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DETERMINANTS OF FINANCIAL INCLUSION IN KENYA'S URBAN INFORMAL SETTLEMENTS: A CASE STUDY OF MATHARE IN NAIROBI COUNTY

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Abstract

Kenya has made remarkable progress in championing financial inclusion. Despite this progress, full financial inclusion has not been realized in Kenya. Reports from Kenya National Bureau of Statistics and Society for International development in 2013 showed that about 45% of the country lives below the poverty line. Most affected are the urban informal settlements dwellers who are about 75% of urban population. Financial access has been cited as an important tool in fighting poverty. The study was conducted on 27,812 household heads residents of the slums areas with a sample size of 379 households' heads. The main findings of the research were that financial education, income level and savings are significant determinants of financial inclusion for urban informal settlements in Kenya at ρ=0.05. Infrastructural access is however an insignificant determinant at ρ=0.05. Results showed that the higher the level of education, the higher the possibility of being financially included. Also the more an individual was informed and trained about financial services and products, the higher were their chances of being included. This implies that financial services providers should promote financial education to improve financial access. Income level is also a significant determinant and empirical evidence indicated that increased income level could help reduce poverty and inequality. Infrastructural access has significant influence on financial inclusion and the government should improve access to physical amenities to reduce exclusion. Savings culture also has a significant role in influencing financial access but was hampered by inadequate income. Empirical evidence from the research shows that building financially inclusive urban informal settlements requires reducing income inequality, promoting financial literacy, improved access to physical infrastructural amenities and promoting a saving culture. To promote financial inclusion of informal settlements, this research recommends: massive campaigns by financial service providers to promote financial education; increase income levels through more economic opportunities created by increasing access to credit to promote employment creation and boost business ventures; the government and financial services providers should provide physical infrastructure and amenities to ease access of financial services.

Keywords: *Financial education, Financial Inclusion, Urban Informal Settlements*

Introduction

The Kenyan banking sector can be termed as a very important catalyst to economic growth of the country. Nevertheless, the World Bank in 2014 estimated that there are about 2.5 billion individuals in the world without an account in the bank (Kenya Bankers Association, 2014). Data from Global Findex in 2014 revealed that only 50% of individuals above 15 years (termed as adults) had accounts in formal financial institutions worldwide. However, ownership of these accounts varies notably between developing and developed economies. The rate of bank penetration in developing nations is way below average.

Mahmood and Sahai in 2011 noted that regionally in Africa only 20% of adults have bank accounts while in Latin America only 39%. Signh and Tandon (2012) indicated that half of the population in India living in poverty are excluded from the mainstream banking services. In Kenya, the National Financial Access Survey conducted in 2009 indicated that 32% of the population that is bankable could not be reached by financial services. CBK’s report in 2009 showed that most of this population is served by the informal sector. Development agendas are unattainable without an inclusive financial system and that is why most organizations and groups advocate for financial inclusion.

Financial inclusion results into financial liberalization, which is a major financial sector development goal for most countries. Kaminsky and Schmukler (2002), argue that financial liberalization aids in improving financial systems’ functioning, increases funds’ availability as well as facilitating risk diversification across countries. Mishkin (2001) contributed to this by saying that liberalization promotes accountability and transparency, reduces moral hazard and adverse selection while eradicating financial markets’ liquidity problems. Moreover, global capital markets have power to discipline policy makers who attempt to exploit non-liberalized domestic financial markets. Furthermore, Bekaert et al., (2001) argued that liberalization leads to financial development, which triggers economic growth. This was supported by evidence that liberalization or deregulation results to increased rate of output growth.

The African banking system is said to be less inclusive compared to that of other countries (Beck & Cull, 2015). Data from middle-income echelon countries indicate that only 21% of their firms have a credit line and only 16.5% of the population have an account in formal institutions for Africa’s middle-income states. Contrary to these figures, median-income non-Africa states reported 43% line of credit in firms and 21% of the population have accounts with financial institutions that are formal. Mlachila et al., (2013) stated that development of the financial sector contributed to an improvement in the process of growth, however, financial services seem to cluster within major urban settlements. Current evolutions could enhance or transform the issue of financial inclusion all over Africa especially recent mobile banking’ emergence as well as increase in economic growth of most countries.

Kenya has been at the forefront in promoting the global agenda of financial inclusion. There have been very many reforms in the financial sector aimed at promoting financial inclusion since 2007. Some of these reforms such as introduction of agency and mobile banking have revolutionized the country’s financial sector (CBK, 2014). The Kenyan government not only advocates for inclusiveness at policy level, but has also established a kitty for vulnerable people groups, namely; disabled people, youths and women. The youth and women fund which have been in existence for about ten years were the first step by the government to promote financial inclusion. Another kitty was launched in 2013 dabbed as Uwezo Fund and 6 billion shillings were set aside for the same groups (women, youths and people living with disabilities). These funds are meant to promote economic and social capability of these target groups.

M-transfer services have enabled financial transactions through use of mobile phones. This platform enables cash deposits and withdrawals from accounts accessible through mobile phones. The most prominent of these platforms is the M-pesa system in Kenya. A mobile service provider called Safaricom launched this platform in 2007. Since its launching, it has over 19 million registered subscribers. The service is said to have reduced the costs of money transfers as well as informal banking (Mbiti and Weil, 2011).

Research indicates that the main barriers to financial inclusion are; lack of proper documentation, use of informal financial services due to inaccessibility of formal financial services, financial illiteracy or low levels of education, age, gender, lack of income, negative behavioral attitudes or perceptions, and unemployment. The ownership of formal accounts for saving or credit accessibility also influences financial inclusion (Zins and Weill, 2016).

Poverty in Kenya is estimated at 45%. 33% of Kenyan's living in the urban areas are said to be living below the poverty line while about 50% living in rural areas live below poverty line (KNBS and SID, 2013). About 60% to 80% of urban residents dwell in informal settlements in Kenya (Amendah et al., 2014). Nairobi has the highest rates of growth rates annually compared to other African cities. 75% of the population growth in urban centers is accommodated in informal settlements. Informal settlements in the capital cover only 5% of the total land area but carry more than half the population in the city (Cruz et al., 2005). Nairobi employs about 25% of Kenya's population and 43% of urban areas settlers. It generates about 45% of the country's GDP and therefore a major contributor to the country's economy. It is also the gate to Eastern, Southern and Central Africa. Mathare is one of the major slums found in Kenya's capital, Nairobi. This dwelling has myriad social-economic challenges ranging from diseases, crime, unemployment and poverty. Lack of employment for most informal settlement dwellers result into them engaging in crime to survive (Mwelu, 2013). One of the most unguarded aspect of slum living is unemployment. Underemployment, unemployment, few economic initiatives and informal jobs remain to be the available scarce options for slum dwellers (UNHABITAT, 2014). Given these and many other challenges, this research seeks to explore factors that influence financial inclusion of urban informal in Kenya with a particular reference to residents of Nairobi's Mathare slums.

