ROLE OF MOBILE PHONES ON FINANCIAL INCLUSION IN URBAN INFORMAL SETTLEMENTS IN KENYA: CASE OF KANGEMI SLUMS

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ABSTRACT

Financial inclusion is a situation where financial services are accessible to low income people. Financial inclusion is a prerequisite to economic development as has been echoed by international as well as national bodies. Barriers to financial inclusion include distance, cost of financial services, documentary requirements, lack of trust in financial institutions, lack of money, religious reasons and joint use of financial services. Adoption of mobile phone technologies in financial services can eliminate most of these barriers, if not all. This study therefore looks at the role of mobile phones on financial inclusion in urban informal settlements. Specifically, this study analyzed how ease of access to mobile phone services, financial products offered through mobile phone technology, the quality of mobile phone services and the freedom to choose mobile network operator influence financial inclusion in urban informal settlements. The study area was Kangemi slum, one of the urban informal settlements in Nairobi City County. The study adopted a descriptive research design. The target population was individual residents who reside in Kangemi slums. Probabilistic sampling by simple random sampling was used to arrive at the appropriate sample. The study relied on primary data collected by way of structured questionnaires. Data analysis was conducted using descriptive as well as inferential statistics. The findings of the study indicated that the relationship between freedom to choose, quality of products, availability of basic products and access to mobile services and financial inclusion is positive. The relationship between quality of products, availability of basic products and access to mobile services and financial inclusion is significant at 5% level of significance as while freedom to choose network was not significantly related to financial inclusion. The study recommended that in order to realize an improvement in financial inclusion in the urban sector, the mobile phone providers as well as commercial banks offering their services through mobile phones, should aim at improving availability of basic products, access to mobile services and lastly quality of products in that order. The basic financial products offered through the mobile phones should be customized and be of high quality and also mobile phone networks should be improved to improve access.

 Keywords*: Ease of access, financial inclusion, financial products, Mobile network operator*

INTRODUCTION

Financial inclusion is a situation where financial services are accessible to low income people. Vulnerable groups are usually excluded due to access barriers (Rani, 2006). The evolution of money from physical cash to digital form is redefining financial services as an information business. This, in turn, is generating optimism around the long-term prospect of cashless societies, where most people have access to low-cost, convenient, and broadly available financial services. Research indicates that these digital cash models can increase financial access for unbanked segments by reducing the cost-to-serve for providers and making service more convenient for customers,(Omwansa &Waema, 2014). Branchless innovators who get it right can help accelerate the pace at which financial inclusion happens. The National Financial Access Survey of 2009 shows that 32% of Kenya's bankable population remains totally outside the orbit of financial services and many more being served by the informal financial system, (CBK, 2009). This shows that development agendas cannot be attained without including all people around the world in financial matters and this has made organizations and countries across the world advocate for financial inclusion of all.

The United Nations report (2006) played a significant role in bringing international attention on the issue of financial inclusion. The UN report defines an inclusive financial system as one that provides credit to all bankable individuals and firms; insurance to all insurable individuals and firms; and savings and payment services for everyone. It is commonly argued that the economy as a whole benefits through financial inclusion, (Mohan, 2006). First, it could be an important tool to reduce income inequality in the economy. Low-income individuals are often those not accessing financial services. Once access is provided, these individuals have greater potential to improve their income levels, (World Bank, 2012).The objective of achieving universal financial access by 2020, expressed by the president of the World Bank, is another attempt to recognize the important role of financial inclusion for economic growth and alleviation of poverty,(Honohan, 2008).

Financial inclusion has been an issue for many developing countries. Countries such as India, Brazil, South Africa and Kenya have adopted mobile banking, to give banking access to the unbanked sector. Siddik, Sun, Yanjuan and Kabiraj (2014) inform that in Bangladesh, during last few years, the banking industry has experienced tremendous growth. However, there are concerns that banks have not been able, due to high operating costs, to include vast section of entire population into the fold of basic banking services, especially peoples from informal settlements and rural areas. In Kenya, a product called MPESA was launched in 2007, (Mbiti & Weil, 2011).

Financial inclusion related issues are a subject of growing interest and one of the major socioeconomic challenges on the agendas of international institutions, policymakers, central banks, financial institutions and governments, (Cihak *et al.,* 2012). Financial services are provided more efficiently by the private sector and thus financial institutions are the main agents involved in these processes. However, since lack of use of financial services is mostly due to the presence of market failures, governments should try to mitigate these failures by establishing adequate regulation and policies. It is desirable to ensure that financial services can reach the whole population with appropriate products and access channels. The problem of involuntary financial exclusion requires intervention to address market failures such as asymmetric

information, lack of competition in the markets or insufficient infrastructure. These failures make it difficult population groups, low-income groups or those who have traditionally been more vulnerable, such as women, young people or people who live in informal settlements to use formal financial services. Improving access and building inclusive financial systems is a goal that is relevant to economies at all levels of development. The challenge of better access means making financial services available to all, thereby spreading equality of opportunity and tapping the full potential in an economy. The challenge is greater than ensuring that as many as possible have access to basic financial services. It is just as much about enhancing the quality and reach of the credit, savings, credit, payments and other risk management products in order to facilitate sustained growth and productivity. Broad access to financial services implies absence of price and non-price barriers in the use of financial services. Services need to be available where and when desired, and products need to be tailored to specific needs. Services need to be affordable taking into account the indirect costs incurred by the user such as having to travel long distance to access a bank.

