



**UNIVERSITY OF NAIROBI  
POPULATION STUDIES AND RESEARCH INSTITUTE**

**AN ASSESSMENT OF FINANCIAL INCLUSION AS A PROXY INDICATOR OF  
POVERTY IN KENYA**

**GERALDINE LUKANIA MAKUNDA**

**REG.NO: Q51/69810/2013**

**RESEARCH PROJECT PAPER SUBMITTED TO POPULATION STUDIES AND  
RESEARCH INSTITUTE IN PARTIAL FULFILMENT FOR THE DEGREE OF  
MASTER OF ARTS IN MONITORING AND EVALUATION OF POPULATION AND  
DEVELOPMENT PROGRAMMES, UNIVERSITY OF NAIROBI**

**NOVEMBER 2016**

## DECLARATION

This project paper is my original work and has not been presented for a degree in any other University.

Signature\_\_\_\_\_ Date\_\_\_\_\_

Name: **GERALDINE LUKANIA MAKUNDA** Reg. No: **Q51/69810/2013**

This project paper has been submitted for examination with our approval as the University Supervisors:

Signature\_\_\_\_\_ Date\_\_\_\_\_

**PROFESSOR ALFRED AGWANDA**

Signature\_\_\_\_\_ Date\_\_\_\_\_

**DR SAMUEL WAKIBI**

## **DEDICATION**

I would like to dedicate this project to my dear parents, Timothy and Julia Makunda, my brothers, Collins and Brent Makunda and my son, Kwame Mengo, for their unwavering moral support, encouragement, ideas and patience throughout my study period. I also dedicate this project to Kenya Markets Trust (KMT), my previous employer, who partially financially supported my studies and is the reason why I developed a passion for monitoring and evaluation. In addition, I dedicate this report to Financial Sector Deepening Trust Kenya (FSD Kenya), my current employer, which exposed me to the subject of financial inclusion and through it I have appreciated its potential for poverty reduction. It is my sincere hope that this report will contribute to strengthening the work of FSD Kenya. Last, but not least, I dedicate this project to Population Studies and Research Institute (PSRI), as one of the first projects by the first M&E postgraduate class. I hope that this work will contribute to the existing body of knowledge and that it will inform future similar assessments.

## **ACKNOWLEDGEMENTS**

I would like to give special thanks to my supervisors, Prof. Alfred Agwanda and Dr. Samuel Wakibi for their invaluable guidance throughout the period I undertook the project. Their wealth of knowledge, especially in the application of statistics to life situations and of the subject matter has shaped this research project to what it is now.

I would like to acknowledge the management of KMT for the partial financial support and allowing me study time while I worked with them as a Knowledge and Results Manager. The opportunity that was provided to me, giving me a chance to apply my monitoring and evaluation knowledge cannot be taken for granted.

I acknowledge my current employer FSD Kenya for providing me with knowledge on financial inclusion and the datasets that enabled me to have a successful execution of this project.

I give special thanks to my dear parents, Timothy and Julia Makunda, my brothers, Collins and Brent Makunda and my son, Kwame Mengo for their unwavering moral support, encouragement, ideas and patience which gave me the drive to carry on with and finalize the project.

I also want to thank my friends, colleagues, classmates and the entire Population Studies and Research Institute for the invaluable support during my study period.

Finally, I remain, as ever, grateful to God, who has ushered me with great blessings for me to successfully complete this project in time and with minimal challenges.

## TABLE OF CONTENTS

DEDICATION .....	iii
ACKNOWLEDGEMENTS .....	iv
TABLE OF CONTENTS .....	v
LIST OF FIGURES .....	vii
LIST OF TABLES .....	viii
ABBREVIATIONS AND ACRONYMS .....	x
ABSTRACT .....	xi
CHAPTER .....	ONE:
.....	1
INTRODUCTION .....	1
1.1 Background of the study .....	1
1.2 Problem statement.....	3
1.3 Research question .....	4
1.4 Study objectives .....	4
1.4.1 General objective .....	4
1.4.2 Specific Objectives .....	4
1.5 Justification of the study .....	5
1.6 Scope and limitation of the study.....	6
CHAPTER .....	TWO
.....	7
LITERATURE REVIEW .....	7
2.1 Introduction.....	7
2.2 Financial inclusion and poverty interrelationships .....	7
2.3 Conceptual framework.....	14
2.4 Operational framework .....	20
CHAPTER .....	THREE
.....	26
METHODOLOGY .....	26
3.1 Introduction.....	26
3.2 Sources of data.....	26
3.3 Sampling .....	26
3.4 Data analysis .....	27

CHAPTER	FOUR
.....	28
Financial inclusion as a poverty proxy indicator: Findings and discussions .....	28
4.1 Introduction.....	28
4.2 Profile of the respondents in the survey.....	28
4.3 Financial inclusion status in Kenya from 2005 to 2016.....	29
4.4 Financial inclusion indicators against wealth quintiles.....	30
4.5 Ideal poverty proxy indicator determination.....	32
4.6 Categorising the indicators.....	34
4.7 Association of inclusion indicators with poverty.....	35
4.8 Variations among the various wealth levels.....	38
CHAPTER	5
.....	43
Summary of findings, conclusions and recommendations.....	43
5.1 Introduction.....	43
5.2 Summary of findings.....	43
5.3 Conclusion .....	44
5.4 Recommendations.....	45
References.....	1
Annex 1: Indicators of financial inclusion against the wealth quintiles .....	9
Annex 2: Summary of the financial indicator variables.....	10
Annex 3: Financial inclusion indicator correlation matrix .....	1

## LIST OF FIGURES

Figure 2.2: Various facets of financial inclusion .....	8
Figure 2.3:The Web of poverty's disadvantages .....	16
Figure 2.4:Development as good change - from ill-being to well-being .....	17
Figure 2.5: Exclusion and inclusion rates in Kenya by sub-region.....	18
Figure 2.6:Headcount Index: Percentage of individuals below poverty line in counties.....	18
Figure 4.1:Financial inclusion and exclusion in Kenya from 2006 to2016 (%) .....	29
Figure 4.2: Determining components with highest variability: Scree plot: .....	33
Figure 4.3: Box Plot for model 1 .....	40
Figure 4.4: Box Plot for model 2 .....	40
Figure 4.5: Box plot for model 3.....	41

## LIST OF TABLES

Table 2.1: Impact of various financial services on the society .....	9
Table 2.2:Operational framework – financial inclusion indicators.....	21
Table 2.3:Operational framework - definition of poverty indicators .....	23
Table 2.4:Relationship between financial inclusion indicators and poverty indicators .....	25
Table 4.1: Profile of the FinAccess respondents analysed from the datasets .....	28
Table 4.2: Financial inclusion and exclusion (%) in 2016.....	30
Table 4.3:Access financial indicators against wealth quintiles.....	31
Table 4.4: Quality financial indicators against wealth quintiles .....	31
Table 4.5:Usage financial indicators against wealth quintiles .....	32
Table 4.6: The strength of association of the indicators .....	34
Table 4.7: Dependent variable - poor and non-poor .....	35
Table 4.8: Variables used in analysis and their coding.....	36
Table 4.9: Prediction of the chances of being poor or non-poor.....	36
Table 4.10: Relationship among the different variables .....	37
Table 4.11: Ranking of model 1 against the wealth quintiles .....	38
Table 4.12: Ranking of model 2 against the wealth quintiles .....	39
Table 4.13: Ranking of model 3 against the wealth quintiles .....	39
Table 4.14: Effect of dependent variables on non-poor or poor .....	42

## ANNEXES

Annex 1: Indicators of financial inclusion against the wealth quintiles .....	9
Annex 2: Summary of the financial indicator variables .....	10
Annex 3: Financial inclusion indicator correlation matrix .....	<u>10</u>

## ABBREVIATIONS AND ACRONYMS

AFI	Alliance for Financial Inclusion
ASCAs	Accumulating Savings and Credit Associations
BASA	The Banking Association of South Africa
CBK	Central Bank of Kenya
CMA	Capital Markets Authority
DFI	Development Financial Institutions
FAO	Food and Agriculture Organisation
FSD	Financial Sector Deepening Trust
G-20	Group of Twenty
GoK	Government of Kenya
IFAD	International Fund for Agricultural Development
IRA	Insurance regulated Authority
KMT	Kenya Markets Trust
KNBS	Kenya National Bureau of Statistics
KPMG	Klynveld Peat Marwick and Goerdeler Business
M4P	Making Markets Work for the Poor
MMT	Mobile Money Transfers
MNO	Mobile Network Operator
NHIF	National Hospital Insurance Fund
NSSF	National Social Security Fund
NWMS	National Welfare Monitoring Survey
PRSP	The Poverty Reduction Strategy Paper
RBA	Retirement Benefits Authority
RCTs	Randomized Control Trials
ROSCAs	Rotating Savings and Credit Associations
SACCO	Savings and Credit Co-operative
SAE	Small Area Estimation
SG	Savings groups
SID	Society for International Development – East Africa
SME	Small and Medium Enterprise
UNDP	United Nations Development Programme
UNICTRAL	United Nations Commission of International Trade Law

## ABSTRACT

The study aimed at assessing to what extent financial inclusion is related to poverty and determine whether it can be used as an indicator to monitor poverty levels at the household level. The main data source was the National FinAccess household 2016 survey. The main analysis was done using SPSS statistical tools primarily, cross tabulations, logistical regressions and the Principal Component Analysis (PCA). Financial inclusion in Kenya has changed over the years and this is tracked approximately every three years by the government of Kenya. The financial inclusion levels have changed from 2006 with 58.8% of adults financially included then to 82.2% in 2016 and these vary across different demographics and socio-economic groups. The measure of financial inclusion is directly measurable in a simple manner and is done at least every three years. Financial inclusion, just like poverty, is a multidimensional measure. The study focused on three key financial indicator measures – access, usage and quality. There was a clear difference in access and usage indicators among the different wealth levels but no clear difference in the quality related financial inclusion indicators. The most important indicators identified were awareness of terms, usage of financial services especially mobile money and use of future oriented services – insurance, savings and pensions. Different models were generated to determine how the models could predict the level of poverty as well as determine their purity. The models can be used as poverty proxies because they are significantly associated with financial inclusion or exclusion variables. They would also act as good proxies as no single indicator can be used, being multi-dimensional in nature. For the financial indicators to work better, they need to take into consideration other variables of the population such as level of education, age, location and gender. The association is still stronger even when control variables are included. The financial inclusion factors can act as good discriminators between poor and non-poor. National poverty studies in most developing countries like Kenya are done after a long period, almost after a decade. These in most cases leave policy makers, researchers, the private sector and development practitioners with no option but to use outdated information. National financial inclusion studies, which are easier and less costly to undertake, are being undertaken more frequently and can be used as proxy poverty indicators. However, more needs to be studied to determine which would be the most ideal indicators to use including exploring the welfare aspect of financial inclusion which was excluded from the study.

## **CHAPTER ONE:**

### **INTRODUCTION**

#### **1.1 Background of the study**

Poverty manifests itself in various forms, it is multidimensional and is also complex in nature making its definition and tracking difficult. There is no one way to define it in a manner that will explain all the aspects of poverty. Some people think of poverty as lacking of material things, others consider the lack of freedom and spiritual well-being as well as having your civil rights and lack of nutrition to be include in the poverty definition. (Mariara et. al., 2004). The World Bank has defined extreme poverty to be persons who are living US\$1.25 or less per day while those living in moderate poverty as those who survive on less than \$2 a day. In 2008, the World Bank estimated that 25.7% of the population were extremely poor and 49.5% of the population lived in moderate poverty (UNDP 2010). For a long time, poverty has been associated with income but this too is difficult to define and must be carefully and precisely elaborated. Most estimations leave out resources such as assets, income obtained in kind and subsidies provided by public services and employment (UNDP 2006). Most Poverty Reduction Strategy Papers (PRSP) similarly recognise that poverty is multi-dimensional. Poverty is defined to include reduction of income and deprivation of the human basic needs and rights, and the lack of access to assets that drive productivity, including social infrastructure and access to markets.

Poverty reduction has been a major development agenda worldwide for years. At several workshops and meetings, leaders have restated and reconfirmed their agreement that poverty should be reduced and ultimately eradicated. Various strategy papers and development programmes have been written and implemented to tackle poverty.