Problem of Study and Focus

Many studies on factors influencing financial inclusion have been done. However, these researches are not exhaustive given that financial inclusion is in formative stages in most counties and new developments as well as changes emerge quotidian. For instance, Boit (2015) explored factors influencing financial inclusion in rural Kenya: a case study of Kenya commercial bank outlets in Marakwet west subcounty. However, the current research explores financial inclusion for people living in Kenyan urban informal settlements of Mathare. Ignacio, (2009) cited that accessing the unbanked and areas has been thwarted by myriad challenges such as infrastructural inaccessibility and harsh weather conditions. Additionally, only few banking or financial institutions are willing to venture in these areas given that some of these areas have fewer people and therefore the institutions might not break even. Wambua and Datche (2013) indicated that financial inclusion plays an unassailable role in bettering the lives of farmers, pastoralists, rural businesspeople as well as other vulnerable clusters. Kenya National Bureau of Statistics and Society for International Development (2013) indicated that highest percentage of urban settlement dwellers live in slums and informal settlements. Nairobi informal settlements are sited to be among the highest poverty-stricken areas. This research therefore seeks to explore what are the factors influencing financial inclusion for the Kenyan urban informal settlements with a particular reference to Mathare within Nairobi County.

General Objective

The general objective was determining the factors influencing financial inclusion for the Kenya's urban informal settlements

Specific Objectives

1. To explore the extent to which financial education of residents of urban informal settlements affects financial inclusion in Kenya.
2. To investigate the extent to which urban informal settlements residents' level of income affects financial inclusion in Kenya.
3. To explore the extent to which urban informal settlements residents' access to infrastructure affects financial inclusion in Kenya.
4. To investigate the extent to which urban informal settlements residents' savings culture affects financial inclusion in Kenya.

Conceptual framework

Independent variables **Dependent Variables**

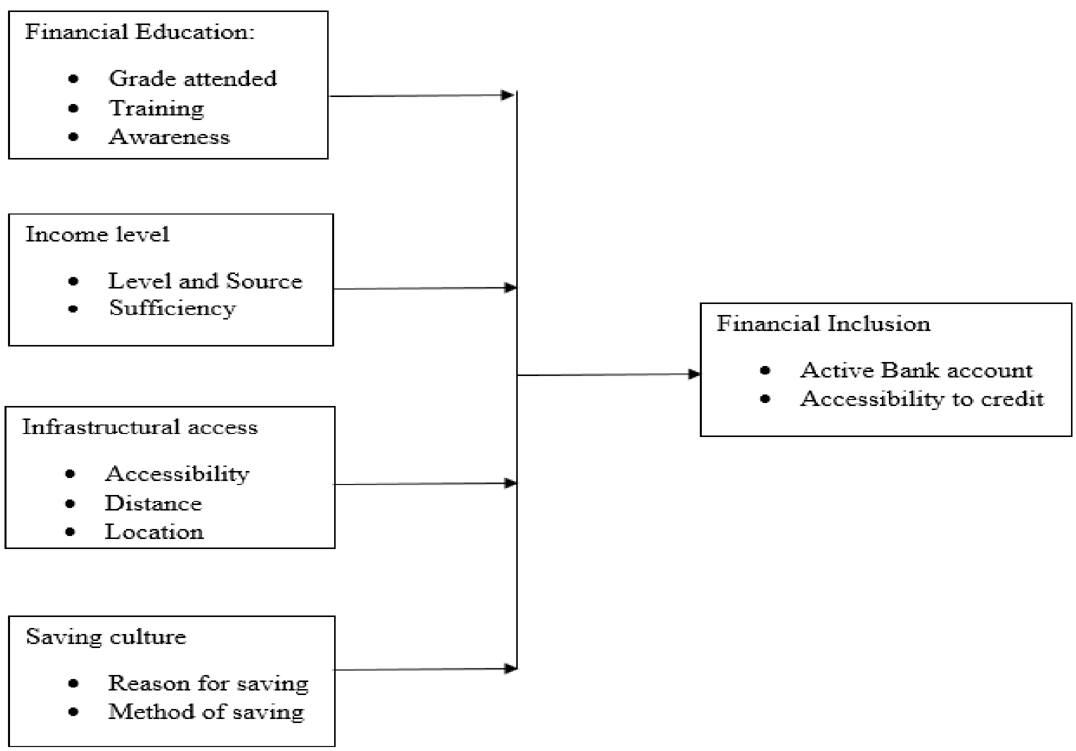

Fig. 1 ***Conceptual framework***

Research Methodology

The study applied a survey research design. The study was conducted on 27,812 household heads residents of the slums areas with a sample size of 379 households' heads The study used both primary and secondary data collected using questionnaires. Data was analyzed using descriptive and inferential statistics. Descriptive statistics involved the use of frequencies, mean, mode, median and standard deviation. Inferential statistics involved the use of regression analysis and ANOVA to estimate the relationships of the variables under study. Analysis of data was done using multiple regressions where the dependent variable Y is defined as:

$Y_i=a_0+a_1X_1+a_2X_2+\ldots +a_nX_n +\varepsilon$

Where X_1, X_2 and X_n are the independent variables, a_n, a_2, and a_1, are the coefficient variables and a_0 is the constant while ε is the error term in tandem with the classical OLS assumptions. Y_i is the individual financial inclusion indicator namely: ownership of active bank account and accessibility to credit. X_{js} are the individual independent variable indicators. The overall model can be precisely stated as:

$Y_i=a_0+a_1X_1+a_2X_2+ a_3X_3+a_nX_n +\varepsilon$

Where X_1, X_2, X_3 and X_4 are financial education, income level, infrastructural access and saving culture respectively and they represent the independent variables. Y is financial inclusion which is the dependent variable.

Findings and Discussions

Financial Inclusion Indicators in Urban Informal Settlements

Financial inclusion is the dependent variable for the research which explores the determinants of financial inclusion of the urban informal settlements in Kenya. Financial inclusion is hypothesized to be promoted through ownership of active bank accounts, access to credit and ease, as well as motive for borrowing. The rate of financial inclusion was measured using two main indicators namely: active bank accounts, and credit accessibility. The residents were presented with statements concerning financial inclusion where they were to state whether one had an active bank account or not and the extent to which they agreed with savings and accessibility to credit statements. The scale used was 1 if one had an active bank account or had accessed credit in the last 12 twelve months and 0 otherwise: 5-Strongly Agree, 4-Agree, 3= Neutral, 2-Disagree and 1=Strongly Disagree for accessibility to credit likert scale questions.