Global Partnership for Financial Inclusion (2012), provides four key things about financial inclusion. First, financial inclusion encompasses four basic financial services: savings, payment, credit, and insurance. Second, these services should be designed in a manner accessible to traditionally excluded groups, including to the poor, women, minority groups and those difficult to reach, for example, those who live in informal settlements. Third, provision of these services ought to meet adequate levels of quality, that is, should be affordable, available, and stable and follow minimum standards of consumer protection. This is a measure of the relevance of the financial services which encompasses the experience of the consumer, his attitudes and opinion towards the financial products available etc. This measure would be used to gauge the nature and depth of the relationship between the financial service provider and the consumer as well as the choices available and their implications. Lastly, these services should be provided by a range of institutions to allow for choice and competition.

STATEMENT OF THE PROBLEM

The level of financial inclusion in African countries is generally very low (Chijioke, 2015). In poorer rural communities, which comprise the bulk of the financially excluded, financial exclusion is mainly due to income-related issues and barriers to accessing formal financial institutions. According to World Bank (2011), Kenya has a population of 43,291,000 with only 42% of the adult population with formal accounts. The percentage of those with debit cards was 30% and only 6% held credit cards. According to the same statistics, only 10% of the adult population obtained loans. In a survey conducted by FinAccess (2009) in Kenya, income-related issues such as a lack of income, irregular income and the inability to pay for formal financial services accounted for most of the income-related challenges that resulted in financial exclusion. Access barriers such as a lack of proper documentation, complex financial products and services, illiteracy and the location of financial institutions were the main reasons why Kenyans were unable to use formal financial institutions. Olang and Okoth (2012) cited the above barriers as prevalent within the informal settlements. Although the country has made significant steps towards financial inclusion, many people in urban informal settlements are still financially excluded due to many constraints. Financial inclusion can benefit a country's economy immensely if these challenges are addressed. To increase access to finance, financial services regulations and infrastructure such as mobile payments will have to be reviewed to accommodate

the country's poor in urban informal settlements. Clamara, Pena and Tuesta (2014) agree that Financial Inclusion is important for sustainable economic growth and the improvement of social well-being. However, Clamara, et al, (2014) observe that how to build inclusive financial systems is a challenging subject on the agendas of researchers, policymakers, regulators and financial institutions. Clamara, et al. lists some barriers to financial inclusion as distance, cost of financial services, documentary requirements (ID, wages, paper work, etc.) and lack of trust in financial institutions, lack of money, religious reasons and joint use of financial services and observes that adoption of mobile phone technologies in financial services can eliminate most of these barriers, if not all.

Studies on the role of mobile telephone technologies on financial inclusion are limited although there is general acknowledgement that technology has revolutionised the way business is done. Nandhi (2012) studied the effects of EKO mobile banking on the savings behaviour and practices of low income users in the metropolis of Delhi, India. World Bank (2014b) in its Financial Inclusion and Capability Survey Report on Mozambique observed that in order to close the identified gap between urban and rural populations in accessing financial services, it is recommended to harness the potential of branchless banking. According to World Bank (2014b), advancing financial inclusion levels in Mozambique will also require a more competitive and diverse financial sector to make products affordable to larger parts of the population. Morawczynski and Miscione (2008) explored trust in mobile banking transactions using the case of M-Pesa in Kenya and observed that this m-banking application facilitates numerous financial services such as checking account balances, making deposits and withdrawals, transferring money and phone credit to other users. Makore (2012) explored the use of mobile banking services by the poor in South Africa. Porteous (2008) finds that the mobile banking solution had limited impact on financial inclusion as the users were not necessarily the unbanked poor but were formally employed residents of urban areas, the banked and the marginally banked. Clearly, none of the above studies has addressed the role of mobile phone technology on financial inclusion in urban informal settlements, hence the motivation for this study.

RESEARCH OBJECTIVES

1. To determine how ease of access to mobile phone services influence financial inclusion in urban informal settlements.
2. To establish how financial products offered through mobile phone technology influence financial inclusion in urban informal settlements.
3. To assess how quality of mobile phone services influence financial inclusion in urban informal settlements.
4. To analyze how the freedom to choose mobile network operator influence financial inclusion in urban informal settlements.

LITERATURE REVIEW

Theoretical Framework
Agency Theory

According to Laudon and Laudon, (1996), agency theory views the company as a link of contracts among self-interested individuals rather than a unified, profit-maximizing entity. It explains the relationship between principal and agent in business. Agency theory is concerned with resolving problems that can exist in agency relationships; that is, between principals and

agents of the principals. The two problems that agency theory addresses are: the problems that arise when the desires or goals of the principal and agent are in conflict, and the principal is unable to verify what the agent is actually doing; and problems that arise when the principal and agent have different attitudes towards risk. Safaricom Limited and MPESA agents have partnered to promote financial inclusion among all people in Kenya, and specifically those in informal settlements such as Kangemi slums. The two are principal and agent respectively and their relationship is explained by the agency theory hence the relevance of the theory to the study.

Technology Acceptance Model

Technology Acceptance Model is taken into account since it has been the only one which has captured the most attention of the Information Systems community, (Venkatesh & Davis, 2000). The Technology Acceptance Model (TAM) is an information system theory that models how users come to accept and use a technology. It is essential for anyone willing to study user acceptance of technology to have an understanding of the Technology Acceptance Model, (Mohammad, 2009). The model suggests that when users are presented with new technology, a number of factors influence their decision about how and when they will use it, (Venkatesh & Bala, 2008). Hence, from this model the usage behavior of mobile subscribers (customers) in using a technology (M-Banking) are predicted to be much dependable on the perceived value of the technology and the perceived ease use of it that will bring forward the intention to use the perceived technology. The theory is hence relevant in explanation of the adoption of the M-Banking technology by mobile phone users. The study findings are made under the assumptions made in the TAM model since it has behavioral element on intention to use/act and be free to act without limitation.