Financial Inclusion is a major objective for many developing nations in the recent past. Many researches have been undertaken to assess the link between financial exclusion and poverty. Financial inclusion can widely be defined as providing financial services at affordable costs to the disadvantaged and low-income communities. Financial exclusion is when these services are not available or affordable. According to the Bank Association of South Africa (BASA) website, “Financial inclusion is the access and usage of a broad range of affordable, quality financial

services and products, in a manner convenient to the financially excluded, unbanked and under-banked; in an appropriate but simple and dignified manner with the requisite consideration to client protection. Accessibility should be accompanied by usage which should be supported through the financial education of clients” (BASA, 2016). Financial inclusion initially focused on having more people using banking services in the developing nations like Kenya access financial services through other types of financial providers such as Savings and Credit Co-operative (SACCO), mobile money transfers (MMT) and saving groups (SGs). These could be formal or informal financial services.

Financial inclusion has become important in the development circles in the last 10 years, becoming a key policy objective for donors and governments. According to the study ‘Finance, Inequality and the Poor’ by the World Bank (Beck et al. 2007), financial development boosts incomes of the poorest quintile disproportionately and may reduce income inequality. It noted that about 40% of the long-term impact of financial development on the income growth of the poorest quintile is due to the reduction in income inequality, while the other 60% is because of the impact of financial development on collective economic growth (Beck et al. 2007). Furthermore, financial development is linked to the reduction of the population living on less than a dollar day (Beck et al. 2007). Financial inclusion impacts on the economic growth of a country by enabling localised development. This does occur by providing communities and individuals access to financial services such as loans, credit and insurance, allowing them to engage in gainful economic activities. In turn, this can empower the people to provide for themselves and their families, and to save and invest some of what they earn.

Globally, Kenya continues to be recognised as one of the leading countries in Africa and indeed the world in financial inclusion which is growing. The recent Brookings, Financial and Digital Inclusion Project (FDIP), Kenya is ranked first among 21 emerging economies in enabling access to and usage of financial services among those excluded from formal finance (Lewi et al. 2015). Kenya has already made significant progress over the last decade in strengthening its formal regulatory structure. Reforms have targeted the major pillars of the formal financial system, banks, insurance companies and capital markets, bringing legislation and regulation in line with international standards and building the capacity of the regulators (FSD Kenya, 2016). Over the past ten years Kenya’s progress in relation to financial access has been impressive.

Overall financial inclusion stood at 58.8 per cent in 2006 and is currently at 82.4 per cent in 2016. Formal financial inclusion has nearly trebled (16 million Kenyan adults), and exclusion is down by more than a half compared with 2006 in the same duration (CBK, FSD Kenya and KNBS 2016). The major cause of this expansion in outreach has been the explosive growth of mobile money, and the extraordinary success of the Mobile Network Operator (MNO) Safaricom's *M-Pesa* money transfer system. The regulatory environment when M-PESA was created allowed Safaricom to innovate and experiment, despite it being an MNO and not a prudentially regulated financial institution. Nevertheless, the increase of access to the banking system has also been impressive. Over the same period bank access has almost tripled from just 15% in 2006 to over 42% in 2016. The growth has been driven by a combination of reworking product offers and expanding retail networks, both making banks more accessible to lower-income segments. Expansion in retail points of presence was accomplished first by simply establishing more branches but more recently using agents. The recent closer integration between the mobile money channel and banks with solutions such as *M-Shwari*, Equitel and KCB *M-Pesa* was an important driver of growth in access to the banking system between 2013 and 2016 (FSD Kenya, 2016).

Financial inclusion has been closely associated with poverty reduction and it would be valuable to see if it can be used to track poverty. The measure of financial inclusion in Kenya is done regularly by the government compared to the measure of poverty, the Kenya Integrated Household Budget Survey (KIHBS) which is done after approximately 10 years. It is also more straight forward and less costly to do financial inclusion studies compared to the poverty studies. The government needs to regularly track its progress in poverty reduction both locally and internationally and if financial inclusion can be used as a proxy poverty indicator, it will go a long way in putting in check development efforts of the country.

## **1.2 Problem statement**

Despite the strides Kenya has made in terms of financial access in the past 10 years, the level of poverty in Kenya remains very high, with almost half of the population living below the poverty line. The 2005 Kenya Integrated Household Budget Survey (KIHBS) found that 46.4% of the Kenya population lived below poverty level (KNBS, 2006), while 2009 population census using

the Small Area Estimation (SAE) reported 45.2 percent living below the poverty level (KNBS, 2015).

Many of the studies undertaken aimed at determining the impact of financial services on poverty provide mixed evidence (Banerjee, Duflo, Glennerster, and Kinnan 2010 and 2014; Crépon, Devoto, Duflo, and Parienté 2011; Karlan and Zinman 2011; Angelucci, Karlan, and Zinman 2013).

There is thus insufficient data to provide a comprehensive view of the impact from changes in financial inclusion over the last decade. The best evidence available derives from either specific study of tools or qualitative demand-side analysis looking in detail at the financial lives of the poor. The former has certainly found some areas of impact – such as use of mobile money and savings tools. However, the scale of the impact found has rarely been transformational in the way expected. A recent study in three market landscapes in Kenya shows that many financial tools have made little impact on investment (Johnson 2015, forthcoming).

The study seeks to examine whether financial inclusion indicators can be used to measure and monitor poverty levels at the household level.

### **1.3 Research question**

To what extent can financial inclusion be used as an indicator to monitor poverty levels at the household level?

### **1.4 Study objectives**

#### **1.4.1 General objective**

The general objective of the study is to assess to what extent financial inclusion is related to poverty and determine whether it can be used as an indicator to monitor poverty levels at the household level.

#### **1.4.2 Specific Objectives**

1. To determine the association between financial inclusion indicators and poverty.
2. To determine if financial inclusion can be used as poverty indicator or a poverty proxy indicator.

## **1.5 Justification of the study**

Financial inclusion has been taking a centre role in the development arena as a major contributor to decreasing poverty levels in the past decade. Kenya's financial inclusion has been growing and is very high compared to many countries worldwide. However, despite the strides made, almost half of its population lives below the poverty line. This study aimed to assess to what extent financial inclusion has on poverty, hence can be used as an indicator to monitor poverty levels. These financial inclusion indicators can be simply and easily estimated compared to other known poverty measures thus can be used to assess the extent to which programmes on financial inclusion are improving on indicators of welfare (poverty).

Gauging the effect of financial sector development on poverty is important not only for academics and development actors, but also for policy makers who must prioritize among several policy agendas to help their countries out of poverty and develop. Euagaric, M., Beck, T. and Hoseini, M., (2013) argue that even if the impact on poverty of finance impact has been established, policy makers have a choice among various policies, including those that focus on deepening the financial system, such as judicial and regulatory reforms, and policies that target at financial inclusion, such as microcredit or increasing branches (Ayyagari et al, 2013). Understanding the means through which financial sector development affects poverty levels is thus critical for policy formulators in aligning goals to support the improvement of the livelihoods of the poor.

According to the Maya Declaration on Financial Inclusion of 2011, "an important aim of financial inclusion is lifting less privileged people and the rural poor out of poverty by helping them build better and more dignified lives" (AFI, 2011). Financial inclusion intersects with several key Sustainable Development Goals (SDGs), adopted in September 2015 as part of the 2030 Agenda for Sustainable Development. These goals "call for action by all countries, poor, rich and middle-income to promote prosperity while protecting the planet." (UN, 2016). Among the SDGs closely connected to financial inclusion are objectives to: end poverty; achieve gender equality; "promote inclusive and sustainable economic growth, employment, and decent work for all" (a goal that is particularly germane to financial inclusion); and reduce inequality within and among countries. Thus, financial inclusion, if is a good poverty indicator can be used to

monitor efforts to reach the key targets associated with the SDGs as countries implement the 2030 Agenda.

### **1.6 Scope and limitation of the study**

This ~~studypaper~~ analysed data at the national level and where necessary, especially for comparisons in inclusion and poverty levels, different regions were used. Only a few facets of poverty were explored related to education, possession of household assets, dealing with shocks and psychological capital (hope, resilience, optimism). Wealth quintiles, derived from the data were used and formed a core basis for the analysis. The concept of poverty being multidimensional made it challenging to isolate the various webs of poverty. However, it was difficult to measure the effect of all the aspects of poverty hence the reason why the study was limited to only four key aspects of poverty which are all interrelated. Financial inclusion has four facets/aspect – Access, Usage, Quality and Welfare. This study was limited to Access, Usage and Quality. The aspect of welfare was left out as the data would not have exhaustively provided this measure. The survey was primarily administered at the individual level hence the level of analysis is limited to this.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **1.7 Introduction**

This chapter presents the related literature on the study. The chapter is presented under the following sections: Background perspective of financial development as a route to reducing poverty, financial inclusion and poverty interrelationships, the conceptual framework and the operational framework.

#### **1.8 Financial inclusion and poverty interrelationships**

Financial inclusion has become a subject of considerable interest among development partners, policy makers, researchers, and other stakeholders. In several international forums, such as the Group of Twenty (G-20), financial inclusion has become key in their reform agenda. About two-thirds of regulatory and supervisory agencies in several countries are now charged with enhancing financial inclusion locally. According to the World Bank, some 50 countries have set formal targets and goals for financial inclusion (World Bank 2014). In Kenya, the financial inclusion target by 2017 is to have 90% of adults financially included (GOK, 2013). This heightened interest indicates a better understanding of the importance of financial inclusion for both economic and social development. It reflects a growing recognition that access to financial services has a critical role in reducing poverty, improving shared prosperity, and supporting all-inclusive and sustainable development. The interest also derives from a growing recognition of the large gaps in financial inclusion (World Bank 2014).

The importance of financial inclusion is seen worldwide with Africa alone having more than 600 active financial sector projects being carried out by various donors. Early financial deepening attempts focused on increasing savings to stimulate investment and support emerging economies to develop faster and steer poverty reduction. Evidence to support the effectiveness of the savings approach has been mixed. This was quickly overtaken by the global microfinance drive, which promoted the benefits of direct delivery and provision of financial service to the poor. According to KPMG, “many financial inclusion supporters now agree that direct access to finance services can improve individual livelihoods amongst the poor by enabling them to

manage scarce resources more efficiently, thereby smoothing consumption and protecting against economic shocks” (KPMG, 2012, p. 1).

According to the Maya Declaration on Financial Inclusion of 2011, a key aim of financial inclusion is to lift the poor out of poverty by supporting them to build better and more dignified lives (AFI, 2011). Financial inclusion programmes should be designed in such a manner that help the poor communities engage in meaningful businesses that have the potential to grow. For instance, an intervention offering reasonable credit to small scale farmers can encourage a farmer to shift from labour intensive farming to more efficient farming such as using machines resulting in greater outputs increasing the farmers’ income impacting on the agriculture value chain. This would benefit the wider population. Financial inclusion comprises access, quality, usage and welfare as summarised in figure 2.1. as defined by (the World Bank, 2015, p.3).



**Figure 0.1: Various facets of financial inclusion**

**Source: Finance for All: Promoting Financial, World Bank, 2015**

In Kenya, formal financial services refer to financial services that are one, used through prudentially regulated service providers, supervised by independent statutory agencies such as the Central Bank of Kenya (CBK), Capital Markets Authority (CMA), Insurance regulated Authority (IRA), Retirement Benefits Authority (RBA) and SACCO Societies Regulatory Authority (SASRA), two, used through service providers that are subject to non-prudential oversight by government departments/ministries with focused legislations or statutory agencies such as the

National Social Security Fund (NSSF), National Hospital Insurance Fund (NHIF) and Postbank or third, financial services used through providers that are legally registered and/or operate through direct government interventions such as hire purchase companies, Development Financial Institutions (DFIs) and non-deposit taking SACCOs. On the other hand, informal financial services are not subject to regulation, but have a relatively well-defined organizational structure. These include Accumulating Savings and Credit Association (ASCAs), *chamas*, Rotating Savings and Credit Associations (ROSCAs), shopkeeper/supply chain credit, employers and moneylenders/shylocks. Financially excluded individuals only use financial services through family, friends, neighbours or keep in secret places (CBK, FSD Kenya and KNBS 2016).

According to a presentation given by the World Bank at a conference in Brazzaville, Congo on Financial Inclusion and Growth in 2015, “financial inclusion can be a key driver of economic growth and poverty alleviation, as access to finance can boost job creation, reduce vulnerability to shocks and increase investments in human capital. Without inclusive financial systems, individuals and firms need to rely on their own limited resources to meet their financial needs and pursue promising growth opportunities. From a policy perspective, greater financial inclusion also holds the promise of potentially making other policies more effective and efficient. Half of the world’s adult population does not have an account at a formal financial institution. Extreme disparities in access to and usage of formal financial services exists across and within countries” (World Bank 2015). The figure 2.1 shows some impacts of financial services on individuals and households.