To measure financial inclusion, the residents were asked whether they owned an active bank account and whether they could easily access credit as well as what was their motive for borrowing. The results are shown below in table 1 below.

Table1: Active bank accounts

	Frequency	Percent
No	174	56
Yes	138	44
Total	312	100

56% of the respondents did not have an active bank account while only 44% had active bank accounts. Only 37% of the respondents had accessed credit from a formal financial institution for the last year as shown in table 2 below.

Table 2: Accessed credit in the last 12 months from a formal financial institution

	Frequency	Percent
No	198	63
Yes	114	37
Total	312	100

Most individuals strongly disagreed (38%) with the statement that they could easily access credit from formal financial institutions. A very small proportion seemed to have easy access to credit at 8% and 2 % as shown in the table 3 below.

Table 3: Ease of access to credit

	Frequency	Percent
Strongly disagree	120	38
Disagree	72	23
Neutral	90	29
Agree	24	8
Strongly agree	6	2
Total	312	100

To understand the credit behavior of urban informal settlement dwellers, four main questions are asked focusing on the motivation for acquiring a loan. The four motivations include, 'paying school fees', 'medical expenses' and 'purchase property example given as land, house or apartment.' It was observed that most individuals borrowed to pay medical expenses and to pay school fees at 42% and 31% respectively. There was a small difference for individuals borrowing for purchase of property and for investing in private pension at 14% and 13% respectively as shown in table 4 below.

Table 4: Reason for borrowing

	Frequency	Percent
Property	42	14
Private pension (retirement)	42	13
Education school fees	96	31
medical purpose	132	42
Total	312	100

Financial Education

The extent to which financial education of the residents of urban informal settlements influence their financial inclusion is the first objective of the study. The residents were asked the rate at which they disagreed or agreed with statements of general financial education in their region. The responses were evaluated on a 5-likert scale given as: 5-Strongly Agree, 4-Agree, 3= Neutral, 2-Disagree and 1=Strongly Disagree. The results of the analysis are shown in table 5 below.

Table 5: Financial Education

	N	Minimum	Maximum	Mean	Std. Deviation
Information on various financial services	312	1	5	3	1.302
Promotion activities about available financial services	312	1	4	2	.901
Training on use and access of financial services	312	1	3	2	.736
informing others on available financial services	312	1	5	3	1.444
ease in operation of mobile and bank accounts	312	1	5	3	1.428
Valid N (listwise)	312				

From the table it can be seen that most individuals were undecided (neutral, mean=3 and SD=1.302) when asked how well they were informed about financial provided in their region. The residents disagreed (mean=2 and SD=0.901) that there were informing about financial services within the region. Additionally, most people disagreed that there was training on use and access of financial services (M=2 and SD= 0.736). Most people were undecided (neutral, M=3 and SD=1.444) in terms of informing others on the use and availability of financial services as well as ease in operation of bank and mobile accounts.

The residents were further requested to rate the extent to which financial education was availed to them and the results are as shown in figure 2 below. 162 individuals strongly disagreed that there had been frequent trainings and awareness creation by financial services providers while 144 disagreed. Only 6 residents were undecided on this issue. This implies that financial services providers rarely conduct training or inform urban informal settlements about financial services. These results agreed with the research conducted by Singh and Tandon in 2012 which established that lack of banking services information affected the financial inclusion of rural or informal settlements.

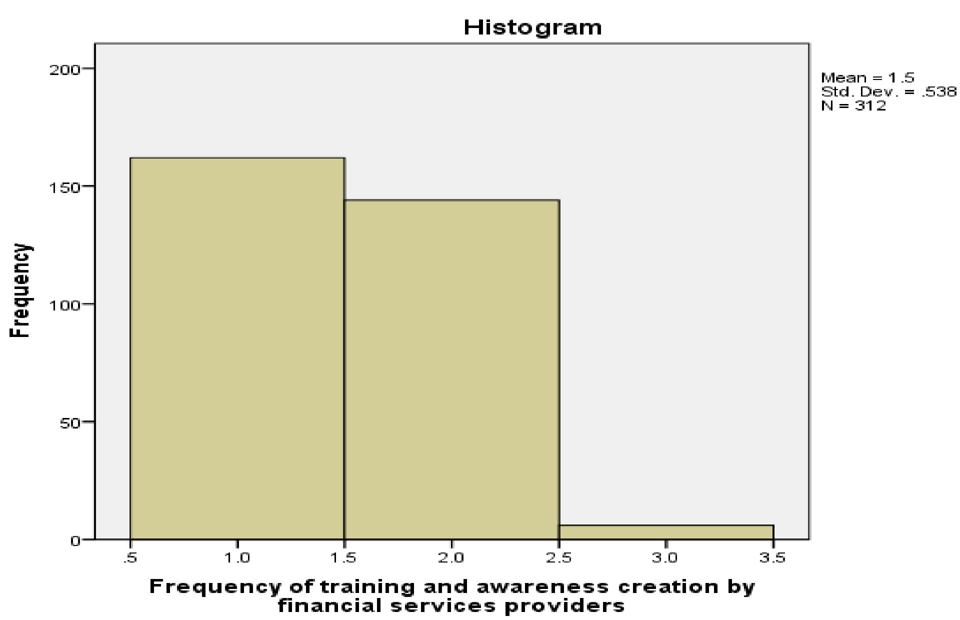

Figure 2 ***Frequency of training and awareness creation by financial services providers***

The research further enquired about the residents' ability to share information with others about use, access and availability of financial service without referring them to experts and the results are as illustrated in figure 3 below.

