to the geographical distance in Kilometers to the nearest mobile money agent	Measured in kilometers
Distance to the nearest bank	It is the geographical distance to the nearest commercial bank	Measured in kilometers
Access to Credit	Refers to whether the firm accessed credit in the past one year	Measured using a dummy where 1=Accessed Credit, 0=Otherwise

Table 2. Descriptive statistics for count and continuous variables.

Variable	Range		Total Sample N= 24,164	Utilized Mobile Money (1) N= 10,888 (45.06%)	Not Utilized Mobile Money (0) N= 13,276 (54.94%)	Difference (1 – 0)
Variable	Min	Max	Mean (S.D)	Mean (S.D)	Mean (S.D)	
Number of Employees	1	50	6.311165 (55.20086)	7.725569 (34.86518)	5.151175 (67.42743)	2.574394***
Number of Business units	0	20	8.007456 (15.77416)	8.674742 (18.28765)	7.464471 (13.36118)	1.210271***

N=Number of observations, S.D=Standard Deviations in parentheses. Asterisks \*\*\*, \*\*, \* denoted the statistical significance at one, 5 and 10 percent confidence levels, respectively.

Table 3. Descriptive statistics for categorical variables.

Variable	Total Sample N=24,164			Utilized Mobile Money (1) N= 10,888 (45.06%)		Not Utilized Mobile Money (0) N= 13,276 (54.94%)		Difference (1 – 0)
	Measurement	N	%	N	%	N	%	
Utilization of mobile Money	Yes	10,888	45.06					
	No	13,276	54.94					
Education level of firm owner	None	2,126	8.80	806	7.40	1,320	9.94	-2.54
	Primary	5,539	22.92	1,998	18.35	3,541	26.67	-8.32
	Secondary	8,396	34.75	3,831	35.19	4,565	34.39	0.08
	Tertiary	8,103	33.53	4,253	39.06	3,850	29.00	10.06
Gender of Business owner	Male	17,655	73.06	8,256	75.83	9,399	70.80	0.03
	Female	6,509	26.94	2,632	24.17	3,877	29.20	-5.03
Location of the Business	Fixed	20,932	86.62	9,431	86.62	11,501	86.63	-0.01
	Not Fixed	3,232	13.38	1,457	13.38	1,775	13.37	0.01
Group Membership	Yes	8,509	35.21	4,302	39.51	4,207	31.69	7.82
	No	15,655	64.79	6,586	60.49	9,069	68.31	7.82
Registration of business	Yes	6,269	25.94	3,457	31.75	2,812	21.18	10.57
	No	17,895	74.06	7,431	68.25	10,464	78.82	10.57
Business Ownership Structure	Sole Proprietor	20,778	85.99	9,153	84.07	11,625	87.56	-3.49
	Partnership	2,479	10.26	1,230	11.30	1,249	9.41	1.89
	Company	907	3.75	505	4.64	402	3.03	1.61
Credit Access	Yes	7,025	29.07	7,245	66.54	3,382	25.47	41.07
	No	17,139	70.93	3,643	33.46	9,894	74.53	-41.07
Mobile Phone	Yes	16,922	70.03	8,484	77.92	8,438	63.56	14.36
	No	12,941	29.97	2,404	22.08	4,838	36.44	-14.36
Radio	Yes	6,039	24.99	3,297	30.28	2,742	20.65	9.63
	No	18,125	75.01	7,591	69.72	10,534	79.35	-9.63

Notes: N=Number of observations, S.D=Standard Deviation (in Parentheses).

mean was 9 business units whereas those that did not utilized have a mean of 7 business units. From the statistics, larger businesses tend to utilize mobile money services than smaller ones. On the number of employees, the minimum was one while maximum was 50 employees. The sample mean was 6 employees. For firms that utilized mobile money the mean was 7 employees while those who did not, the mean number of employees was 5. The difference in mean was statistically significant at one percent level which may imply that businesses with bigger number of employees utilized mobile money services compared to those with less number of employees. From Table 3, 45 percent of the firms utilized mobile money services while 55 percent did not. The observed statistics point to the nature of high uptake of mobile money services in Kenya among the businesses. The difference in proportion as observed in the sample between firms utilizing and those not utilizing mobile money services was sufficient to make utilization of mobile money an appropriate variable for analysis. In terms of education, most of the firm owners had secondary education at 34.7 percent followed by those with tertiary education at 33.5 percent. Firm owners with primary education were 22.9 percent while those with no education were 8.8 percent. In terms of utilization of mobile money services, larger proportions of users were