Empirical Review

Financial Inclusion is important for sustainable economic growth and the improvement of social well-being, (Clamara, Pena & Tuesta, 2014). How to build inclusive financial systems is a challenging subject on the agendas of researchers, policymakers, regulators and financial institutions. This is particularly important in developing countries and emerging markets, where banking penetration rates are relatively low. In their study, Clamara et al. (2014) found that loans and mortgages appear to be better drivers for financial inclusion than saving products. Nandhi (2012), studied the effects of EKO mobile banking on the savings behaviour and practices of low income users in the metropolis of Delhi, India. A critical finding is that EKO mobile banking service is valued as a boon for small savers and users who depended on risky informal savings practices. In particular, a high percentage of users save in EKO mobile banking for emergencies. More importantly, it is considered as a robust substitute to many informal savings mechanisms as well as a bank account. Yet, savings behaviour indicated that EKO mobile banking accounts have not dispelled the need for some of the savings mechanisms used earlier because different savings methods were perceived as having their own usefulness and purpose. Contrary to expectations, in addition to making payments and deposits easier and more accessible, EKO mobile money accounts also seem to improve efficiency and regularity of other savings mechanisms. World Bank (2014b), in its Financial Inclusion and Capability Survey Report on Mozambique observed that In order to close the identified gap between urban and rural populations in accessing financial services, it is recommended to harness the potential of branchless banking. Mobile or agent banking can dramatically reduce the costs of delivering financial services outside larger urban centres, in particular in low-density and remote areas with

prohibitively high costs of establishing traditional branch networks, (World Bank, 2014b). Policies facilitating the introduction of these lower-cost technologies, such as the development of a legal framework, can help reach remote locations and rural populations that were previously excluded from financial services. According to World Bank (2014b), advancing financial inclusion levels in Mozambique will also require a more competitive and diverse financial sector to make products affordable to larger parts of the population. Important barriers to account ownership are lack of money, affordability and lack of financial knowledge of financial products and services.

Morawczynski and Miscione (2008), explored trust in mobile banking transactions using the case of MPesa in Kenya and observed that this m-banking application facilitates numerous financial services such as checking account balances, making deposits and withdrawals, transferring money and phone credit to other users. To access these services, individuals must register at one of the retail agent outlets, and deposit cash. This cash is thereafter reflected as e-money in a virtual account that is managed by Safaricom. This is called the non-bank led model of m-banking because the customer has no direct relationship with a bank. After this account is created, and an e-money balance established, all of the aforementioned transactions can be conducted via the mobile phone. To access e-money transferred via M-PESA, the recipient must also visit a retail agent. They provide the agent with identification, verify the transaction number, and convert the e-money balance on their phone into cash. The transferring money option is particularly interesting in this context because it facilitates the transfer of remittances—both domestic and international. In regards to the latter, Safaricom is currently testing the transfer of e-money between Kenya and the UK.

Makore (2012), explored the use of mobile banking services by the poor in South Africa. The study finds that users of the Wizzit mobile bank are mostly the under banked. This study confirms Porteous (2008), initial study of Wizzit which finds that the mobile banking solution had limited impact on financial inclusion as the users were not necessarily the unbanked poor but were formally employed residents of urban areas, the banked and the marginally banked. However, Bångens & Söderberg (2008), argue on who is referred to as poor as the majority of Wizzit clients actually earn less than R1500 (less than 200 USD) per month. Considering these levels of in-come the users of Wizzit identified by Porteous (2008), Bångens & Söderberg (2008), argue that they are not necessarily well off individuals. The study observes that most of the Wizzit users are not necessarily previously unbanked people but constitute the under banked group in financial inclusion. However, in line with Bångens & Söderberg (2008) argument the study finds that users are not necessarily prosperous as most are informally employed, some are formally employed with low paying jobs and others observed in this study are under banked pensioners. The formal banking sector is not meeting the needs of these underserved clients and therefore they seek alternatives like mobile banking that meet their needs. Clamara, et al. (2014), lists some barriers to financial inclusion as distance, cost of financial services, documentary requirements (ID, wages, paper work, etc.), and lack of trust in financial institutions, lack of money, religious reasons and joint use of financial services. Adoption of mobile phone technologies in financial services can eliminate most of these barriers, if not all.

RESEARCH METHODOLOGY

The study adopted a descriptive research design. The study targeted residents of urban informal settlements in Kenya. Specifically, the study targeted residents of Kangemi slums in Westlands Constituency of Nairobi County. The sampling frame of the study comprised of estimates of

clients who visit mpesa outlets, petrol stations, supermarkets and other retail shops, safaricom dealer shop and equity bank within Kangemi. In this research, probability sampling techniques was used to allow each element of the population to have equal chance of being selected. Probability sampling technique allowed the researcher to use cases that have the required information for the study objectives. The sample size of the population was derived from the following formula: (Kothari, 2004)

$$n = \frac{Z^2 PqN}{e^2(N-1) + Z^2 Pq}$$

Where;

n = the desired sample size

Z = normal reduced variable at 0.05 level of significance (z is 1.96)
P = p: population reliability (or frequency estimated for a sample of size n), where p is 0.5 and p + q= 1, q = 1- P
N: size of population
e: margin of error considered, which is 5% for this study.

$$n = \frac{1.96^2 (0.5 \times 0.5 \times 3060)}{0.05^2(3060-1)+1.96^2 (0.5 \times 0.5)} = 152.14 = 153 \text{ respondents}$$

Table 3.2 below shows the sample size.

Table 1: Sample Size

Item	Total	Ratio	Sample
MPESA Agents	1000	5%	50
Petrol Stations	160	5%	8
Supermarkets	600	5%	30
Equity Bank	300	5%	15
Safaricom shop	1000	5%	50
Total			**153**

The study used primary data collected through the use of structured questionnaires.