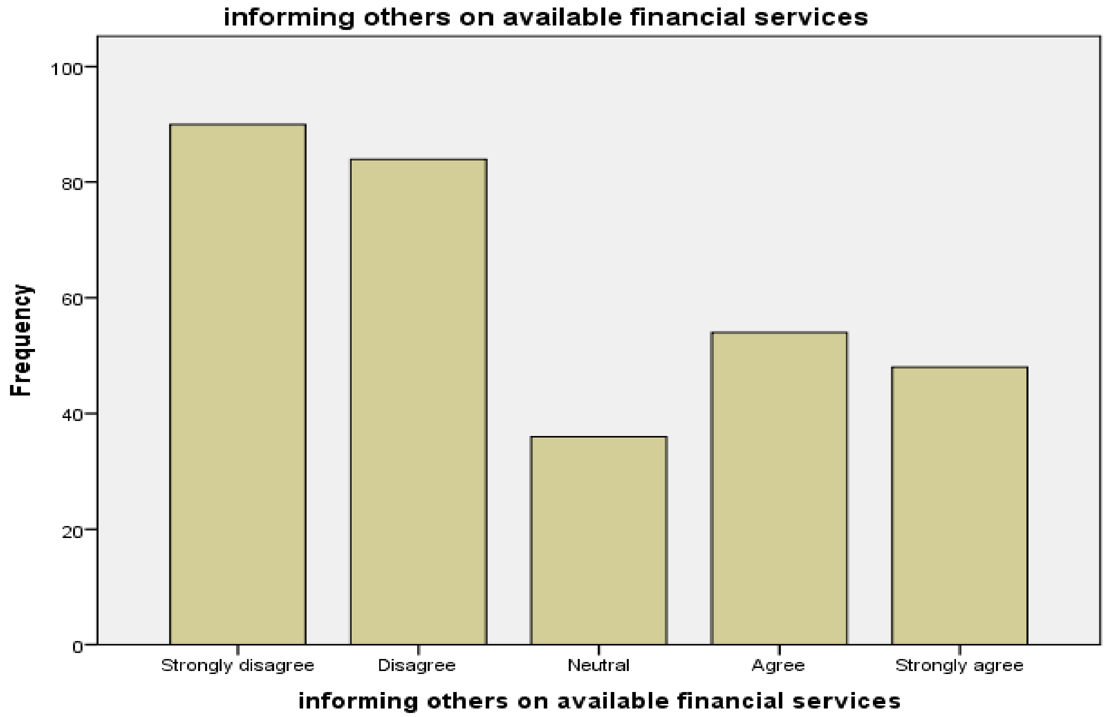

Figure 3: ***informing others on available financial services***

There seems to be a general lack of awareness amongst residents and this translates to inability to adequately share information with others available financial services. 90 (28.8%) and 84 (26.9%) of the individuals strongly disagree and disagree to the statement of concern respectively. A variable proportion of 17.3% and 15.4 % agreed and strongly agreed with the above of concern respectively. This implies that most individuals could not share financial services information with ease. The above results illustrate a wide gap on general financial education for most residents of Mathare slums.

Effect of Financial Education on Financial Inclusion

The findings show that financial education indicators have significant effects on financial inclusion at ρ=0.05. The only insignificant financial education factors as determinants of financial inclusion are training on use and access of financial services in ownership of active bank accounts at ρ=0.528. Financial education also has a significant effect on accessibility to formal credit ρ=0.05. However, for this indicator of financial inclusion promotion activities about available financial services and training on use and access of financial services are insignificant with ρ values of 0.388 and 0.993 respectively. Training on access and use of financial services is therefore an insignificant financial education indicator of financial inclusion. Grade attended and information sharing with others have a positive effect on financial inclusion implying that the more learned and aware one is of financial services, the higher their chances of being financially included. This calls for financial services providers to promote public education and peer to peer financial information sharing to promote financial inclusion and reach the unbanked. There is a positive relationship between education and all the indicators of

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financial inclusion. It is observed that there are significantly positive coefficients for tertiary college and university education for all the determinants of financial inclusion, with higher coefficients being observed on the latter one. It is imperative that the more educated an individual is the higher the likelihood of being financially included. These results are similar to Zin and Weill, (2016).

Infrastructural Access

The third objective of the study was investigating the extent to which access to infrastructure affected financial inclusion of urban informal settlement residents in Kenya. The research incorporated several questions using both ordinal and nominal measurement scales. The residents were first asked how far or close financial services were from their residence. The responses were as shown in the table 6 below.

Table 6*: Distance between service providers*

	Frequency	Percent
Far (more than 5kms)	138	44
close (less than 1km	174	56
Total	312	100

56% (174) household heads in Mathare perceived financial service providers to be close to each other while only 44% (138) thought otherwise.

Additionally, the residents were asked to state the spread of the financial service providers within the region and whether they were concentrated in one area or distributed. Figure 4 below showed the response. Most residents 73% perceived financial services to be evenly distributed while 27% considered the services to be concentrated in one area. This relates to the above statement where, individuals who are close to financial services are in regions where the services are evenly distributed in Mathare slums.

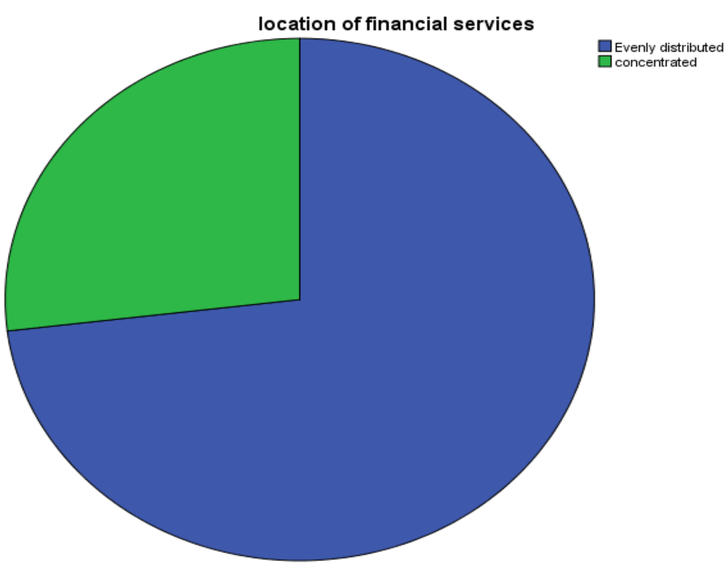

Figure 4: ***location of financial services***

The resident perceptions of infrastructural availability, convenience and its influence on financial inclusion were sought. The responses were on a likert scale as shown in table 7 below.

Table 7: Infrastructure Access

	N	Minimum	Maximum	Mean	Std. Deviation
access to infrastructure and growth of businesses	312	3	5	4	.876
Government participation in enabling access to financial services	312	1	2	2	.487
Advantage of easing access of financial services to residents compared to banking transactions	312	3	5	4	.659
Importance of branding in increasing access to financial services	312	1	5	3	.811
Importance proper function of financial services providers shops	312	1	4	3	.622
effects of increased financial access in transacting formally	312	2	5	4	.796
Valid N (listwise)	312				

Most individuals agreed that access to physical infrastructure led to the growth of their business (M= 4 and SD= 0.876). Most residents also agreed that establishment of easily accessible financial services minimized transaction costs of time and transport to formal financial institutions (M=4 and SD=0.659). There was also a mutual agreement that the presence of easily accessible financial services providers increased the need to engage formal financial services (M=4 and SD=0.796). The residents were undecided on whether branding and presence of proper functioning financial service providers played a critical role in creating customer confidence or enhancing customer satisfaction (M=3 & 3 and SD=0.811 & 0.622 respectively). Nevertheless, most individuals disagreed with the statement that the government provided the necessary infrastructure for growth and expansion of financial services accessibility (M=2 and SD=0.487).