<b>Universal Access for Individuals at a reasonable cost , to a wide range of people provided by responsible and sustainable institutions</b>	
<b>Service</b>	<b>Impact</b>
Credit	Consumption smoothing
	Investment in human development (health, education)
Savings	Cushion incase of shocks
	Low risk source of self financing
Insurance	Risk management tool for managing shocks
Payments	Electronic cash transfers and remittances
<b>Adapted from the World Bank Group</b>	

**Table 0.1: Impact of various financial services on the society**

**Source: Finance for All: Promoting Financial Inclusion (World Bank, 2015, p.4)**

Financial inclusion is critical in achieving inclusive growth and it is a prerequisite for sustainable economic growth and development. Technology is an effective opportunity for integrating the excluded population into the financial mainstream and it should be harnessed. It can enable the provision of a different types of services ranging from depositing money into various government initiative to availing micro loans and insurance. UNICTRAL noted that uneven and inequitable growth in India has resulted in the exclusion of 51 percent of its population, an estimated 560 million people, from formal sources of financial services. This is identified as a key cause of poverty, together with illiteracy (UNICTRAL, 2010).

Various studies worldwide have attempted to determine the impact of financial inclusion on poverty. In a study undertaken by the World Bank from India, Ayyagari, M., Beck, T. And Hoseini, M., 2013, used national-level data from India from 1983 to 2005 to determine whether financial deepening had any effect on rural poverty. They found that financial deepening reduced poverty rates especially among the rural self-employed population. It also noted an increase in inter-state migration from rural areas into the tertiary sector in urban areas which is in line with financial deepening being driven by credit to the tertiary sector. This finding suggests that financial deepening contributed to poverty reduction in the rural areas through fostering entrepreneurship and driving geographic-sectoral migration (Ayyagari et al, 2013)

The Focus Note of April 2014 (Cull, Robert, Tilman Ehrbeck, and Nina Holle. 2014), a monthly publication by CGAP compiled various case studies summarising evidence of financial inclusion impact at various levels of the economy (microeconomic, local, and macroeconomic levels). The compilation takes impact to mean those effects that could be traced to specific interventions otherwise they would have not occurred. These were obtained from randomized control trials (RCTs) or quasi-randomized impact evaluations. Country panel data comparisons were done for the macroeconomic level analysis.

“Most of the studies provided mixed evidence on the impact of microcredit on important measures of household welfare such as an increase in consumption or income in poor households over the typically relatively short time horizon studied” (Banerjee, Duflo, Glennerster, and Kinnan 2010 and 2013; Crépon, Devoto, Duflo, and Parienté 2011; Karlan and Zinman 2011; Angelucci, Karlan, and Zinman 2013).

Findings from the Spandana study in 2013 in Hyderabad undertaken by Banerjee, Duflo, Glennerster, and Kinnan which goes back to borrowers after 3 years did not find long term evidence of improvements in major welfare indicators including education, health and women's empowerment. However, a study in Mongolia found large impacts on eating more and healthier food when families participated in group loans (Attanasio et al. 2011).

In South Africa, the expansion of access to consumer credit increased borrower well-being. There was increased income and consumption of food. The decision making within the household improved and on the other hand, the borrowers' status in the community improved, as did their overall health and outlook on prospects and position. However, borrowers tended to experience more stress (Karlan and Zinman 2010).

A study of Compartamos borrowers in Mexico by Angelucci, Karlan, and Zinman 2013 did not find major effects on household consumption and expenditures. Nevertheless, it did find that "... the results paint a generally positive picture of the average impacts of expanded credit access on well-being: depression falls, trust in others rises, and female household decision-making power increases" (Karlan et al pg. 16). Studies in India, Morocco and Mongolia also saw a reduction in the spending on temptation goods, such as tobacco. The CGAP focus note of 2014 (Cull, Robert, Tilman Ehrbeck, and Nina Holle. 2014) cautions that "...when interpreting results from the experiments described here is the heterogeneity of effects across subjects. For subjects that do not own businesses, microcredit can help their households manage cash-flow spikes and smooth consumption. Access to microcredit can also lead to a general increase in consumption levels as it lowers the need for precautionary savings. By contrast, for business owners, microcredit can help investments in assets that enable them to start or grow their businesses. In some cases, short-term declines in household consumption coincide with investment during the set-up and growth phases for microbusinesses. Researchers are in fact confirming that access to credit does benefit businesses..." (Cull et al., 2014, p.3).

There is evidence in Mongolia and Bosnia that microcredit spurred new business creation as well as benefitting existing microbusinesses in Mongolia (Attanasio et al. 2011; Augsburg, de Haas, Harmgart, and Meghir 2012). However, another study in the Philippines did not find similar effects. From the compilation by CGAP (Cull, Robert, Tilman Ehrbeck, and Nina Holle. 2014), "...Studies found positive effects on a variety of indicators, including the income of existing

businesses (India, the Philippines, and Mongolia), business size (Mexico), and the scale of agricultural activities and the diversification of livestock (Morocco). In addition, access to microcredit increased the ability of micro entrepreneurs to cope with risk (the Philippines and Mexico). These findings are more remarkable when one considers that most of these studies investigate the effects of credit simply being offered to the treatment group, rather than the effects of actual credit uptake and usage. The results of studies on the impact of savings are more consistently positive than those for credit, although there are fewer of these studies. Savings help households manage cash flow spikes and smooth consumption, as well as build working capital. According to researchers, for poor households without access to a savings mechanism it is more difficult to resist immediate spending temptations. When mechanisms for high-frequency, low-balance deposit services are available, they seem to benefit the poor.” (Cull et al., 2014, p.3 and p.4).

The CGAP paper did review additional studies from Kenya (Cull, Robert, Tilman Ehrbeck, and Nina Holle. 2014) “...A randomized evaluation in rural western Kenya found that access to a new commitment savings service enabled female market vendors to mitigate the effect of health shocks, increase food expenditure for the family (private expenditures were 13 percent higher), and increase investments in their businesses by 38–56 percent over female vendors without access to a savings account (Dupas and Robinson 2013). However, a parallel study with male rickshaw drivers in the same town did not show similar welfare impacts. Another Kenya study that looked at the impact of simple informal health savings products found an increase in health savings by at least 66 percent accompanied by very high take-up rates. When using a commitment savings product, investments in preventative health went up by as much as 138 percent (Dupas and Robinson 2013). The authors found that earmarking for health emergencies increased people’s ability to cope with shocks. The study underlines the importance of health savings and investments in preventative health in reducing poor people’s vulnerability to health shocks...” (Cull et al., 2014, p.3 and p.4). In Malawi, positive effects on business investment, increased expenditures, and crop outputs were observed through commitment savings (Brune, Giné, Goldberg, and Yang 2013). Access to a commitment savings account among female adults resulted in their empowerment in the Philippines. The women reported increased decision-making resulting in a shift toward durable household goods supporting them (Ahsraf, Karlan, and Yin 2010).

Insurance is a financial service that can also support poor households manage shocks and mitigate any unforeseen or foreseen risks. Studies in both India and Ghana of weather-based index insurance indicated a strong positive impact on farmers driven by the assurance of better returns motivating farmers to shift from subsistence to cash crops which in most cases are riskier (Cole, et al. 2013; Karlan, Osei-Akoto, Osei, and Udry 2014). Insured farmers in Ghana purchased more fertilizers, planted on more land, hired more farm-hands resulting to higher yields and income leading to fewer missed meals and less missed school days for the children compared to the non-insured farmers. In a paper written by Sarah A. Janzen and Michael R. Carter, 2013 on a study on the impact of microinsurance on consumption smoothing after a drought, based in Kenya found that index insurance was very important in dealing with the negative impacts caused by natural disasters. The paper noted that when communities are faced with serious drought, farmers with insurance sold fewer assets (minus 64 percent), they missed fewer meals (minus 43 percent), and they were less dependent on any form of food aid and assistance (minus 43–51 percent and minus 3–30 percent respectively) (Carter and Janzen, 2013). According to (Dalal, De Bock, Gelade and Matul, 2013), “Vulnerability to risk and the lack of instruments to cope with external shocks adequately make it difficult for poor people to escape poverty. The still limited impact evidence to date is focused on relatively few insurance products, but suggests that micro insurance could be an important mechanism for mitigating risk. However, demand and uptake—even when offered for free in the context of these evaluations—is strikingly low...” (Dalal et. al., 2013). The key barriers for uptake of financial services such as the lack of trust and liquidity constraints need to be addressed for micro insurance to work for the poor.

On the few randomized evaluations on the impact of payments and mobile money there are two key patterns that stand out - mobile money reducing households’ transaction costs and mobile money improve the household’s ability to share risk. Jack and Suri (2014) examined the impact of these in Kenya. Through analysis of nonexperimental panel data, they found that M-PESA (mobile money provided by Safaricom) users could adequately absorb large negative income shocks including severe illness, job loss, livestock death, and various harvest or business failure, without any reduction in household consumption. By contrast, the consumption for households that had no access to M-PESA fell on average 7 percent in response to a major shock. As the key underlying mechanism, the researchers identified an increase in remittances received both in

number and size and a greater diversity of senders. M-PESA was also observed to facilitate the growth of risk-sharing among social networks of friends and family. Two other studies (Blumenstock, Eagle, and Fafchamps 2012; Batista and Vicente 2012) also noted increased willingness to send remittances because of access to mobile money; however, they did not analyse the impact of this on the welfare of the participants. Among the compilation by CGAP, another randomized evaluation of the impact of a cash transfer program delivered via mobile phone (Aker, Boumnijel, McClelland, and Tierney 2011) showed "...reductions in both the cost of distribution for the implementing agency and the cost of obtaining the cash transfer for the program recipient. The recipients' cost savings resulted in diversification of expenditures (including food), fewer depleted assets, and a greater variety of crops grown, especially cash crops grown by women. Due to the relative newness of mobile money and product-specific issues in conducting welfare impact studies such as disentangling channel and product, it would take time until we have a robust evidence base of how payments and mobile money impact the lives of poor people..." (Cull et al., 2014, p.5).

In summary, various paths to financial inclusion have been attempted and studied. These include increasing savings as a means of smoothening consumption, provision of microfinance and credit for business, access to formal financial institutions, provision of micro insurance and increase in remittances. These have provided mixed findings with some showing long term impacts on poverty while others displaying short term impacts. With Kenya being a global leader in financial inclusion due to the mobile technology revolution the question is why this inclusion has not impacted positively on the wellbeing of most Kenyans. There is thus need to examine to what extent financial inclusion can be used as a poverty indicator informing the financial deepening agenda.

## **1.9 Conceptual framework**

Available literature on financial inclusion provide varying definitions of the concept. Several studies define the concept in terms of financial exclusion largely relating to the broader context of social and economic inclusion. For instance, Leyshon (1995) highlights the exclusion of some groups and individuals from accessing formal financial system. Sinclair (2001) focuses on the inability to access necessary financial services in an appropriate form. Amidžić, Massara, and Mialou (2014) and Sarma (2008) define financial inclusion as an economic state where

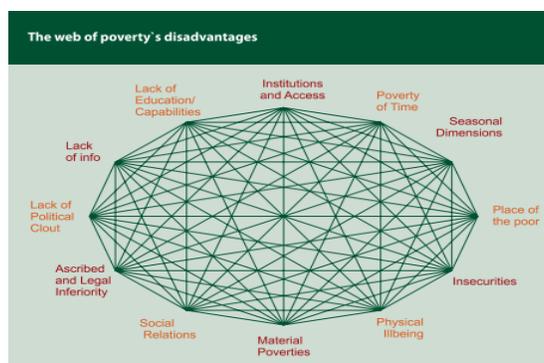
individuals and firms are not denied access to the basic financial services. This study will adopt the definition provided by Sarma (2008) which views financial inclusion as a process that ensures the ease of access, availability, and usage of financial services of everyone in a community. This looks at 3 of the proposed facets of financial inclusion. Unlike the definition of Amidžić, Massara, and Mialou (2014), the advantage of Sarma's (2008) definition is that it builds the concept of financial inclusion based on several dimensions, including accessibility, availability, and usage, all of which can be explored separately.