Quantitative data was analyzed using Statistical Package for Social Sciences (SPSS) version 20 software. Descriptive findings were presented using frequency tables, bar graphs, pie charts and graphs. In order to test the strength of the relationship between the dependent and independent variables, regression coefficients were used. The regression model was of the form:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$$

Where Y represents financial inclusion, X_1, X_2, X_3 and X_4 represents ease of access , available products , quality of products, freedom of choice of MNO and ε is the error term,

RESULTS

Response Rate

The number of questionnaires that were administered was 153. A total of 135 questionnaires were properly filled and returned. The response rate is as presented in Table 2.

Table 2: Response Rate

Response Rate	Frequency	Percent
Returned	135	88.2%
Unreturned	18	11.8%
Total	153	100%

This represented an overall successful response rate of 88.3 % as shown on Table 4.1. This agrees with Kothari (2004) that a response rate of 50% or more is adequate for a descriptive study. Babbie (2004) also asserted that return rates of 50% are acceptable to analyze and publish, 60% is good and 70% is very good. Based on these assertions from renowned scholars 88.3% response rate is adequate for the study.

Pilot Results

The reliability of an instrument refers to its ability to produce consistent and stable measurements. The study conducted a pilot and the results are presented in Table 3.

Table 3: Reliability Test Statistics

Variable	Cronbach's Alpha	Number of items
Access to mobile phone services	0.873	5
Mobile phone financial products	0.727	5
Quality of mobile phone services	0.759	7
Freedom to choose mobile network operator	0.736	4
Financial inclusion	0.705	5

Kothari (2004) explains that reliability can be seen from two sides: reliability (the extent of accuracy) and unreliability (the extent of inaccuracy). The most common reliability coefficient is Cronbach's alpha which estimates internal consistency by determining how all items on a test relate to all other items and to the total test- internal coherence of data. The reliability is expressed as a coefficient between 0 and 1.00. The higher the coefficient, the more reliable is the test. The reliability of this instrument was evaluated through Cronbach Alpha which measures the internal consistency. Cronbach Alpha value is widely used to verify the reliability of the construct. The findings of the study in Table 3 indicated that access to mobile phone services had a coefficient of 0.873, mobile phone financial products had a coefficient of 0.727, Quality of mobile phone services had a coefficient of 0.759, freedom to choose mobile network operator had a coefficient of 0.736 and financial inclusion had a coefficient of 0.705. All variables depicted that the value of Cronbach's Alpha are above value of 0.7 thus the study was reliable

(Kothari, 2004). This represented a high level of reliability and on this basis it was supposed that scales used in this study were reliable to capture the variables.

Demographic Characteristics

This section analyzes the demographic characteristics of the respondents who participated in the study. This section presents the descriptions of the gender of the respondents, age group of the respondents, level of education of the respondents, occupation of the respondents, the mobile network operator which the respondents are registered with and what the respondents mainly use the their mobile phone for.

Gender of the respondents

The study sought to establish the gender composition of the respondents. The results are as presented in Figure 1.
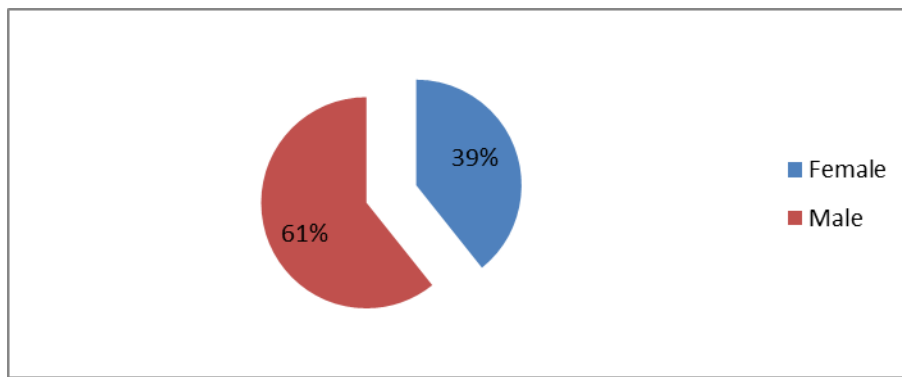

Figure 1: Gender composition of Respondents

The results in Figure 1 indicates that majority of the respondents, 61%, were male. This finding indicates that the gender distribution was above the Constitution of Kenya (2010) threshold of a third, however this did not affect the results of the study.

Age of the respondents

The study also sought to establish the age groups of the respondents. The results are as presented in Figure 2.
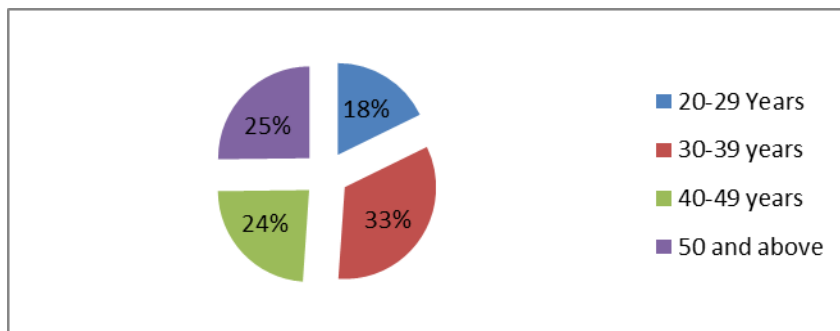

Figure 2: Age of Respondents

The results in Figure 2 indicate that majority, 33%, of the respondents were between the ages of 30 to 39 years of age. The number of respondents who were between 40 to 49 years was 24%

while those who are between 20 to 29 years were 18%. These findings imply that the study considered opinions of respondents from across all age groups above 20 years.