firm owners with higher levels of education. From the statistics, majority of the firm owners had tertiary education at 39 percent followed by those with secondary education at 35 percent. Those with primary education were 18.35 percent while those with no education were 7.4 percent. With regard to gender, majority of the firm owners were male at 73.06 percent with only 26.9 percent being female. Larger proportions of the firm owners who utilized mobile money services were male at 75.8 percent while females were 24.2 percent. The observed difference in proportion was an indication of the extent of the disparities that arises out of gender issues in terms of ownership and even in establishment of business enterprises. It was also an indication of degree to which women have been excluded from access to mobile financial services. In terms of location of the business, 86.6 percent of them were in a fixed location while those which operated in non-fixed or mobile locations were 13.4 percent. A similar trend was also observed regarding utilization of mobile money services where larger proportions of users were operating in a fixed location at 86.6 percent while non-users in mobile locations were 13.4 percent. There was no difference in proportion with regard to location of the firm between users and non-users of mobile money services.

## Results of determinants of MSE utilization of mobile money services

Heteroskedastic probit (hetprob) model was estimated and its marginal effects computed and the output is presented in Table 4. From Table 4, group membership, gender, credit access, education, mobile phone ownership, radio ownership, registration of business, number of business units and total number of employees were found to have significant effects on utilization of mobile money services by MSEs in Kenya. The other variables, that is, business location and ownership structure of the firm were found to have no significant influence on the use of mobile money services. On membership to a group, the coefficient was positive and statistically significant at one percent. A firm owner who was a member of a group in relation to his/her business was 6.9 percent more likely to utilize mobile money services. This means that a business owner who may belong to a group such as MSE associations, chamber of commerce, merry-go round, men/women association may have found it cheaper in terms of cost and availability to use mobile money services especially for borrowing or saving from the group or any other financial transaction that he/she will benefit from. The development of mobile money services has made such group memberships to be more efficient since one does not need to travel or convene a meeting for them to make contributions. This finding conformed to the study by Mdoe *et al* [10] which established that group participation was more likely to increase MSEs use of mobile telephony through receipt of credit. The marginal effect for the coefficient of gender was positive and statistically significant at one percent level. A firm whose owner was female was 3.8 percent more likely to utilize mobile money services than if the firm was owned by a female. This finding was also consistent with descriptive statistics in Table 4.7 which revealed that 76 percent of firm owners who utilized mobile money services were male. Since majority of the firm owners were male, and given the nature of doing business requires one to be using such services as mobile money more often, being a male firm owner therefore increased the possibility of using mobile money services. Further, nature of duties and roles in the society also works towards excluding women from accessing such services. This is because majority of women are mostly engaged in household duties and hence may not in contact with mobile financial services unlike male counterparts. On credit access, its coefficient was positive and statistically significant at one percent level. A firm that can access credit was 6.5 percent more likely to utilize mobile money services than those which could not access credit. Firms could access credit from various sources ranging from traditional "brick and mortar" financial institutions to the modern digital financial technologies such as mobile money services. Some of the most affordable and easily