Poverty is described by the World Bank, 2014 as “not having enough today in some dimension of well-being”. According to the Participatory Poverty Assessment surveys (PPAs), “poverty is hunger, lack of shelter; sickness and being unable to see a doctor (afford medical care). Poverty can also be defined as not being able to go to school, not knowing how to read, not being able to speak properly. Poverty is not having a job and fear for the future, living one day at a time. Poverty is losing a child to illness brought about by malnutrition and unclean water. Poverty is powerlessness, lack of representation and freedom.” (World Bank, 2014).

The National Welfare Monitoring Survey (NWMS) considers “the material well-being perception of poverty in which the poor are defined as those members of society who are unable to afford minimum basic human needs, comprised of food and non-food items. As suggested by Haughton and Khandker (2008), well-being can be defined, and measured, through different approaches...” (Haughton et al., 2008). The first measure of poverty sees well-being as the ability to have command over commodities. Poverty is measured through this conventional approach by the identification of different thresholds that define which level of income, or consumption expenditures, distinguishes the poor from the non-poor. The second measure on the other hand sees well-being as the inability of people to consume certain type of goods, like food, or health, or education. According to this approach, a non-monetary measurement of poverty (for instance, in terms of nutrition or literacy) should be performed along with the monetary one. The third more general approach to well-being is the one postulated by Amartya Sen (1987), who identifies poor individuals as those who lack the capability to function in a society. In other words, poverty emerges when people do not have adequate income, education or health, but also freedom of speech or self-confidence. Under this perspective, poverty is a multidimensional

phenomenon, which must be tackled from many angles (e.g. not only raising income, but also providing education, empowerment, etc.).

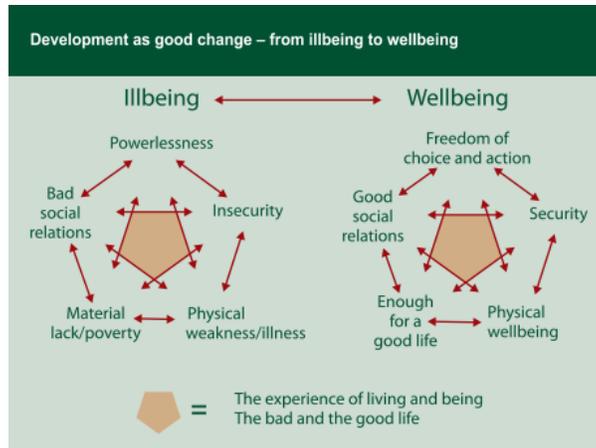
Understanding the different measures of poverty and how they link with financial inclusion, can provide an important basis to determine the impact of financial inclusion on poverty. From a methodological perspective, the “monetary approach” to poverty consists of the identification of thresholds or “cut-offs”, known as poverty lines. These thresholds are defined using households’ welfare indicators such as income or expenditures. The World Bank distinguishes between “absolute poverty lines” and “relative poverty lines”. While the latter are defined through within-countries comparison (that is, considering the income or consumption distribution in a country), the former rather correspond to a standard definition of poverty, conceived as the inability for the individual to meet his or her basic needs. The absolute poverty lines are normally based on estimates of the resources, primarily food, which enables households to meet their basic needs. To this end, individuals living below “\$1 a day” are assumed to live in absolute poverty. This research will use poverty using all three definitions. Wellbeing can be looked at in various dimensions all of which are interrelated as illustrated in figure 2.2.



**Figure 0.2: The Web of poverty's disadvantages**

**Source:** “Poverty in focus” downloaded from “UNDP <http://www.ipc-undp.org/pub/IPCPovertyInFocus9.pdf>”

The study will specifically look at education, possession of household assets, dealing with shocks and psychological capital (hope, resilience, optimism) and how these are influenced by financial inclusion.



**Figure 0.3: Development as good change - from ill-being to well-being**

**Source: “poverty in focus” downloaded from “UNDP <http://www.ipc-undp.org/pub/IPCPovertyInFocus9.pdf>”**

The measurement of the effect or impact of any financial inclusion initiatives can be done through building up ideal indicators. The ideal indicators must contain data on the access to (supply of) and the use of (demand for) financial services as well as the extent of their coverage and penetration. These are summarised in figure 2.1.

It will be necessary to measure the availability and actual use of accounts, payment services, micro credit and insurance for poor households. The second aspect is about understanding the constraints or the barriers for financial inclusion and the development of indicators for assessing the same. Another relevant dimension is reviewing transactional data on credit, deposits, remittances, etc. This is important to determine the effectiveness of the financial inclusion initiatives. Simply opening of accounts without ensuring transactions dents the intended beneficial impact of the financial inclusion measures.

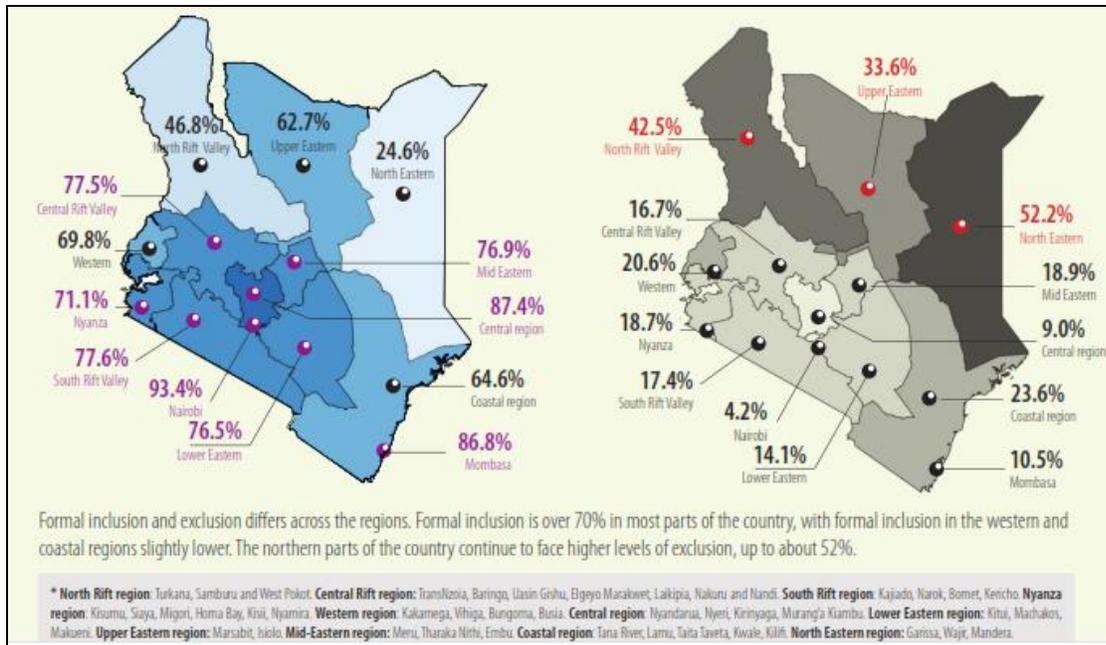


Figure 0.4: Exclusion and inclusion rates in Kenya by sub-region

Source: FinAccess 2016 Headline Report

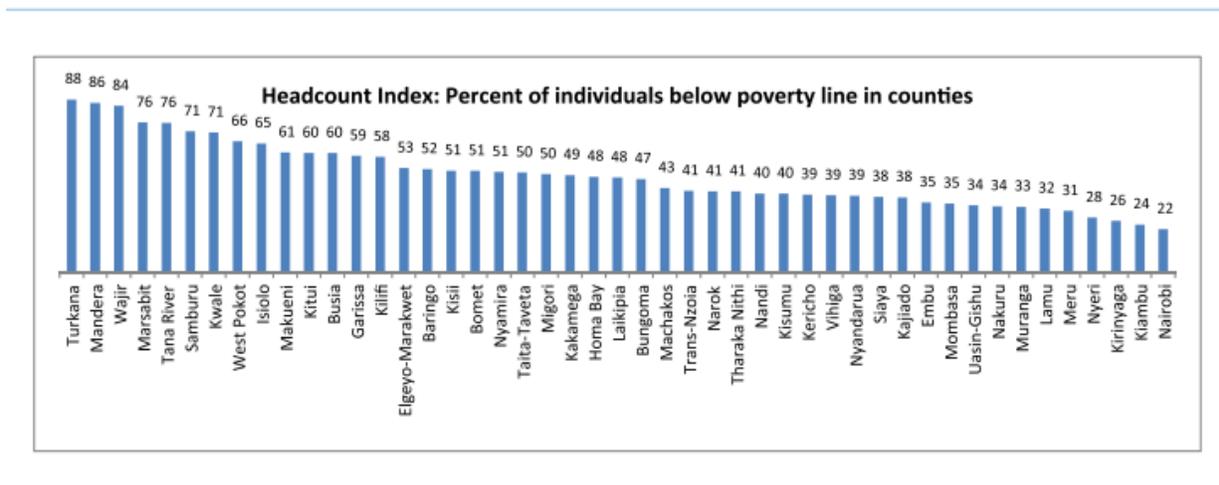


Figure 0.5: Headcount Index: Percentage of individuals below poverty line in counties

Source. Exploring Kenya's Inequality: Pulling Apart or Pooling Together? KNBS, SID

The FinAccess 2016 survey findings provide various possibilities in which financial inclusion can affect poverty as already been indicated in figure 2.4 and 2.5 above showing the disparities in the regional distribution of inclusion levels in Kenya. Formal inclusion is over 70% in most

parts of the country, with formal inclusion in western and coastal regions slightly lower. The northern parts of the country face higher levels of financial exclusion, up to about 52%. The national average for the country is 75.3% (FinAccess 2016, CBK, FSD Kenya and KNBS, 2016).

In terms of sex disparities, formal inclusion is higher among men than women with half of the men being formally included compared to women with only 35% formally included. 47% of men use banks while for women it is 31%. The same trend is observed in the use of mobile financial services (MFS) with 76% of men having a registered mobile money (MM) account compared to 67.5% of women. Only when it comes to informal services and microfinance institutions/banks (MFI/MFB) usage do we see higher usage among the women than men. 51% of women belong to informal groups compared to 31% of men while in MFI/MFB usage, 4.5% of women are involved compared to only 2.6% of men using them.

The FinAccess 2016 report further shows that in terms of rural and urban comparisons, the gap between the two continues to rise over the past 10 years since 2006. Exclusion in rural areas is about double that of urban areas at 22%. The urban exclusion rate is 9.5% down from 42.8% in 2006. Rural exclusion was 40.7% in 2006. Use of banks in urban areas is 57.7% while in rural areas it is 27.3%. This difference is also reflected in the use of mobile financial services where urban usage is at 83.5% compared to 64.4% in rural areas. Informal usage slightly varies between urban and rural at 43.8% and 40.1% respectively.

When it comes to wealth quintiles, exclusion for the poorest is high at 42% compared with the overall national level average of 17.4%. By contrast, 95% of the wealthiest quintiles are formally included. The usage of all types of financial service providers increases with wealth, especially for the formal providers, where a big gap between the top quintile and the rest exists. However, informal providers are widely used by all wealth bands. Annex 1 table summarising the frequencies of financial inclusion indicators by wealth quintiles to determine their relevance and adoption for the study. There is disparity in terms of poverty levels as far as the indicators of financial inclusion are concerned. The control variables were selected from these.

## **Summary**

For financial inclusion to be meaningful to the low-income population, the financial system should deliver real value to them. Financial inclusion shall comprise; access, quality and usage in

this study. The financial services should be affordable, useful and trusted. When the financial services are made available and affordable to users, it is expected that there will be more usage of these services as they are meeting the financial needs of the target population. If these are achieved, the low-income population's welfare should be improved and their poverty levels reduced. Sustainable improvements in the lives of the lower income communities in terms of growth, resilience and quality of life should then be observed, if indeed financial inclusion can impact on this. The study aims at determining to what extent financial inclusion can be used as a poverty indicator. The poverty dimensions studied here are; education, possession of household assets, dealing with shocks and psychological capital (hope, resilience, optimism).

### **1.10 Operational framework**

In terms of actual measurement, the study used financial inclusion data to determine the level of accessibility (what population is accessing financial solutions?) Availability (what financial solutions are available to the selected population?) Usage (how often are they using these financial solutions and for what purpose?)

The research also looked at various financial instruments that have been developed and through which the poor have been participating, considering the three facets of financial inclusion namely; access, quality and usage. The other aspects include poverty indicators that relate to four aspects of well-being; education, possession of household assets, dealing with shocks and psychological capital.