Level of Education of the respondents

The study also sought to establish the level of education of the respondents. The results are as presented in Figure 3.
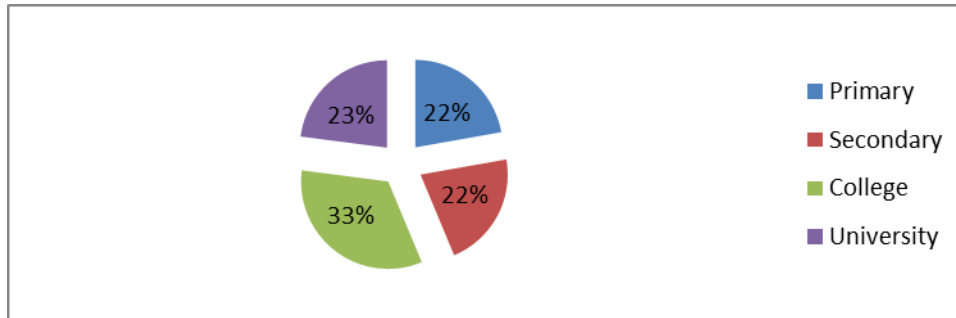

Figure 3: Level of education of the respondents

The study findings in Figure 3 indicate that majority of the respondents, 33%, had college level of education while 23% had University level of education. Those who had primary and secondary level of education were 44%. The findings of the study revealed that the study considered opinions of people across all levels of education. Furthermore, majority of the respondents were educated.

Occupation of the respondents

The study also sought to establish the occupation of the respondents. The results are as presented in Figure 4.
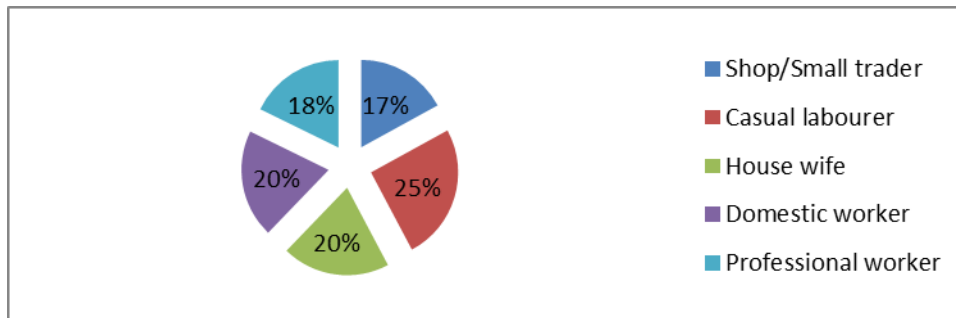

Figure 4: Occupation of the respondents

The findings in Figure 4 indicate that the majority participants in the study were casual laborers who were 25%. The shop traders and professional workers were 17% and 18% respectively while house wives and domestic workers made up 40% of the respondents. These findings imply that the study considered respondents of diverse occupation.

Mobile Network used by the respondents

The study also sought to establish the mobile network used by the respondents. The results are as presented in Figure 5.
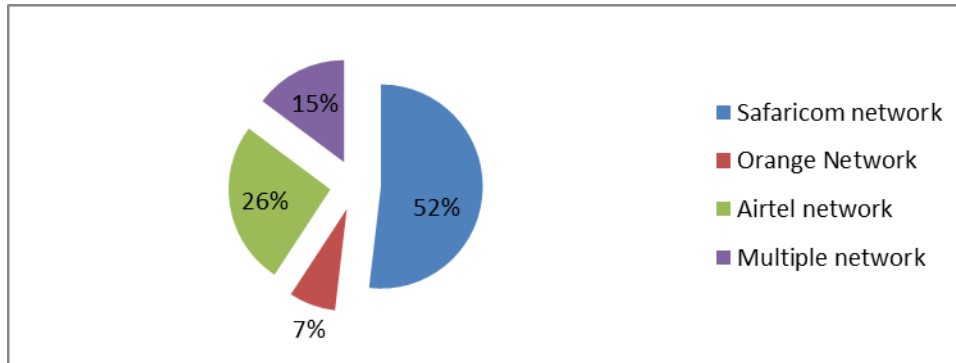
Figure 5: Occupation of the respondents

The findings in Figure 5 indicate that Safaricom network is the most used network as 52% of the respondents have subscribed to it, Airtel is the second most used and lastly orange. The number of respondents who have multiple mobile networks were only 15%.

Use of mobile phones

The study also sought to establish the activities which the respondents mainly use their mobile phones for. The results are as presented in Figure 6.
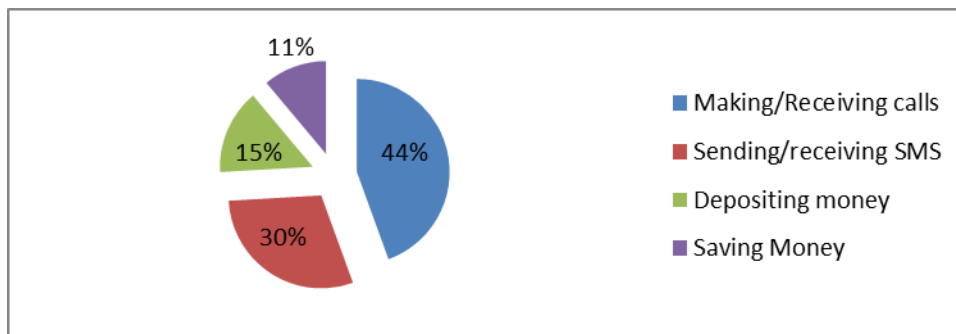

Figure 6: Main use of mobile phones

The findings in Figure 6 indicate that majority of the respondents, 44%, use mobile phones to make and receive calls, 30% use the mobile phones to send and receive SMS while only 26% use the mobile phone to deposit as well as save money. These findings imply that the use of mobile money solely for financial services is not a priority among the respondents.