Effect of Infrastructural Access on Financial Inclusion

Access to infrastructure has a significant effect in enhancing financial inclusion at $\rho=0.05$. Access to infrastructure, government participation, proper functioning financial services and ease access to financial services are significant indicators of financial inclusion. However, distance between financial services providers, location of financial services and branding are insignificant determinants of financial inclusion at $\rho=0.05$.There is a positive correlation effect between access to infrastructure and financial inclusion of urban informal settlements (r=0.743) as analysis shows. This concurs with a report by Ministry of Foreign Affairs of Netherlands on the importance of financial infrastructure in enhancing access to financial services. The report sighted that access to financial services is a prerequisite for economic development that benefits everyone. Access to infrastructure has a positive effect on access to credit as indicated by positive coefficients of location (0.061), impact of access to infrastructure on business growth (0.052) and branding (0.104). The negative coefficient on government participation in enhancing access to financial services emphasizes the importance of the private sector in enhancing financial sector deepening. It is easier for individuals to access credit when private sector is at play than when this is left to the public sector. Whether an individual saves or not and whether there are barriers to saving is insignificant in determining access to formal credit.

Income Level

The second objective of the study was investigating the extent to which urban informal settlements residents' level of income affects financial inclusion in Kenya. This section applies both ordinal and nominal measurement scale. 5-Likert scale as used in the other objectives is also employed in this section. The results of the analysis are as shown in figure 5 below.

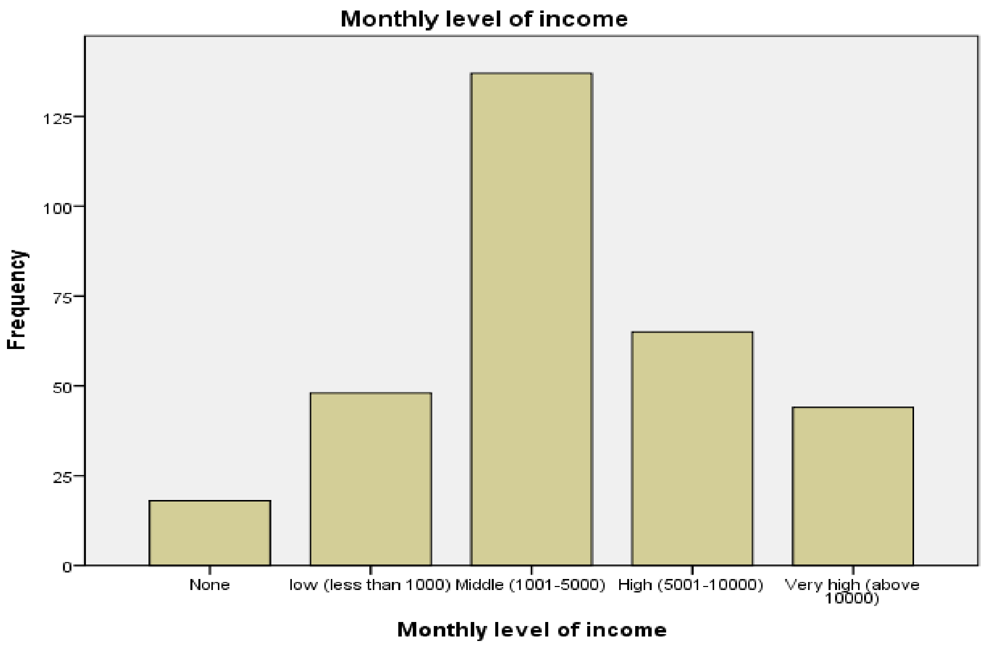

*Figure 5: **Monthly level of income***

Most residents of Mathare slums earn middle (137) and high income (65) as per the clusters given in the research with the highest number earning middle level (1001-5000). A very small proportion of the population earns nothing (18=6%). The number earning very high and low income is almost similar at 14% and 15% respectively. 6 individuals supported by their families and relatives did not term that as income as will be seen in the table 8.

The main source of income is in business (36%) followed by farming (31%). The results are shown in table 8 below.

Table 8: Source of income

	Frequency	Percent
None	12	4
Family	42	14
Farming	96	30
Business ventures	114	36
Employment	48	15
Total	312	100

There was an overwhelming disagreement with the statement that most individuals could comfortably live on the monthly income level as shown below in table 9. Those that strongly disagreed were 50% while those disagreed were 44% while 6% were undecided.

Table 9: Income sufficiency

	Frequency	Percent
Strongly disagree	156	50
Disagree	138	44
Neutral	18	6
Total	312	100

Effect of Income level on Financial Inclusion

Income level has a positive effect on financial inclusion (r=0.585 for access to credit and r= 0.744 for active bank accounts). Income as a variable is a significant determinant of financial inclusion at ρ=0.05. However, some income variables have insignificant effect on individual financial inclusion indicators. For instance, source of income is insignificant in determining the ownership of an active bank account and ability to access credit at ρ=0.541 and ρ=0.376 respectively. This implies that the source of income does not matter when it comes to financial inclusion as long as one has income. These results concur with the findings of Park and Mercado (2015) which showed that per capita income significantly affected financial inclusion in developing Asia. This in turn reduced income inequality and poverty.

Savings culture

The fourth objective of the research was investigating the extent to which urban informal settlements residents' savings ratio affected financial inclusion in Kenya. This section gives a broad overview on the indicators of financial inclusion in Kenyan urban informal settlements. Focus is directed on saving behavior which is examined by considering several questions highlighted in the questionnaire such as the main reason for saving and how most income is spent after being saved as well as barriers to savings. The residents were asked whether they save and the responses are shown in table below.

Table 10: Individual savings

	Frequency	Percent
No	78	25
Yes	234	75
Total	312	100

75% (234) of the household heads said that they saved part of the income earned while 25% (78) said they did not necessarily save but at times set aside some money.

Further, the research enquired the main reason for saving for those who saved and analysis is as presented in the figure 6 below. Most individuals saved for personal reasons (156= 50%) and emergency (132) reasons while very few saved for retirement (24). Saving for old age or retirement seems to be the least of the worries for most urban informal settlement dwellers.