“...An indicator is a variable whose value changes from the baseline level at the time an initiative began to a new value after the program and its activities have made their impact felt. At that point, the variable, or indicator, is calculated again. An indicator is a measurement. It measures the value of the change in meaningful units that can be compared to past and future units. This is usually expressed as a percentage or a number. Good Indicators must have the following qualities. A good indicator must be relevant, objective, available, realistic and specific. The characteristics of good indicators must be SMART – Specific, Measurable, Achievable, Realistic and Time bound...” (Mnestudiescom, 2016). According to the World Bank, “... good poverty indicators should be direct, unambiguous measures of progress, vary across groups, areas and over time, have a direct link with interventions, relevant to policy making, consistent

with the decision-making cycle, not easily manipulated or blown off course by unrelated developments, easy and not too costly to measure, easy to understand, reliable and consistent with data available and the data collection capacity...” (World Bank 2016).

On the other hand, a proxy indicator is a variable that can be used to stand in for an indicator that is not easy to measure directly. This could be due to the cost, complexity and/or the timeliness of data collection which may prevent a finding from being measured directly. A proxy indicator should fit the characteristics of a good indicator (UNDP 2002).

The study will determine if the characteristics of the financial inclusion indicators meet the criteria to be poverty indicators or poverty proxy indicators. The approach that will be adopted for the study has been summarised below.

<b>OPERATIONAL FRAMEWORK – FINANCIAL INCLUSION INDICATORS</b>		
<b>FINANCIAL INCLUSION</b>	<b>DEFINITION</b>	<b>OPERATION INDICATORS AND THEIR MEASUREMENT</b>
ACCESS	<ul style="list-style-type: none"> <li>Ability to use financial services. due to proximity, availability of channels</li> </ul>	<ol style="list-style-type: none"> <li>Proximity to financial access points</li> <li>Availability of financial solutions</li> <li>Channels for financial</li> <li>Barriers to access – awareness, trust, cost</li> </ol>
QUALITY	<ul style="list-style-type: none"> <li>The appropriateness of financial services</li> </ul>	<ol style="list-style-type: none"> <li>Convenience -</li> <li>Security – trust,</li> <li>Consumer protection – loss of money</li> </ol>
USAGE	<ul style="list-style-type: none"> <li>Actual use of financial services</li> </ul>	<ol style="list-style-type: none"> <li>Products – what products use</li> <li>Patterns – frequency of use</li> <li>Behaviours – saving, borrowing behaviour</li> </ol>

***Table 0.2:Operational framework – financial inclusion indicators***

***Source: Modified from the Finance for All: Promoting Financial, World Bank, 2015***

<b>OPERATIONAL FRAMEWORK – DEFINITION OF POVERTY INDICATORS</b>		
<b>POVERTY</b>	<b>DEFINITION</b>	<b>OPERATION INDICATORS AND THEIR MEASUREMENT</b>
HOUSEHOLD POSSESSIONS	This will look at the assets owned in a household, the housing characteristics and service infrastructure – water access and type of toilet. A wealth index is then derived for each individual and quintiles are derived.	Wealth quintile – poorest, second poorest, middle, second wealthiest and wealthiest.
INCOME LEVEL	This will be based on individual income and will be given in either mean and a cut-off point derived to group the levels of poverty.	Income levels
EDUCATION AND FINANCIAL LITERACY	This is the education level attained by the respondent and household head. The level of education is a good indication of whether one is aware and understands the existing financial solutions and how these can benefit them in future. Individuals and households who are financially literate are better placed to make informed decisions about how they will save, borrow or invest.	None, primary level, secondary level and tertiary level. Financial numeracy
SHOCKS	The ability to handle shocks and get back to normal life. Being resilient and able to smoothen consumption.	Use of insurance Having savings Ability to access credit Sleeping hungry Foregoing medicine
ASPIRATIONS AND OVERALL LIFE OUTLOOK	The general feeling towards life and the self-confidence to look forward to it	Goals in life Vulnerability Feelings towards life – improved towards life Worrying about the future

OPERATIONAL FRAMEWORK – DEFINITION OF POVERTY INDICATORS		
POVERTY	DEFINITION	OPERATION INDICATORS AND THEIR MEASUREMENT
		Planning for the future

*Table 0.3:Operational framework - definition of poverty indicators*

*Source: Derived from FinAccess 2016 survey indicators*

The table below shows the relationship between the indicators for poverty and wellbeing and the indicators of financial inclusion

OPERATIONAL FRAMEWORK – RELATIONSHIP BETWEEN FINANCIAL INCLUSION INDICATORS AND POVERTY INDICATORS			
INDICATORS OF FINANCIAL INCLUSION	MEASUREMENT	POVERTY/WELLBEING INDICATORS	MEASUREMENT
<b>A. ACCESS</b>			
1. Distance from a financial service provider	<b>Categorical:</b> Close enough to walk, Less than KShs 50 and more than KShs 50	Wealth quintile	<b>Categorical:</b> 1 = lowest, 5 = Highest
		Income levels	<b>Categorical:</b> KShs. 0-3000, KShs. 3001 – 15000, KShs. 15,001 – 30,000 KShs. 30,001 – 100,000 Over KShs. 100,000
		Education levels	<b>Categorical:</b> Non, Primary, Secondary Tertiary
		Numeracy level	<b>Categorical:</b> High = 3, Medium = 2, Lowest = 1
		Shocks experienced	<b>Binary:</b> 1 = yes, 0 = No
		How deal with shocks	<b>Categorical:</b>

<b>OPERATIONAL FRAMEWORK – RELATIONSHIP BETWEEN FINANCIAL INCLUSION INDICATORS AND POVERTY INDICATORS</b>			
<b>INDICATORS OF FINANCIAL INCLUSION</b>	<b>MEASUREMENT</b>	<b>POVERTY/WELLBEING INDICATORS</b>	<b>MEASUREMENT</b>
			Financial instrument, social networks, nothing
		Ability to access KShs. 3000 within 3 days	<b>Binary:</b> 1 = yes, 0 = No
		Most important goal	<b>Categorical:</b> Education, putting food on the table, getting a job
		If financial life has improved/remained the same/worsened	<b>Categorical:</b> Improved, Remained the same, worsened
2. Uses at least one formal or informal financial instrument	<b>Binary:</b> 1 = yes, 0 = No	Same as above	Same as above
3. Awareness of financial terms	<b>Binary:</b> 1 = yes, 0 = No	Same as above	Same as above
4. Level of trust in financial service providers	<b>Categorical:</b> Most trusted, least trusted	Same as above	Same as above
<b>B. QUALITY</b>			
5. Most important financial instrument	<b>Categorical:</b> Keep most of my money, most easily accessed, use most often, helps me most during emergencies	Same as above	Same as above
6. If experiences unexpected charges from the financial provider	<b>Binary:</b> 1 = yes, 0 = No	Same as above	Same as above
7. If lost money	<b>Binary:</b> 1 = yes, 0 = No	Same as above	Same as above

<b>OPERATIONAL FRAMEWORK – RELATIONSHIP BETWEEN FINANCIAL INCLUSION INDICATORS AND POVERTY INDICATORS</b>			
<b>INDICATORS OF FINANCIAL INCLUSION</b>	<b>MEASUREMENT</b>	<b>POVERTY/WELLBEING INDICATORS</b>	<b>MEASUREMENT</b>
8. If Registered a complaint	<b>Binary:</b> 1 = yes, 0 = No	Same as above	Same as above
9. If have a safe place to save money	<b>Binary:</b> 1 = yes, 0 = No	Same as above	Same as above
<b>C. USAGE</b>			
10. Use of different financial services – banks, mobile money, informal groups, SACCOs, insurance, MFIs.	<b>Binary:</b> 1 = yes, 0 = No	Same as above	Same as above
11. Frequency of use of the above mentioned financial services	<b>Categorical:</b> Daily, Weekly, Monthly, Less than once a month	Same as above	Same as above
12. Use of savings and credit	<b>Binary:</b> 1 = yes, 0 = No	Same as above	Same as above

*Table 0.4: Relationship between financial inclusion indicators and poverty indicators*

*Source: Derived from the FinAccess 2016 indicators*

The control variables will be age, education, sex and location. These are factors that can influence financial inclusion or not. For instance, persons aged under 16 years do not have national identity cards hence legally they cannot open bank accounts.

## **CHAPTER THREE**

### **METHODOLOGY**

#### **1.11 Introduction**

This chapter presents a description of the sources of data, sampling, and data analysis that were used in this study to yield the necessary conclusions of the relationship between financial inclusion and poverty to determine if financial inclusion can be used as a poverty indicator

#### **1.12 Sources of data**

The data source was the National FinAccess household survey 2016. This is the fourth survey since 2006 undertaken approximately every 3 years with other studies undertaken in 2006, 2009 and 2013. Reference will be made to the other studies, especially when there is need for trended comparisons. The surveys constitute an important tool for providing a better understanding of the financial inclusion landscape in line with the financial sector development agenda, as laid out in Kenya's Vision 2030, and a monitoring tool for progress under the government's Medium Term Plan (MTP) for the financial services sector. The surveys contain disaggregated data on key market segments, data on drivers of uptake and usage including attitudes, perceptions and needs as well as profiling the financial services landscape. The study is carried out by CBK, KNBS and FSD Kenya. The data contains variables relevant to the study objectives. These include financial product and service usage, awareness, experience and frequency of use, income sources, household possessions, key demographics and socio-economic aspects – age, sex, education level, number of household members, important life goals, shocks experienced and how deal with them, ability to get emergency money within three days, a secure place to keep money and distance from financial service providers.

#### **1.13 Sampling**

The FinAccess datasets are the main data source. The survey design is cross-sectional and can compare different population groups at a single point in time, allowing comparisons across different variables at the same time. The survey sample was designed to achieve a statistically valid, nationally representative sample of individuals aged 16 and above. The survey employed a three-stage cluster sample design. Stage 1 involved the selection of clusters from the sample

frame, stage 2 comprised the selection of households from each cluster and stage 3 was the selection of one individual from each household. Sample points “Clusters” were drawn-up based on the KNBS national household master sample frame, the National Sample Surveys and Evaluation Programme (NASSEP V). The survey interviewee was randomly selected at the household level using the Kish grid. A total of 13 domains (Regions) were demarcated according to similarities in key geographic, demographic and economic indicators. The target sample size for the survey was 10,008 with 8,665 interviews successfully completed representing an 87% success rate.

#### **1.14 Data analysis**

Descriptive analysis was employed for the data analysis using both measures of central tendencies and dispersion as well as the use of statistical tools using SPSS for logistical regressions and application of Principal Component Analysis (PCA), In this study, the independent variable was financial inclusion while the dependent variables were the control variables of age, education, location and sex. The chi-square was employed to determine the strength of association. The financial inclusion indicators that were used are **Access** - proximity to financial access points, availability of financial solutions, channels for financial services, barriers to access – awareness, trust, cost; **Quality** – convenience, security – trust, consumer protection – loss of money and **Usage** - products – what products are used, patterns – frequency of use, behaviours – saving, borrowing behaviour. The poverty indicators are broadly divided into education and financial literacy, possession of household assets (wealth quintile), dealing with shocks and psychological well-being.

## CHAPTER FOUR

### Financial inclusion as a poverty proxy indicator: Findings and discussions

#### 1.15 Introduction

This section provides a presentation of study results in line with the objectives. The results have also been discussed in this section. The analysis will look at the poverty level (income) against each control variable (education, livelihood source, area and age) against the selected financial inclusion indicator (access, quality and usage). Comments will be made against each observation regarding the possibilities of the financial indicator being a poverty indicator. The observations will be summarised at the end against the characteristics of a good indicator. These characteristics include, direct, unambiguous, vary across groups, vary across areas, vary over time, should not be easily manipulated or blown off course by any unrelated developments, should be easy and not too costly to measure, should be easy to understand, it should be reliable and should be consistent with the data available and the data collection capacity.