Ease of access to mobile phone services

The first objective of the study was to determine how ease of access to mobile phone services influence financial inclusion in urban informal settlements. The respondents were asked to rate statements on ease of access to mobile phone services in order of strength starting from strongly disagree to strongly agree. The results are as presented in Table 4. The findings of the study indicated that, 48.8% of the respondents agreed that there are no Price and non-price barriers which hinders access to financial services, 45.2% agreed that the financial services are readily available, and that boosts accessibility while majority of the respondents, 63.7%, agreed that the financial services are affordable, and that boosts accessibility. Those who agreed that the financial services are customized on all phones and that boosts accessibility were 63% and those who agreed that availability of Mobile network boosts accessibility were 55.6%. The mean of 3.50 indicates that respondents agreed on most of the statements regarding ease of access to

mobile phone services and a standard deviation of 1.37 indicates that the variation in the responses was minimal.

Table 4: Ease of access to mobile phone services

	1	2	3	4	5	Mean	Std Dev
There are no Price and non-price barriers which hinders access to financial services	17.00%	13.30%	20.70%	20.70%	28.10%	3.30	1.44
The financial services are readily available and that boosts accessibility	16.30%	15.60%	23.00%	9.60%	35.60%	3.33	1.50
The financial services are affordable and that boosts accessibility	6.70%	12.60%	17.00%	36.30%	27.40%	3.65	1.20
The financial services are customized on all phones and that boosts accessibility	12.60%	11.10%	13.30%	26.70%	36.30%	3.63	1.40
Availability of Mobile network boosts accessibility	9.60%	11.10%	23.70%	19.30%	36.30%	3.61	1.33
Average						**3.50**	**1.37**

The results are consistent with Demirgüç-Kunt and Klapper, (2012) who observed that technology based banking models have tremendous transformational impact since they have the potential to reach clients that are excluded from conventional financial systems.

Financial products offered through mobile phones

The second objective of the study was to establish how financial products offered through mobile phone technology influence financial inclusion in urban informal settlements. The respondents were asked to rate statements on financial products offered through mobile phone technology in order of strength starting from strongly disagree to strongly agree. The results are as presented in Table 5.

Table 5: Financial products offered through mobile phone technology

	1	2	3	4	5	Mean	Std Dev
Saving financial services are readily available on mobile phones	22.20%	20.00%	16.30%	21.50%	20.00%	2.97	1.46
Deposit financial services are readily available on mobile phones	8.10%	9.60%	21.50%	23.00%	37.80%	3.73	1.28
Credit financial services are readily available on mobile phones	3.00%	15.60%	14.80%	38.50%	28.10%	3.73	1.12
Insurance financial services are readily available on mobile phones	2.20%	16.30%	17.00%	37.00%	27.40%	3.71	1.11
Payment services are readily available on mobile phones	5.90%	7.40%	18.50%	28.90%	39.30%	3.88	1.18
Average						**3.60**	**1.23**

The findings in Table 5 indicates that 41.5% of the respondents agreed that saving financial services are readily available on mobile phones , 60.8% agreed that deposit financial services are readily available on mobile phones while 66.6% of the respondents agreed that credit financial services are readily available on mobile phones. Furthermore, majority of the respondents agreed that insurance financial services are readily available on mobile phones and those who agreed that payment services are readily available on mobile phones were 68.2%. The mean of 3.60 indicates that respondents agreed on most of the statements regarding financial products offered through mobile technology and a standard deviation of 1.37 indicates that there was a small variation in the responses. The findings of the current study agree with the findings of a study by Clamara et al. (2014) which indicated that loans and mortgages appear to be better drivers for financial inclusion than saving products. These study findings are consistent with the findings of a study by Morawczynski and Miscione (2008) which found out that m-banking application in Kenya facilitates numerous financial services such as checking account balances, making deposits and withdrawals, transferring money and phone credit to other users.

Quality of mobile phone services

The third objective of the study was to assess how the quality of mobile phone services influences financial inclusion in urban informal settlements. The respondents were asked to rate statements on quality of mobile phone services in order of strength starting from strongly disagree to strongly agree. The results are as presented in Table 6.

Table 6: Quality of mobile phone services

	1	2	3	4	5	Mean	Std Dev
Easy and convenient way than banking halls	8.90%	8.90%	17.00%	24.40%	40.70%	3.79	1.30
Easy to withdraw any time	15.60%	7.40%	11.10%	19.30%	46.70%	3.74	1.49
Offers a safe place to save money anytime	13.30%	14.80%	14.10%	29.60%	28.10%	3.44	1.39
Helps to avoid unnecessary spending	11.90%	9.60%	17.00%	19.30%	42.20%	3.70	1.40
Transactions are fast and quick	11.90%	10.40%	19.30%	14.80%	43.70%	3.68	1.42
Transaction cost is not prohibitive	2.20%	16.30%	17.00%	37.00%	27.40%	3.71	1.11
Mobile network is stable	13.30%	14.80%	14.10%	29.60%	28.10%	3.44	1.39
Average						**3.65**	**1.36**

The study findings in Table 6 indicates that majority of the respondents, 65.1% agreed that the use of mobile phone was easy and convenient way than banking halls, 66.0% agreed that it was easy to withdraw any time while using a mobile phone, 58.5% agreed that transactions are fast and quick and 57.7% of the respondents agreed that mobile network is stable. The mean of 3.65 indicates that respondents agreed on most of the statements regarding quality of mobile phone services and a standard deviation of 1.36 indicates that there was a small variation in the responses. Compared to the findings of a study by Nandhi (2012) which found out that EKO mobile banking service is valued as a boon for small savers and users who depended on risky

informal savings practices, these findings agrees with Nandhi (2012) regarding the quality of financial services through mobile phones.