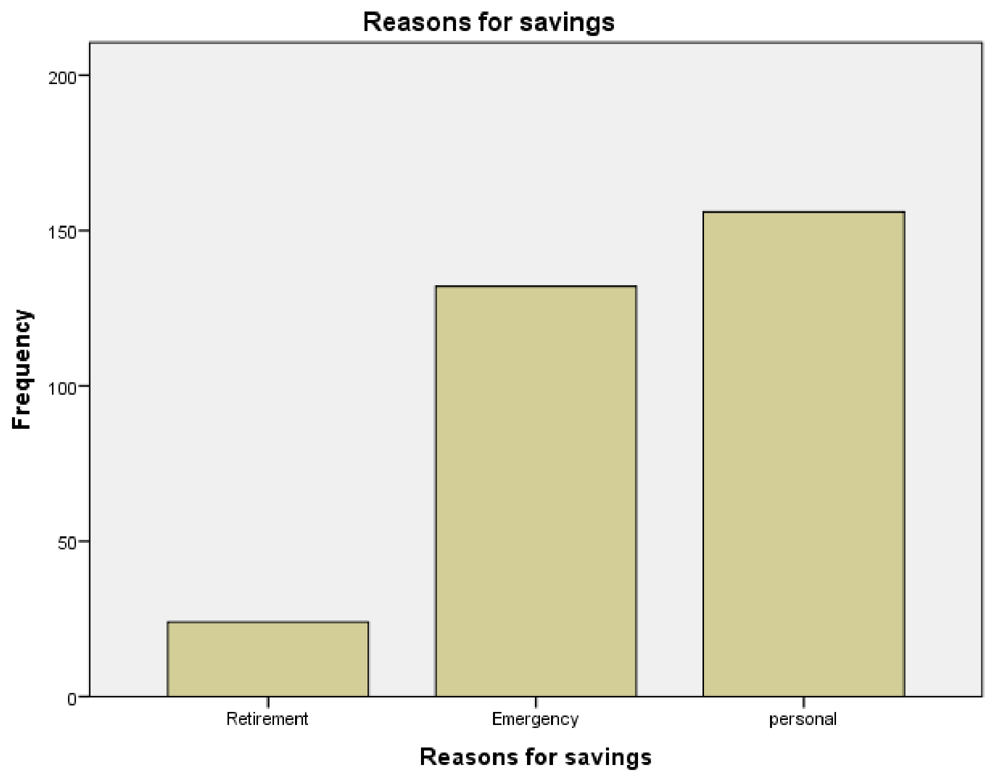

Figure 6: ***Reason for saving***

The method of saving defers amongst individuals. Therefore, the research enquired on the method used mainly to save by the residents. The results of the analysis are as shown in figure 7 below. The highest number of household heads saved using mobile account (97) and bank account (100). Other used home bank (59) while 56 household heads used other forms of saving such as chamas or storing money in form of property.

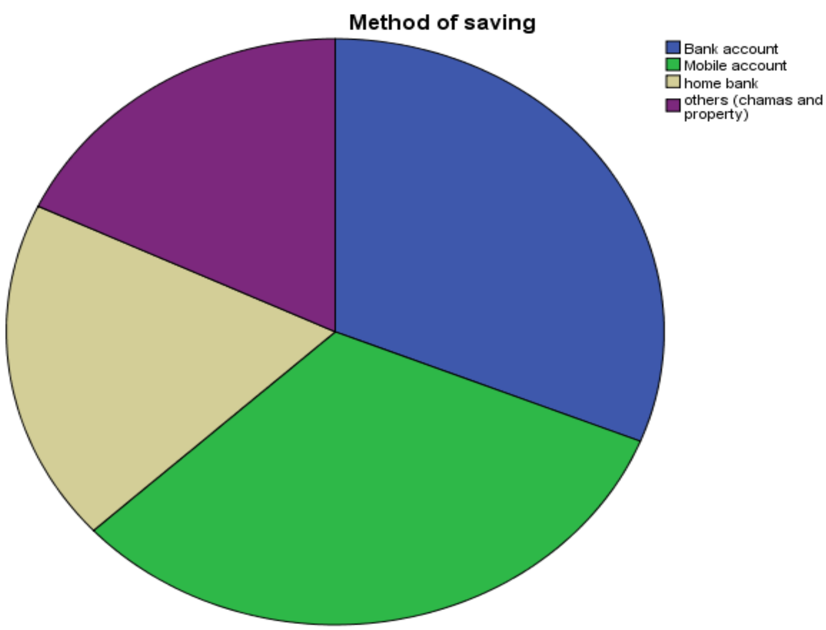

Figure 7: ***Method of saving***

5-Likert scale was used to investigate the rate and extent to which the savings were invested and the results of the analysis are as shown below in table 11. Most residents strongly disagreed (31%) with the statement that they invested their savings while an equal proportion agreed and strongly agreed (19%) to investing most of their income.

Table 11: Extent of savings

	Frequency	Percent
Strongly disagree	96	31
Disagree	72	23
Neutral	24	8
Agree	60	19
Strongly agree	60	19
Total	312	100

The nature of the investment from the savings was also considered an important factor in financial inclusion. Therefore, the research explored the different categories into which savings were directed. The results of the analysis are as presented in the table 12 below. There seemed to be a tag of war between how much of the income was saved and most people agreed to have been saving most their income as shown in the table below.

Table 12: Investment of savings

	Frequency	Percent
Strongly disagree	96	31
Disagree	72	23
Neutral	24	8
Agree	60	19
Strongly agree	60	19
Total	312	100

To understand savings behavior, the research explored the barriers to saving and the results were as translated in the figure below. The towering barriers to saving are inadequate income and unemployment as shown in figure 8 below.