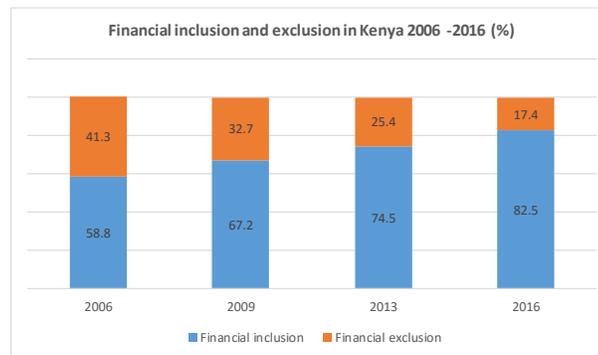
#### 1.16 Profile of the respondents in the survey

Selected Respondent Gender	%	N	Population distribution of the region	%	N
Male	48.4	10,220,641	<b>Region</b>		
Female	51.6	10,889,802	Nairobi	10.6	2,242,245
Total	100	21,110,443	Central	13.1	2,767,055
<b>Cluster type rural/urban</b>	<b>%</b>	<b>N</b>	Mombasa	2.9	621,671
Rural	63.4	13,374,884	Coast	5.9	1,245,532
Urban	36.6	7,735,559	Upper Eastern	1.1	241,950
Total	100	21,110,443	Middle Eastern	5.9	1,252,553
<b>Age Group</b>	<b>%</b>	<b>N</b>	Lower Eastern	7.6	1,604,141
18-25yrs	24.1	5,095,134	North Eastern	3.4	716,793
26-35yrs	29.6	6,252,329	Nyanza	13.9	2,944,224
36-45yrs	18.9	3,999,429	North Rift	2.9	615,278
46-55yrs	10.7	2,267,810	Central Rift	14.2	2,995,478
>55yrs	16.6	3,495,741	South Rift	7.8	1,642,393
Total	100	21,110,443	Western	10.5	2,221,130
<b>Education level of Respondent</b>	<b>%</b>	<b>N</b>	Total	100	21,110,443
None	13.9	2,925,987			
Primary	46.2	9,751,350			
Secondary	29.2	6,157,751			
Tertiary	10.8	2,275,354			
Total	100	21,110,443			

*Table 0.1: Profile of the FinAccess respondents analysed from the datasets*

### 1.17 Financial inclusion status in Kenya from 2005 to 2016

The rate of financial inclusion in Kenya has been growing from 58.8% in 2006 and 10 years later, it has grown to 82.5%. This is a difference of 23.7 points. (Figure 4.1)



**Figure 0.1: Financial inclusion and exclusion in Kenya from 2006 to 2016 (%)**

**Source: Calculated from the 2006, 2009, 2013 and 2016 FinAccess datasets**

This rate varies among different demographic levels as shown in table 4.2 below

The level of financial inclusion is highest among the 26 to 55 years old, mainly male. It increases with wealth and education in urban areas. High level of financial exclusion is among the rural population, the poorest, those with little or no education and the youngest and the oldest population. A good indicator should vary over time and show variations among different groups and this is as displayed in table 4.2 below.

	Financial Inclusion	Financial Exclusion		Financial Inclusion	Financial Exclusion
<b>Age</b>			<b>Area</b>		
18-25yrs	76.9	23.1	Urban	90.4	9.5
26-35yrs	89.1	10.8	Rural	68.9	22
36-45yrs	87.7	12.4	<b>Region</b>		
46-55yrs	85	14.9	North Eastern	47.7	52.2
>55yrs	71.7	28.4	North Rift	57.4	42.5
<b>Sex</b>			Upper Eastern	66.4	33.6
Female	81.4	18.6	Coast	76.5	23.6
Male	83.8	16.2	Western	79.3	20.6
<b>Wealth quintile</b>			Middle Eastern	81.1	18.9
Poorest	58	42	Nyanza	81.3	18.7
Second Poorest	79.4	20.6	South Rift	82.6	17.4
Middle	86.9	13.1	Central Rift	83.3	16.7
Second Wealthiest	92.7	7.2	Lower Eastern	85.9	14.1
Wealthiest	95.8	4.3	Mombasa	89.6	10.5
<b>Education level</b>			Central	91	9
None	53.8	46.2	Nairobi	95.8	4.2
Primary	81.9	18.1			
Secondary	91.4	8.6			
Tertiary	98.30	1.60			

*Table 0.2: Financial inclusion and exclusion (%) in 2016*

*Source: Calculated from the FinAccess 2016 datasets*

### 1.18 Financial inclusion indicators against wealth quintiles

From table 4.3 below, Access as a financial indicator, the poorer quintiles would take longer than the wealthier to reach their closest financial service point. Almost all the wealthiest (94%) in the population have at least one financial instrument compared to 56% of the poorest quintile. The reverse also indicates the same, 6% of the wealthiest do not have a financial instrument compared to 44% of the poorest who are excluded. In terms of awareness, the poorest are less aware of the financial terms compared to the wealthiest – the wealthier one is, the more aware of the financial terms. Distance increases inversely with wealth. See table 4.3

	Poorest	Second Poorest	Middle	Second Wealthiest	Wealthiest
<b>A. ACCESS</b>					
<b>1. Distance from a financial service provider</b>					
Under 10 minutes	16%	26%	36%	55%	72%
About 10 to 1 hour	67%	67%	60%	42%	27%
Over 1 hour	17%	7%	4%	3%	0%
<b>2. Uses at least one formal or informal financial instrument</b>					
At least one financial instrument	56%	76%	84%	90%	94%
Excluded	44%	24%	16%	10%	6%
<b>3. Awareness of financial terms</b>					
Savings account	52%	76%	85%	91%	97%
Interest	40%	65%	71%	83%	93%
Shares	39%	66%	73%	83%	92%
Collateral	11%	15%	19%	27%	48%
Guarantor	28%	46%	58%	72%	82%
Investment	27%	50%	57%	75%	91%
Inflation	15%	21%	28%	37%	59%
Pension	37%	59%	66%	76%	90%
Mortgage	7%	12%	22%	36%	68%

**Table 0.3: Access financial indicators against wealth quintiles**

For Quality related financial indicators, there does not seem to be a clear-cut difference among the different wealth quintiles as seen in Table 4.4 below. All wealth quintiles have a relatively high score on having a safe place to save money. The wealthiest experience more unexpected charges than the other wealth quintiles. They also seem to register more complaints with banks compared to those in the lowest wealth quintile. However, the scores of the latter and former are relatively low.

<b>B. QUALITY</b>	Poorest	Second Poorest	Middle	Second Wealthiest	Wealthiest
If have a safe place to save money (yes)	82%	88%	90%	94%	97%
If experiences unexpected charges from the financial provider	6%	13%	14%	14%	22%
If lost money in a bank	6%	7%	7%	7%	7%
If registered a complaint about a bank	3%	11%	10%	10%	14%
If ever lost money in mobile money	9%	11%	12%	15%	18%

**Table 0.4: Quality financial indicators against wealth quintiles**

**Source: Derived from the FinAccess 2016 datasets**

When it comes to usage indicators, the poorest wealth quintile has the lowest use of financial services and solutions. Informal group usage does not vary much among the top four quintiles.

There is a clear distinction in the use of mobile money among the five groups, with the wealthiest using it most frequently (daily). The reverse compares the same, the poorest use their mobile money accounts less often than the wealthiest. MFI use is low even among the wealthiest. The use of Insurance among the wealthiest gaps that of the poorest with 42% while pension use gap between the wealthiest and the poorest is 48%.

C. USAGE	Poorest (P)	Second Poorest	Middle	Second Wealthiest	Wealthiest (W)	Gap between wealthiest and poorest (W-P)
Use of different financial services – banks, mobile money, informal groups, SACCOs, insurance, MFIs, savings, credit- and the frequency of using mobile money						
Bank Usage	9%	22%	32%	53%	77%	68%
Insurance Usage (IRA and NHIF)	3%	9%	15%	27%	45%	42%
Mobile Money Usage	38%	64%	76%	87%	92%	54%
MFI Usage	1%	3%	3%	5%	7%	6%
SACCO Usage	3%	7%	12%	16%	27%	24%
Informal Group Usage	26%	41%	46%	47%	47%	21%
Savings usage	11%	18%	21%	24%	27%	16%
Credit usage	14%	18%	20%	21%	27%	13%
Investment usage	7%	11%	19%	22%	42%	35%
Pension usage	3%	7%	12%	27%	51%	48%
Daily use of mobile money	3%	7%	14%	24%	53%	50%
Less often use of mobile money	30%	20%	16%	10%	5%	-26%

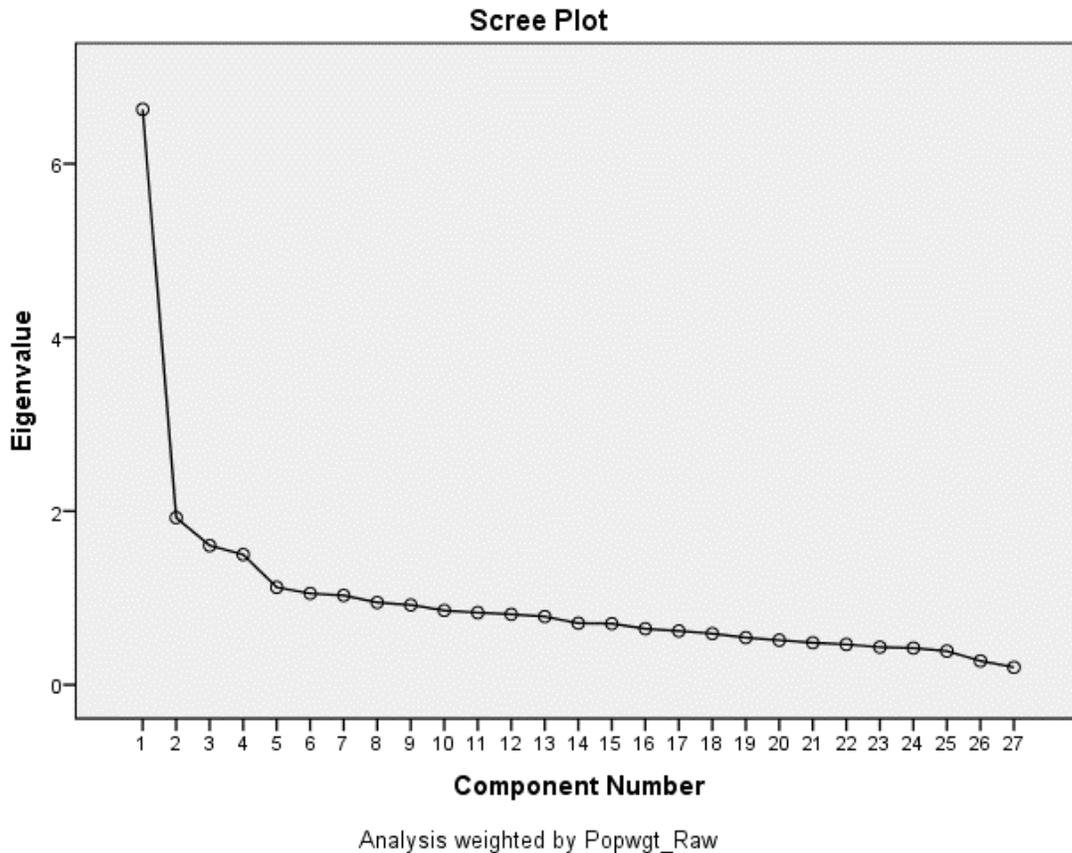
**Table 0.5: Usage financial indicators against wealth quintiles**

All the above variables are important (Annex 2) and interrelated at various degrees as can be observed in the correlation matrix Annex 3. The highest correlation is between mobile money usage and included/excluded (.739) while the lowest correlation has been observed between having a safe place to keep money with any of the other variables. Relatively high correlation has also been observed between exclusion & inclusion/exclusion, awareness of shares & interest and savings usage and informal group usage. Financial inclusion is multidimensional.

### 1.19 Ideal poverty proxy indicator determination

Several financial indicators have been selected to consider their association with poverty. These indicators are interrelated. To bring out the strong indicators, the Principal Component Analysis (PCA) was applied. The PCA is a method of summarising data showing the principal components, the underlying structure in the data. "...The principal components are the directions where there is the most variance, the directions where the data is most spread out..."

(Dallas,2013). “...The main purposes of a principal component analysis are the analysis of data to identify patterns and finding patterns to reduce the dimensions of the dataset with minimal loss of information...” (Raschka, 2014). It will be used to select the most useful and identify the most important financial inclusion indicators from all the above indicators (Tables 4.3, 4.4 and 4.5) and identify the common financial inclusion themes (Haynes and Lamb, 2010)



**Figure 0.2: Determining components with highest variability: Scree plot:**

An eigenvalue is a number, telling you how much variance there is in the data in that direction. In the example above the eigenvalue is a number telling us how spread out the data is on the line. A scree plot displays the eigenvalues associated with a component or factor in descending order versus the number of the component or factor (the 27 selected financial inclusion indicators). The eigenvector with the highest eigenvalue is therefore the principal component. There are 7 Eigenvalues (where there is variation in the line graph until it starts

straightening). The 7 components that would be needed for the analysis. The factors that remain explain negligible proportion of the variability and are thus likely to be unimportant.