Freedom to choose Mobile Network Operator

The fourth objective of the study was to analyze how the freedom to choose mobile network operator influence financial inclusion in urban informal settlements. The respondents were asked to rate statements on freedom to choose mobile network operator in order of strength starting from strongly disagree to strongly agree. The results are as presented in Table 7.

Table 7: Freedom to choose mobile network operator

	1	2	3	4	5	Mean	Std Dev
The regulations allow for freedom to choose mobile network operator	5.90%	13.30%	14.80%	38.50%	27.40%	3.68	1.18
Competition among mobile network operators makes it easy to choose among them	17.00%	6.70%	12.60%	23.70%	40.00%	3.63	1.48
Quality of the services of different networks makes it easy to choose among them	5.90%	13.30%	14.80%	40.00%	25.90%	3.67	1.17
Coverage of the different networks makes it easy to choose among them	8.90%	15.60%	10.40%	31.10%	34.10%	3.66	1.33
Average						**3.66**	**1.29**

The results in Table 7 indicates that those who agreed that the regulations allow for freedom to choose mobile network operator were 65.9% while 63.7% agreed that competition among the mobile network operators makes it easy to choose among the mobile operators, 65.9% agreed that quality of the services of different networks makes it easy to choose among them and lastly 65.2% agreed that coverage of the different networks makes it easy to choose among them.

Financial inclusion

The respondents were asked to rate statements on financial inclusion in order of strength starting from strongly disagree to strongly agree. The results are as presented in Table8.

The study findings presented in Table 8 indicates that 68.9% of the respondents agreed that majority of residents of Kangemi readily access banking services through mobile phones, 53.4% also agreed that majority of residents of Kangemi readily access insurance services through mobile phones while 66.6% agreed that majority of residents of Kangemi readily access savings services through mobile phones. The respondents who further agreed that majority of residents of Kangemi readily access credit services mobile phones were 64.4% while those who agreed that majority of residents of Kangemi readily access payment services mobile phones were 68.2%.

Table 8: Financial inclusion

	1	2	3	4	5	Mean	Std Dev
Majority of residents of Kangemi readily access banking services through mobile phones	2.20%	8.10%	20.70%	33.30%	35.60%	3.92	1.04
Majority of residents of Kangemi readily access insurance services through mobile phones	13.30%	14.10%	19.30%	10.40%	43.00%	3.56	1.48
Majority of residents of Kangemi readily access savings services mobile phones	3.00%	15.60%	14.80%	38.50%	28.10%	3.73	1.12
Majority of residents of Kangemi readily access credit services mobile phones	2.20%	16.30%	17.00%	37.00%	27.40%	3.71	1.11
Majority of residents of Kangemi readily access payment services mobile phones	5.90%	7.40%	18.50%	28.90%	39.30%	3.88	1.18
Average						**3.76**	**1.19**

Correlation Analysis

The study sought to establish the association between the study variables. The results are as presented in Table 9.

		Access	Availability of basic products	Quality of products	Freedom to choose network	Financial inclusion
Access	Pearson Correlation	1	0.116	0.144	.420**	.483**
	Sig. (2-tailed)		0.179	0.096	0	0.000
Availability of basic products	Pearson Correlation	0.116	1	0.131	.183*	.352**
	Sig. (2-tailed)	0.179		0.131	0.033	0.000
Quality of products	Pearson Correlation	0.144	0.131	1	.490**	.351**
	Sig. (2-tailed)	0.096	0.131		0.000	0.000
Freedom to choose network	Pearson Correlation	.420**	.183*	.490**	1	.408**
	Sig. (2-tailed)	0.000	0.033	0.000		0.000
Financial inclusion	Pearson Correlation	.483**	.352**	.351**	.408**	1
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	

The study findings indicated in Table 9 indicate that access to mobile financial services, availability of basic products, quality of products and freedom to choose network are all positively and significantly associated with financial inclusion. The association between the variables and financial inclusion was however not strong as shown by beta of 0.483, 0.351, 0.352 and 0.408. The study findings imply that an increase or improvement in any of the predictor variables is associated with an increase or improvement in financial inclusion.

Regression Analysis

The main objective of the study was to examine the role of mobile phones on financial inclusion in urban informal settlements. To establish the relationship, the study used an ordinary least square regression model. The results are as presented. The results in Table 10 represent the model Summary.

Table 10 Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate
.625a	0.391	0.372	0.649

The findings of the study represented in Table 10 revealed that all the four predictor variables (access to mobile financial services, availability of basic products, quality of products and freedom to choose network) are jointly positively associated with financial inclusion as indicated by an R of 0.391. Furthermore, the results also indicate that the joint predictors can explain up to only 37.2% of the changes in financial inclusion and the remaining percentage of 62.8% can be explained by other factors not captured in the current study. Furthermore, the study established the goodness of fit of the model. The results for ANOVA are as presented in Table 4.11.

Table 11: ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Regression	35.148	4	8.787	20.87	.000b
Residual	54.734	130	0.421		
Total	89.881	134			

The results indicated that the F statistic of 8.787 of the model was significant at 5% level of significance as indicated by a P value of 0.000. This means that the model of the relationship between mobile phones and financial inclusion fit well. Lastly, the regression coefficients of the model were established. The significance was tested at 5% level of significance. The results are as presented in Table 12.