available credit facilities are those that can accessed through mobile money services. Therefore credit access, particularly digital credit such as *m-shwari*, *KCB-Mpesa*, *Timiza*, *Tala*, Branch and other platforms are normally accessed via mobile money services. In terms of education, a firm owner with secondary education was 5.6 percent more likely to utilize mobile money services than a firm owner with no education. With tertiary level of education, a firm owner was 8.9 percent more likely to utilize mobile money services than a firm owner with no education. The result of this finding was in harmony with the view that higher levels of education enhances literacy rate which in turn equip one with skills necessary to use such services through operating a mobile phone. This result was also in harmony with the findings in studies by [1,11,12] which found that education also influences mobile money adoption. Regarding mobile phone ownership, its coefficient was positive and statistically significant at one percent level and consistent with the expectation. A firm owner who owned a mobile phone was 12.9 percent more likely to utilize mobile money services than those who did not own. Mobile phone is the platform where mobile money services are accessed and executed. Therefore owning a mobile phone increases the chances of using the same phone to access mobile money services. On radio ownership, the coefficient was statistically significant at one percent. A firm owner with a radio was 8.3 percent more likely to use mobile money services than a firm with none. Radio is a medium of communication and through such services as advertisements and promotions, mobile money services could play a crucial role. It can also provide financial education about financial products which may be accessed through a mobile phone hence encouraging firm owners to use mobile money. Regarding business registration, its coefficient was statistically significant at one percent confidence level. A firm which was registered through licensing and business permit was 5.5 percent, on average, more likely to influence a firm to utilize mobile money services than a firm that was not registered. Registration unlocks the potential of the firm to engage legally in business and even avail more opportunities to increase its scale of operations and in the process such operations may require the use of mobile money services. On the number of business units, its coefficient was statistically significant at one percent level of significance. Increasing the number of business units by one unit will lead to 0.2 percent increase in probability of using mobile money services. Increase in number of units within the firm implies that it is expanding and hence increases its liquidity level. This may necessitate the use of mobile money services particularly when there is need to centralize financial services. Mobile money services may be used particularly in terms customers paying for goods and services. Concerning the number of employees, its coefficient was positive and statistically significant at one

**Table 4.** Marginal effects of determinants of MSE utilization of mobile money services.

Model	Heteroskedastic Probit		
Dependent Variable: 1 if a MSE Utilized Mobile Money Services, 0 otherwise			
Independent Variables	Marginal Effects (dy/dx)	Robust Std. Errors	P-Value
Location (Fixed)	0.0043692	0.013497	0.746
Group Membership (Member)	0.0697165***	0.007225	0.000
Gender (Male)	0.0387454***	0.007302	0.000
Credit Access (Accessed)	0.0659843***	0.0076134	0.000
Education (Primary)	-0.0155456	0.0212013	0.463
Education (Secondary)	0.0561136***	0.0207507	0.007
Education (Tertiary)	0.0896051***	0.0205105	0.000
Mobile Phone Ownership (Owned)	0.1288492***	0.0082716	0.000
Radio (Owned)	0.0838415***	0.0080394	0.000
Ownership Structure (Partnership)	0.0033098	0.0123155	0.788
Ownership Structure (Company)	-0.0254195	0.0261396	0.331
Registration (Registered)	0.0559142***	0.0091135	0.000
Number of Business Units	0.0020862**	0.0008795	0.018
Number of Employees	0.0095086***	0.002097	0.000

Notes: Number of obs.=24,164. Wald chi2 (14)=155.13, Prob>chi2=0.0000. Asterisks \*, \*\*, \*\*\* denotes statistical significance at 10 percent, 5 percent and one percent levels, respectively. No education and Sole proprietorship were the reference category.



percent level. An additional employee in the firm increased the probability of using mobile money services by 0.9 percent. Increase in the number of employees implies that the firm experienced expansion hence the need to use mobile money. An expanded business establishment means increased liquidity need and hence mobile money may be vital in the operations of the firm. The coefficient of the location of business was not statistically significant and therefore it was found to have no influence on utilization of mobile money services by firm in Kenya. This was in contradiction with notion that businesses with fixed location experiences reduced transport and logistics operation and therefore being in a fixed location is likely to enhance profits and therefore expansion which may warrant the use of mobile money services. This finding was also in contradiction with the study by [1] which found significant coefficient of the location of the business. The coefficient of the ownership structure of the business was statistically insignificant and therefore its influence on MSE utilization of mobile money services could not be established.

## Conclusions and Policy Implications

The study concludes that firm owner who is a male, has tertiary education, belongs to a group and owns a mobile phone and a radio are more likely to utilize mobile money services since their coefficients were statistically significant. Moreover, a firm that has more business units and more employees and can access credit is more likely to utilize mobile money services. Firm owners whose business establishments are legally registered are also more likely to utilize mobile money services since the coefficient was statistically significant. On policy implications derived based on the findings of the study for the MSEs, various factors established in the study that determines the uptake of mobile money services by firms in Kenya is an indication of the need by the government through her regulatory authorities and mobile money services providers to design supportive policies that would further scale up the utilization of mobile money services to more financially excluded MSEs in Kenya.

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