## 1.20 Categorising the indicators

The component score co-efficient provides scores within each of the 7 components for each of the indicators. The higher the score the stronger the chances that the indicator is a strong financial inclusion variable. The components have been classified in a manner that provides the expected characteristics. The selection of the characteristics has been guided by the highest score in each column (component).

Component Score Coefficient Matrix							
	Component						
	1	2	3	4	5	6	7
Distance from the closest financial service point	-.145	.190	.158	-.146	-.042	-.250	.394
Include or excluded	-.071	.374	-.020	-.038	.010	-.090	-.102
Awareness of savings accounts	.316	-.029	-.172	-.040	-.004	-.033	-.003
Awareness of interest	.330	-.095	-.119	-.028	.000	.002	-.016
Awareness of shraes	.316	-.077	-.129	-.018	-.007	.000	-.004
Awareness of collateral	-.088	-.036	.434	-.097	.019	.085	-.079
Awareness of Guarantor	.164	-.045	.060	.003	.000	.046	-.066
Awareness of investment	.230	-.068	.041	-.048	.003	-.042	.011
Awareness of inflation	-.045	-.045	.407	-.023	.004	.003	-.125
Awareness of pension	.162	-.002	.044	-.037	.000	-.028	-.018
Awareness of mortgage	-.060	-.011	.354	.022	.023	-.058	-.014
If have a safe place to keep money	-.013	-.127	-.016	.058	-.008	.082	.010
If experienced unexpected charges from the bank	-.008	-.001	.014	.025	.470	-.012	-.031
If lost money in the bank	.021	.001	-.041	-.003	.487	-.008	.015
If registered a complaint with the bank	-.029	.025	.045	-.033	.441	-.018	.004
If lost money on mobile money	.069	-.078	-.235	.035	.064	-.022	.608
Bank usage	-.050	.127	.043	.075	-.032	-.029	.205
Insurance usage	-.050	.025	.009	.320	-.027	-.100	.084
Mobile Money Usage	-.031	.334	.015	-.039	.009	-.178	-.085
MFI Usage	-.020	-.104	.051	-.147	-.026	.617	.049
SACCO Usage	.004	-.069	-.114	.438	-.014	.012	-.015
Informal Group Usage	-.070	.205	-.098	-.057	.030	.285	-.022
Savings Usage	-.051	.280	-.067	-.017	-.005	.056	.060
Credit Usage	-.044	.045	.000	.061	-.005	.332	-.069
Investment Usage	-.022	-.105	-.035	.337	.033	.246	-.132
Pension Usage	-.049	-.035	-.027	.448	.005	-.241	-.048
Frequency of using mobile money	-.032	-.096	.050	-.053	-.044	.178	.490

Extraction Method: Principal Component Analysis.

**Table 0.6: The strength of association of the indicators**

The strongest indicators for component one (1) are associated with the awareness of financial terms – awareness of interest, savings account, shares and investments. The strongest indicators for component two (2) are financially included and use of mobile money usage,

savings usage, distance from financial service points and informal group usage. Components three (3) are indicators associated with the awareness of financial terminology whose product use is complex. These terms are collateral, inflation and mortgage. For component four (4), the strongest association is with insurance for the future. The indicators are pension use, insurance, SACCO use and investments. Component five (5) relates to consumer protection issues which cover if have lost money in a bank, if ever reported a problem and if experienced unexpected charges. These focus on bank users. The key components in component six (6) are related to credit. These components are MFI and credit usage. The strong variables in the final component seven (7) are if lost money, distance from a financial service provider and the frequency of using mobile money services. There is no clear classification of these variables.

### 1.21 Association of inclusion indicators with poverty

Logical regression has been used to determine how the different models can predict which segment of the population is poor or not poor, the relative importance of each predictor and if there are interactions among the predictors. It will also help to determine how good the models are at classifying cases for which the outcome is known. Sixteen (16) models have been generated through various combinations of the factors with the control variables. The control variables are level of education, regions, urban/rural, gender and age. These are listed in table 4.7 below.

The poverty indicator in this analysis is categorised as poor and non-poor. The poor comprises the population in the bottom 2 wealth quintiles while the non-poor comprise the top 3 wealth quintiles from the FinAccess dataset. This is the dependent variable.

Dependent Variable Encoding	
Original Value	Internal Value
Poor	0
Non Poor	1

*Table 0.7: Dependent variable - poor and non-poor*

Categorical Variables Codings							
		Frequency	Parameter coding				
			(1)	(2)	(3)	(4)	(5)
Former provinces	Nairobi	510	1.000	0.000	0.000	0.000	0.000
	Coast	1014	0.000	1.000	0.000	0.000	0.000
	Central and Eastern	2761	0.000	0.000	1.000	0.000	0.000
	Rift Valley	2154	0.000	0.000	0.000	1.000	0.000
	Nyanza and Western	1653	0.000	0.000	0.000	0.000	1.000
	North Eastern	573	0.000	0.000	0.000	0.000	0.000
Education level of Respondent	None	1561	1.000	0.000	0.000		
	Primary	3865	0.000	1.000	0.000		
	Secondary	2416	0.000	0.000	1.000		
	Tertiary	823	0.000	0.000	0.000		
age by working class	Under 30 years	3866	1.000	0.000	0.000		
	31 to 50 years	3111	0.000	1.000	0.000		
	51 to 60 years	731	0.000	0.000	1.000		
	61 years and above	957	0.000	0.000	0.000		
A9 Cluster type rural/urban	Rural	4852	1.000				
	Urban	3813	0.000				
Selected Respondent Gender	Male	3384	1.000				
	Female	5281	0.000				

**Table 0.8: Variables used in analysis and their coding**

The reference groups have all codes as zero. The reference group for provinces is Northern Eastern, for education level, it is tertiary, for age those aged of 61 years (retirees), cluster would be urban and the gender female.

		% predicted correctly by the model		
		Poor	Non poor	Overall
Factor 1 (awareness of common financial terms)	Model 1	41.7	87.3	69
Factor 2 (use of financial solutions)	Model 2	36.5	87.6	67.1
Factor 3 (awareness of complex financial terminology)	Model 3	20	83	57.8
Factor 4 (insurance for the future)	Model 4	0.5	98.5	59.3
Factor 5 (consumer protection)	Model 5	0	100	60
Factor 6 (credit use)	Model 6	0	100	60
Factor 7 (no clear classification)	Model 7	17.7	87.8	59.8
Factor 1,2,3,4,5	Model 8	64	80.2	73.7
Factor 1 with control variables	Model 9	69.6	81.4	76.7
Factor 2 with control variables	Model 10	70.8	81.9	77.5
Factor 3 with control variables	Model 11	69	82.5	77.1
Factor 4 with control variables	Model 12	69.4	82.1	77
Factor 5 with control variables	Model 13	70.3	81.2	76.8
Factor 6 with control variables	Model 14	69.9	81.4	76.8
Factor 7 with control variables	Model 15	69.1	82.2	77
Factors 1,2,3,4,5 with control variables	Model 16	74.4	83.1	79.6

**Table 0.9: Prediction of the chances of being poor or non-poor**

The percentage correct shows the percentage of the correct prediction of each of the models.

For instance, for model 1, 69% of the population was predicted correctly with 41.7% poor

correctly predicted as poor while 87.3% was predicted as non-poor correctly. Model 1 and model 2 have the highest overall correct percentage prediction while model 3 has the lowest percentage prediction. The addition of more variables increases the percentage of correct classification.

		Co-efficient (B)	Standard Error (S.E.)	(Wald chi-square test) Wald	(Degrees of freedom) df	Sig.	Exp(B) Odds Ratio
Factor 1 (awareness of common financial terms)	Model 1	-0.625	0	1823326.61	1	0	0.535
Factor 2 (use of financial solutions)	Model 2	-0.591	0	1647794.28	1	0	0.554
Factor 3 (awareness of complex financial terminology)	Model 3	-0.487	0	1033061.4	1	0	0.614
Factor 4 (insurance for the future)	Model 4	-0.336	0.001	412336.426	1	0	0.714
Factor 5 (consumer protection)	Model 5	0.006	0	210.626	1	0	1.006
Factor 6 (credit use)	Model 6	0.004	0	68.96	1	0	1.004
Factor 7 (no clear classification)	Model 7	-0.415	0	759257.446	1	0	0.661
Factor 1 with control variables	Model 8	-0.272	0.001	208149.752	1	0	0.762
Factor 2 with control variables	Model 9	-0.396	0.001	503271.491	1	0	0.673
Factor 3 with control variables	Model 10	-0.232	0.001	135630.455	1	0	0.793
Factor 4 with control variables	Model 11	-0.295	0.001	164987.101	1	0	0.745
Factor 5 with control variables	Model 12	0	0.001	0.378	1	0.539	1
Factor 6 with control variables	Model 13	-0.056	0.001	9787.892	1	0	0.946
Factor 7 with control variables	Model 14	-0.237	0.001	160745.631	1	0	0.789
FAC1_1		-0.518	0.001	630098.349	1	0	0.596
FAC2_1		-0.56	0.001	872531.784	1	0	0.571
FAC3_1		-0.494	0.001	484723.697	1	0	0.61
FAC4_1		-0.49	0.001	340882.269	1	0	0.613
FAC5_1		-0.037	0.001	1432.794	1	0	0.964
FAC6_1		-0.049	0.001	6666.251	1	0	0.952
FAC7_1		-0.417	0.001	402712.422	1	0	0.659
* P<0.001, **P<0.05, ***P<0.1							

**Table 0.10: Relationship among the different variables**

“...The B co-efficient tells about the relationship between the independent variables and the dependent variables. A positive correlation coefficient means that as the value of one variable increases, the value of the other variable increases; as one decreases the other decreases. A negative correlation coefficient indicates that as one variable increases, the other decreases, and vice-versa...” (Webster Education, 2016). These levels vary among the different models with 11 out of the 14 selected variables having a negative B co-efficient.

“...The Wald statistic is the crucial value because it tells us whether the B coefficient is significantly different from 0. If the Wald is significantly different from 0, then we can assume that the model is making a significant contribution to the prediction of being poor or non-poor.

All the models have values different from 0 but the difference for model 6 has the lowest difference...” (Webster Education, 2016) (Table 4.10)

All the models contain components that are significant. Lowest significance is observed in the model 5. The various dimensions of financial inclusion are important and should be considered while using it as a proxy poverty indicator.

**1.22 Variations among the various wealth levels**

The 1<sup>st</sup> three models have been selected to demonstrate the variations among the different wealth levels. The first model comprises level of awareness of different financial terms, the second model comprises the use of financial services while the third model is about the knowledge of complex financial terms.

**Percentile Group of FAC1\_1 \* Wealth Quintile Crosstabulation**

Count		Wealth Quintile					Total
		Poorest	Second Poorest	Middle	Second Wealthiest	Wealthiest	
Percentile Group of FAC1_1	1	587173	1025600	1038871	1164493	650819	4466956
	2	392219	746187	993292	1096305	1237128	4465131
	3	437539	637002	704231	1046909	1640840	4466521
	4	965524	955487	1029035	702251	813582	4465879
	5	2086367	1100478	700649	459025	120036	4466555
Total		4468822	4464754	4466078	4468983	4462405	22331042

**Table 0.11: Ranking of model 1 against the wealth quintiles**

As the ranking increases from 1 to 5, the number of the poorest increases, with at rank one, having 587,176 poorest while at rank 5, there are 2,086,367 of the poorest here. For the wealthiest ranks 1 and 2 have 1,887,947 while rank 5 has 120,036 of the wealthiest. Variations are observed within the various quintiles. For instance, for the second poorest quintile, those ranked 4<sup>th</sup> are higher than those ranked 2<sup>nd</sup>.