Table 12: Regression Coefficients

	B	Std. Error	t	Sig.
(Constant)	0.003	0.466	0.572	0.945
Freedom to choose network operator	0.095	0.088	1.075	0.285
Quality of products	0.216	0.079	2.745	0.007
Availability of basic products	0.416	0.111	3.755	0.000
Access to mobile financial services	0.325	0.064	5.054	0.000

The overall model

This is presented as below;

$Y = 0.03 + 0.095X_1 + 0.216X_2 + 0.416X_3 + 0.325X_4$

Where; X_1= Freedom to choose network operator, X_2= Quality of products, X_3= Availability of basic products and X_4= Access to mobile financial services

The results in Table 12 indicate that all other factors being zero, the level of financial inclusion is 0.003. Furthermore, the model indicates that the relationship between freedom to choose, quality of products, availability of basic products and access to mobile services and financial inclusion is positive as indicated by beta coefficients of 0.095, 0.216, 0.416 and 0.325 respectively. The relationship between quality of products, availability of basic products and access to mobile services and financial inclusion is significant at 5% level of significance as indicated by p value of 0.007, 0.000 and 0.000 respectively while freedom to choose network was not significantly related to financial inclusion as indicated by 0.285. The findings imply that, all other factors held constant, a unit increase in quality of products, availability of basic products and access to mobile services will lead to a unit increase in financial inclusion by   0.216, 0.416 and 0.325 units respectively. Furthermore, the results indicated that in order of contribution, availability of basic products contributed followed by access to mobile services and lastly quality of products. The study findings agreed with the argument by World Bank (2014b), that advancing financial inclusion levels requires a more competitive and diverse financial sector to make products affordable to larger parts of the population. The current study findings indicate that availability of basic products which reflects affordability is critical for financial inclusion.

Conclusion

The study findings indicated that access to mobile financial services, availability of basic products, quality of products and freedom to choose network are all positively and significantly associated with financial inclusion although the association is weak. Further findings indicated that all the four predictor variables (access to mobile financial services, availability of basic products, quality of products and freedom to choose network) are jointly and positively associated with financial inclusion. Regression results indicated that, the relationship between freedom to choose, quality of products, availability of basic products and access to mobile services and financial inclusion is positive. The relationship between quality of products, availability of basic products and access to mobile services and financial inclusion is significant at 5% level of significance as while freedom to choose network was not significantly related to financial inclusion. Lastly, the results indicated that in order of contribution, availability of basic products contributed more to financial inclusion followed by access to mobile services and lastly quality of products.

Recommendations

Based on the study conclusions, the study recommended that in order to realize an improvement in financial inclusion in urban informal settlements, the mobile network providers as well as financial institutions offering their services through mobile phones technology should aim at improving availability of basic products and access to mobile services and lastly enhancing the quality of products in that order. The basic financial products offered through the mobile phones should be customized. The companies should come up with strategies including improving of

networks so that there is an improvement in access and lastly, an improvement in the quality of the products should be re-examined.

Ease of access to mobile phone services

With regards to ease of access, the study recognizes how affordability of mobile phones boosts accessibility. The government should provide appropriate incentives to the mobile phone manufacturers or importers with a view of ensuring that the mobile phones are affordable without compromising on their quality. Reducing the cost-to-serve for providers and making service more convenient for customers (Omwansa &Waema, 2014) is critical for promoting financial inclusion among the unbanked poor. Mobile phone manufacturers should improve infrastructure of mobile phones to enhance customization of financial services on all phones as this will go a long way in boosting accessibility. Also, mobile network operators (MNOs) should boost mobile network availability in urban informal settlements to promote financial inclusion in these areas to enhance access. Once access is improved, residents in these settlements will have greater potential to improve their income levels (World Bank, 2012) and will go a long way in helping to achieve universal financial access by 2020. It is notable that financial inclusion plays a critical role for economic growth and alleviation of poverty (Honohan, 2008).

Financial products offered through mobile phone technology

Findings of the study revealed unsatisfied demand in terms of financial products offered through the mobile phone technology. This is an indicator that financial institutions are yet to reach a majority of urban informal settlers with savings products. There is therefore an opportunity for financial institutions to partner with mobile network operators in the marketing and offering of most financial products including but not limited to savings, credit, deposits and payments services. In supporting the above position, this study recommends to the policy makers to ensure that all the four basic financial services are offered to the residents of urban informal settlements at the minimum.

Quality of mobile phone services

Provision of financial services ought to meet adequate levels of quality, that is, should be affordable, available, and stable and follow minimum standards of consumer protection. However, most residents of urban informal settlements rated quality of mobile phone services as the third most critical in terms of contribution to financial inclusion to residents in those settlements. This implies that residents of urban informal settlements considered other variables as most critical compared to quality of mobile phone services. Most residents were not satisfied with the quality of mobile phone services in terms of ease of use of mobile phones, convenience, ease of withdrawing any time using a mobile phone, time taken to transact and stability of the mobile network. This study recommends that service level agreements between MNOs and financial institutions should be regularly reviewed with a view to continuously improve on the quality of the mobile phone financial services provided to residents of urban informal settlements so as to promote financial inclusion.

Freedom to choose mobile network operator

From the regression results, most residents in urban informal settlements did not mind about the MNO to use. This study encourages policy makers to review the regulations so as to allow for more freedom to choose mobile network operator. Further, these regulations should provide for some minimum level of competency of each mobile network operator while leaving room for quality differentiation so the residents in urban informal settlements may find it easy to choose

among the mobile operators. Mobile Network Operators should boost their network coverage for the informal urban settlements. Financial services should be provided by a range of institutions to allow for choice and competition.

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