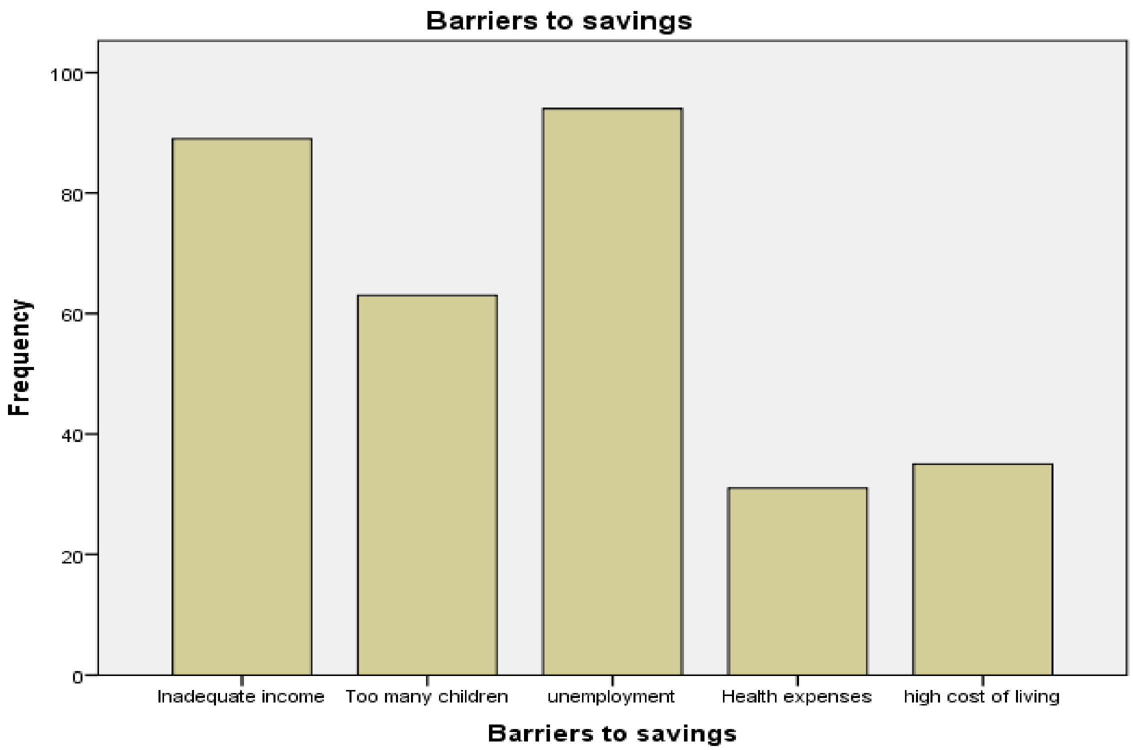

Figure 8: Barriers to savings

Effect of Savings Culture on Financial Inclusion

Savings culture has a positive effect on ownership of active bank account and access to credit (r=0.785 and r= 0.751). Savings is generally a significant determinant of financial inclusion (p=0.05). Income saved however has no significant effect on ownership of an active bank account as well as reason for borrowing (ρ=0.934 and ρ=0.459). Additionally, reason for saving has insignificant effect in determining access to credit and reason for borrowing (ρ=0.408 and ρ=0. 312). The method of saving is the most significant determinant of financial inclusion for the residents of urban informal settlements at ρ=0.05. This implies that the method of saving determines the number of active accounts owned, access to credit and reason for borrowing. The effects of savings culture on financial inclusion indicators are as shown by the analysis. The findings are consistent with Gjonnes (2016) who found that there is a positive relationship between domestic savings and access to financial services.

Regression analysis

Table 13: Regression Results on Financial Inclusion

	Unstandardized Coefficients		Standardized Coefficients		
Financial Inclusion	B	Std. Error	Beta	T	Sig.
Constant	0.491	0.123		3.9919	0.05
Financial Education	0.283	0.064	0.1393	4.4219	0.000
Income Level	0.436	0.041	0.1453	10.634	0.000

Infrastructure access	0.158	0.224	0.2877	0.7054	0.2898
Savings Culture	-0.119	0.059	-0.0571	2.0165	0.000

A multivariate regression model was used to determine the importance of the four factors in determining financial inclusion of urban informal settlements. The model of the study was given as:

$Y_i=a_0+a_1X_1+a_2X_2+ a_3X_3+a_nX_n +\varepsilon$

Where X_1, X_2, X_3 and X_4 are the independent variables, a_n, a_2, and a_1, are the coefficient variables and a_0 is the constant while ε is the error term in tandem with the classical OLS assumptions. Y_i is the individual financial inclusion indicator. The independent variables as highlighted in the conceptual framework are financial education, income level, infrastructural access and saving culture. The dependent variable was given by indicators of financial inclusion namely: ownership of active bank account and accessibility to credit.

From table 13 above, we can obtain the a_i and X_j which are given as:

$Y=0.491+0.283\ X_1+0.436\ X_2+0.158\ X_3-0.119\ X_4$

The model frantically shows a positive and negative effects among the four variables. This implies that an increase in financial education, income levels, infrastructural access and saving culture affects the level of financial inclusion differently. An increase in the variables increases or reduces the level of financial inclusion by 0.283, 0.436, 0.158 and -0.119 respectively (relationship given according to the order of variables). Holding all other factors constant, the level of financial inclusion in informal urban settlements of Kenya is at 0.49 units. These effects can be interpreted per variable as follows. An increase in a unit of financial education increases the level of financial inclusion by 0.283 units. The level of income has a positive effect on financial inclusion. Most people are therefore not likely to rely on formal financial facilities when they have high income. A unit increase in infrastructural access increases the level of financial inclusion by 0.158 units. A unit increase in level of saving culture reduces the level of financial inclusion by 0.119 units. Saving culture had a negative coefficient because most people saved using informal methods such as home bank and chamas as discovered in the research. This implies that promoting this kind of saving method would reduce the level of financial inclusion for urban informal settlements.

A t-test performed to show the significance of the effect of the four determinants of financial inclusion at p=0.05. The coefficients with p value equal or less than the preselected alpha of 0.05 were considered significant while those with a higher value insignificant. In this case, financial education, savings culture and income level were significant indicators of financial inclusion while infrastructural access was insignificant. This therefore implies that all the independent variables can significantly explain the proportion of financial inclusion that changes as a result of a change in any of the factors except infrastructural access.

In terms of embracing financial inclusion, summary statistics indicate that only 44.2% of the residents of the informal settlements have access to the accounts. Regressions results indicate that the main indicators of financial inclusion the social economic characteristics namely: financial education, income level, infrastructural access and savings level not individual characteristics such as gender, place of residence and age category. Financial education level indicators are positively associated with financial inclusion: implying that the higher the education attainment and awareness, the possibility of owning an active bank account. Income level is a significant determinant of and it is positive associated with the ownership of active account regardless of the source. Availability and access to infrastructure is also a significant determinant of ownership of an active bank account and easing access to credit for any use.

From the above regression analysis, it is clear that the main determinants of financial inclusion in urban informal settlements of Kenya are financial education, infrastructural access and savings culture. Financial education has a high positive coefficient implying that the more informed and aware individuals are, the higher the possibilities of being financially included. However, infrastructural access has the highest positive effect on financial inclusion given by the high-standardized coefficient of Beta (0.2877). The results relate to those of a study by Boit (2015), where he found that financial education and infrastructural access have a significant effect on financial inclusion. In the research by Boit, (2015), infrastructural access has a high positive effect on financial inclusion. Income level also significantly affects financial inclusion as found in the study by Park and Mercado, (2015) which investigates financial inclusion, poverty, and income inequality in developing India. Just like in Zins and Weill, (2016) in their study on the determinants of financial inclusion in Africa, savings culture has a significant effect on financial inclusion.

Summary, Conclusions and Recommendation

The main objective of the study was determining factors that influence financial inclusion of urban informal settlement dwellers. The main respondents were residents of urban formal and informal settlements of Nairobi County with the focus area being Mathare slums. Data was collected using both close ended and open questions. Collected data was analyzed using descriptive and inferential techniques. Demographic data indicated that there is an equal representation of male and female population in the region made up of mainly young people 18-24 years. The household heads represented in the study showed a well balanced representation of literacy levels with quite a good number of university and tertiary college level individuals.

Overview of Financial Inclusion in Mathare

The research showed that the average financial inclusion in the region was 44% since only this number of residents had active bank accounts. Most individuals borrowed informally for medical and pay school fees. Only 36% had access to formal credit. Most individuals found it very difficult or almost impossible to access credit from formal financial institutions. This could greatly affect development of urban informal settlements since it hinders formal savings thus most people cannot access credit to support business and self employment.

Effect of Financial Education on financial inclusion

The research further revealed that financial education factors were important determinants of financial inclusion since all the financial education variables were statistically significant at 5% level of significance. The research also showed that promotional activities for use of financial services were carried out to support and create awareness among the urban informal settlement dwellers. However, most people found it difficult to share information or explain to their neighbors the access, use and availability of financial services within their residence.

Effect of Income Level on financial inclusion

The level of income has significant effects of financial inclusion for urban informal settlement dwellers. Most residents earned middle and high income clusters given in the study. Most income was obtained from business and farming. Employment was the major source of very high income but there were few individuals that were employed. Nonetheless, most people strongly disagreed that they could comfortably live on the income they earned. The lower the income, the higher the chances of being financial excluded. This implied that it was impossible for low income earners to have active bank accounts or access credit from formal financial institutions.

Effect of Infrastructural Access on financial inclusion

The findings further showed that infrastructural access is an important determinant of financial inclusion of urban informal settlements. Availability of proper functioning infrastructure proved very important in enhancing financial inclusion of urban informal settlements. Financial services providers were evenly distributed in the region with others concentrated in one region depending on the distance of accessing the financial services. For the regions where financial services were close, it is because the services were evenly distributed and vice versa. Convenient and proper functioning financial services providers encouraged more people to engage in formal financial services and expand businesses. This reduced operation and transport costs and increased the need to engage formal financial services. The government seemed less supportive in providing necessary physical infrastructure to support access and use of financial services in the region. Infrastructural access was therefore found to be an insignificant determinant at 0.05 level of significance and r=0.743.

Effect of Savings Culture on financial inclusion

Saving as a factor was found to be a significant determinant of financial inclusion for the residents. Most individuals saved using informal methods of saving such as under the mattress or using the home bank. Mobile and bank account saving seemed a popular method of saving amongst the residents at 31% and 32% respectively. Most individuals save for emergency and personal reasons with very few individuals saving or planning for retirement. Most people disagreed to investing their savings while those invested mainly did so for education or ownership of property. The greatest barriers to savings were inadequate income, high cost of living and unemployment.

Conclusion

Kenyan urban informal settlements have low levels of financial inclusion as shown in the findings above. In comparison to the set financial inclusion levels in vision 2030 to be 80%, nationally, full financial inclusion of urban informal settlements still seems a distant boat. Since financial inclusion can help in alleviation of poverty as well as boosting economic growth, understanding determinants of financial inclusion of urban informal settlements in Kenya is of great importance. This research showed that financial education, income level, access to infrastructure and saving are significant determinants (p=0.05) of financial inclusion of urban informal settlement.

On financial education, the study showed that when people are continuously informed and are aware as well as trained on use of and access of financial services more people could own active accounts and easily access credit. This in turn could propel economic growth and improve livelihoods. Financial education and promotion activities seemed to play a role in enhancing awareness and fostering the reach of the unbanked.

On infrastructural access, distance between service providers determined whether the services were evenly distributed or concentrated. This in turn affected the ease of access and use of financial services. The government and financial services provider have an undisputed upper hand in promoting financial inclusion through provision of physical amenities necessary for finance access.The government providing physical infrastructure to aid access could enhance infrastructural access and use of financial services since the government did not seem to do enough to promote financial inclusion of urban informal settlements.

The level of income proved a very important determinant of financial inclusion amongst urban informal settlement dwellers. High and very high-income levels increased the chances of an individual being financially included.

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Finally, the motivations of borrowing and saving lead to similar conclusions. Most individuals save for emergency and personal. They also borrow for related reasons. Whether educated, poor, rich or can access financial services easily most residents borrow and save to pay medical bills and school fees.

To sum the research up, the findings of this research contain key indicators that could help in designing policies to foster financial inclusion of urban informal settlements. The research emphasizes on the role policies that target specific population groups can play in enhancing financial inclusion. The effects of such policies on financial inclusion can be significant and positive. It also sheds light on obstacles faced in achieving financial inclusion of urban informal settlements.

Recommendations

The research raised several issues that could be considered for further research on issues relating to urban informal settlements and ensuring that the financially excluded are included. The results could be extended to other population segments. This in turn could lead to increased social-economic growth and development of urban informal settlements and by extension other regions in the country. To foster financial inclusion in urban informal settlements, this research recommends: first in reference to financial education, there should massive campaigns by financial service providers to promote financial education of the residents to erase fears of use of formal financial services; second in relation to income levels, to increase income levels, access to credit should be eased to promote employment creation and boost business ventures; third, the government and financial services providers should provide physical infrastructure and amenities to ease access of financial services. Finally, to promote a saving culture, there should be more employment opportunities and better and cheaper health services to reduce income spent on medical expenses. This in turn would promote financial inclusion of urban informal settlement residents.

This research contributes to the body of knowledge in several ways. Financial inclusion is an important agenda by the government for the overall social-economic development of the country. The research aims at ensuring that urban informal settlements are financially included to enable them secure their livelihoods and raise the living standards. Additionally, the main goal of financial inclusion is to eradicate poverty in all its forms through bridging the gap between discriminated or weaker societal sections and sources of livelihood. In this case, enhancing access to credit for urban informal settlement population could boost their education and business, which could in turn support their well-being.

The implications derived from the study based on the objectives include; one, when individuals are well financially educated, development of urban informal settlements is possible; two, infrastructural access is a very basic determinant of financial inclusion whereby if physical infrastructure is present most people can easily access financial services; third, the higher the income, the higher the probability of financial inclusion; finally, savings and financial inclusion go hand-in-hand. Initiatives such as creating bank accounts with low costs of operation could enhance financial inclusion. Building financially inclusive urban informal settlements requires reducing income inequality, promoting financial literacy, improved access to physical infrastructural amenities and promoting a saving culture.

Further Studies Recommendation

There several areas that the study does not cover and they form suggestions for further studies, which include:

i) The study can be replicated in other regions of the country besides Nairobi County in non-major towns.

ii) The influence of economic factors on financial inclusion of Kenyan urban informal settlements.

iii) Effects of public policy in promoting financial inclusion of urban informal settlements.

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