Percentile Group of FAC2\_1 \* Wealth Quintile Crosstabulation

			Wealth Quintile					Total
			Poorest	Second Poorest	Middle	Second Wealthiest	Wealthiest	
Percentile Group of FAC2_1	1	Count	491455	841881	953348	1164789	1014825	4466298
		% within Percentile Group of FAC2_1	11.0%	18.8%	21.3%	26.1%	22.7%	100.0%
		% within Wealth Quintile	11.0%	18.9%	21.3%	26.1%	22.7%	20.0%
	2	Count	488184	765097	983315	1052510	1175343	4464449
		% within Percentile Group of FAC2_1	10.9%	17.1%	22.0%	23.6%	26.3%	100.0%
		% within Wealth Quintile	10.9%	17.1%	22.0%	23.6%	26.3%	20.0%
	3	Count	572719	788040	953114	1018232	1135557	4467662
		% within Percentile Group of FAC2_1	12.8%	17.6%	21.3%	22.8%	25.4%	100.0%
		% within Wealth Quintile	12.8%	17.7%	21.3%	22.8%	25.4%	20.0%
	4	Count	978177	1008003	846557	784608	848146	4465491
		% within Percentile Group of FAC2_1	21.9%	22.6%	19.0%	17.6%	19.0%	100.0%
		% within Wealth Quintile	21.9%	22.6%	19.0%	17.6%	19.0%	20.0%
	5	Count	1938286	1061732	729744	448844	288534	4467140
		% within Percentile Group of FAC2_1	43.4%	23.8%	16.3%	10.0%	6.5%	100.0%
		% within Wealth Quintile	43.4%	23.8%	16.3%	10.0%	6.5%	20.0%
Total		Count	4468821	4464753	4466078	4468983	4462405	22331040
		% within Percentile Group of FAC2_1	20.0%	20.0%	20.0%	20.0%	20.0%	100.0%
		% within Wealth Quintile	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 0.12: Ranking of model 2 against the wealth quintiles

The same applies to the model 2, 11% of the poorest are ranked 1 and almost half of them (43.4%) are ranked five. For the wealthiest, 22.7% are ranked 1 while only 6.5% are ranked 5. As in model 1, variations within the wealth quintiles are observed. For instance, for the middle wealth quintile despite being a general decline in the numbers as the rank increases, rank 2 has 22% of the middle quintile, slightly higher than those ranked 1.

Percentile Group of FAC3\_1 \* Wealth Quintile Crosstabulation

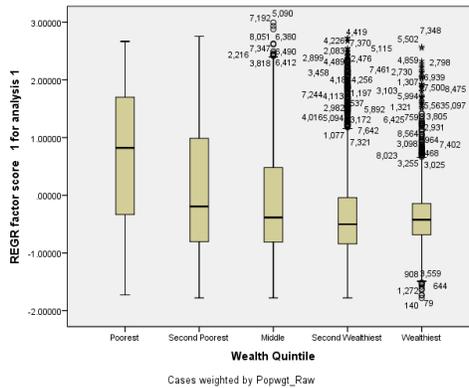
			Wealth Quintile					Total
			Poorest	Second Poorest	Middle	Second Wealthiest	Wealthiest	
Percentile Group of FAC3_1	1	Count	294318	434876	643142	1041684	2051828	4465848
		% within Percentile Group of FAC3_1	6.6%	9.7%	14.4%	23.3%	45.9%	100.0%
		% within Wealth Quintile	6.6%	9.7%	14.4%	23.3%	46.0%	20.0%
	2	Count	1005619	696228	812461	925693	1026917	4466918
		% within Percentile Group of FAC3_1	22.5%	15.6%	18.2%	20.7%	23.0%	100.0%
		% within Wealth Quintile	22.5%	15.6%	18.2%	20.7%	23.0%	20.0%
	3	Count	1502753	1025372	805531	669162	460182	4463000
		% within Percentile Group of FAC3_1	33.7%	23.0%	18.0%	15.0%	10.3%	100.0%
		% within Wealth Quintile	33.6%	23.0%	18.0%	15.0%	10.3%	20.0%
	4	Count	907277	1109406	1024930	901946	526083	4469642
		% within Percentile Group of FAC3_1	20.3%	24.8%	22.9%	20.2%	11.8%	100.0%
		% within Wealth Quintile	20.3%	24.8%	22.9%	20.2%	11.8%	20.0%
	5	Count	758853	1198871	1180013	930498	397396	4465631
		% within Percentile Group of FAC3_1	17.0%	26.8%	26.4%	20.8%	8.9%	100.0%
		% within Wealth Quintile	17.0%	26.9%	26.4%	20.8%	8.9%	20.0%
Total		Count	4468820	4464753	4466077	4468983	4462406	22331039
		% within Percentile Group of FAC3_1	20.0%	20.0%	20.0%	20.0%	20.0%	100.0%
		% within Wealth Quintile	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 0.13: Ranking of model 3 against the wealth quintiles

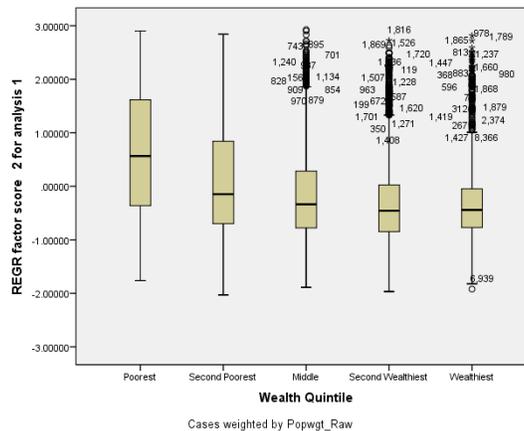
The same trend is noted also in model 3, higher ranking declines with the wealth quintile. 6.6% of the poorest are ranked 1<sup>st</sup> while 17% are ranked fifth. For the wealthiest it is 46% and 8.9%

respectively. There is a general decline in the numbers for the wealthiest as the rank increase. But just like the other models above, there is a slight break of the trend. Rank 4 has slightly more of the wealthiest than rank 3 instead of the other way around.

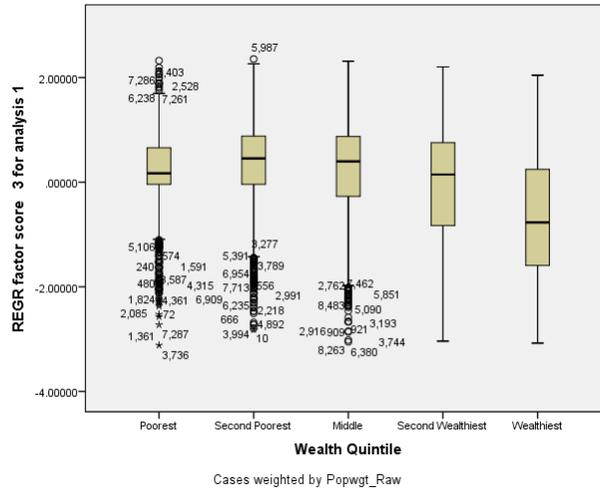
The reaction to the various models varies as can be seen by the different scores obtained for the different quintiles as the ranking changes. This indicates that within the wealth quintiles there are individuals who have characteristics that are not in line with the quintiles within the specific group they are in. For instance, within the wealthiest wealth quintile there are individuals who possess the characteristics of the poor. In addition, the box plots below demonstrate that the reaction to the indicator varies with individuals.



**Figure 0.3: Box Plot for model 1**



**Figure 0.4: Box Plot for model 2**



**Figure 0.5: Box plot for model 3**

The box plots confirm that there are outliers in all the selected models. For model one and two, these are for the top three wealth quintiles while for the model 3, it is for the bottom two wealth quintiles. The indicators are thus not very pure. The median score (dark line in the middle of the boxes) is higher among the poorer quintiles. This shows that the level of exclusion is higher among these quintiles.

The dependent variables, age group, marital status (picked because of its importance), age and region when tested for whether they have any effect show that these are significant meaning that they contribute to whether an individual will be poor or not poor.

Each aspect in the model is tested to determine if it has any effect. Any term with significance values of less than 0.05 are considered to have some discernible effect. Each of the terms selected contribute to the effects of the model as shown in table 4.14.

**Tests of Model Effects**

Source	Type III		
	Wald Chi-Square	df	Sig.
(Intercept)	398411.133	1	.000
agegroup	1751342.686	5	.000
maritalgp	160463.789	3	.000
wealth_quint	1856069.914	4	.000
agewc	120371.183	3	.000
formprov	572609.895	5	.000

Dependent Variable: REGR factor score 2 for analysis 1  
 Model: (Intercept), agegroup, maritalgp, wealth\_quint, agewc, formprov

***Table 0.14: Effect of dependent variables on non-poor or poor***

## **CHAPTER 5**

### **Summary of findings, conclusions and recommendations**

#### **1.23 Introduction**

This section summarizes the findings and basing on the same, presents conclusions and recommendations of the assessment. The study aimed at assessing to what extent financial inclusion is related to poverty and determine whether it can be used as an indicator to monitor poverty levels at the household level. Specifically, it aimed to determine the association between the financial inclusion indicator and poverty.

#### **1.24 Summary of findings**

The assessment proves that financial inclusion could be used as a proxy indicator for poverty. A good poverty indicator should be direct, unambiguous measures of progress, vary across groups, areas and over time, have a direct link with interventions, relevant to policy making, consistent with the decision-making cycle, not easily manipulated or blown off course by unrelated developments, easy and not too costly to measure, easy to understand, reliable and consistent with data available and the data collection capacity. A proxy indicator should fit the characteristics of a good indicator.

Financial inclusion in Kenya has changed over the years and this is tracked approximately every three years by the government of Kenya. The financial inclusion levels have increased from 58.8% in 2006 to 82.2% in 2016. The levels of inclusion vary across different demographics and socio economic classifications such as age, region, education levels, wealth quintile and gender. The measure of financial inclusion is directly measurable in a simple manner and is done at least every three years.

Financial inclusion, just like poverty, is a multidimensional measure. The study focuses on three key financial indicator measures – access, usage and quality. The fourth aspect, welfare, was not covered as the source for the data for analysis did not have direct measures of welfare. There was a clear difference in access and usage indicators among the different wealth levels but no clear

difference in the quality related financial inclusion indicators, an indication that indicators associated with this may not be good poverty proxy indicators. Each of these three measures have several indicators classified under each. The analysis looked at 27 indicators all of which were observed to be correlated at different degrees. The highest correlation was noted between mobile money usage and included/excluded while the lowest correlation has been observed between having a safe place to keep money with any of the other variables. The analysis then explored which would be the most useful and important financial inclusion indicators from all the 27 indicators and 7 components were derived. Each of these components had distinct comparisons. The next step of analysis was to generate different models using the control variables of level of education, regions, urban/rural, gender and age. These were used to determine how the different models can predict which segment of the population is poor or not poor and which of these was the best predictor. The predictions varied among the various models but all were significant predictors. It was observed that the more variables were incorporated into the models, the stronger the prediction of the level of poverty.

Further analysis was done on the models to determine how pure the models were in predicting poverty. Outliers were identified in different models. For instance, within the wealthiest wealth quintile there are individuals who possessed the characteristics of the poor. Lastly, it was that the different demographics and socio-economic characteristics of the population be tested to know whether they influenced whether an individual would be poor or not poor. Specifically, age, marital status, level of education and region where they live were selected. They all showed that they do contribute to whether an individual will be poor or not poor.

### **1.25 Conclusion**

The models can be used as poverty proxies because they possess characteristics that are ideal to be indicators. The models are significantly associated with financial inclusion or exclusion variables and these can be differentiated. The financial inclusion factors can act as good discriminators between poor and non-poor, even though they are not pure as seen by the outliers. One who is financially included could mean that one is wealthier or less poor than one who is financially excluded. The study noted that for the financial indicators to work better, they would need to take into consideration other variables of the population such as level of education, age, location and gender. The association is still stronger even if control variables are included. As

no single indicator can be used to determine financial inclusion as the concept is multi-dimensional the indicator would act better as a poverty proxy indicator as opposed to a direct poverty indicator. Financial inclusion in Kenya has been changing over time because of various interventions driven by both the public and private sector. A good poverty indicator should have a direct link with interventions and relevant to policy making. The demonstration of this was beyond the scope of the study but the background information and literature review covered this. In addition, Financial inclusion in Kenya is measured regularly by the government of Kenya and the measures are easily obtained, simple to measure and are not costly to collect. The study looked at three out of four aspects of financial inclusion – Access, Usage and Quality. The Welfare aspect was not considered. Out of the 3 aspects analysed, Quality did not come out strongly as an indicator to clearly differentiate between being poor or non-poor.

### **1.26 Recommendations**

The study has come up with recommendations for policy makers and additional research. National poverty studies in most developing countries like Kenya are done after a long period for as long as a decade in Kenya, for instance. These in most cases leave policy makers, researchers, the private sector and development practitioners with no option but to use outdated information. National financial inclusion studies, which are easier and less costly to undertake, are being undertaken more frequently and can be used as proxy poverty indicators. These can support the government to track its development achievements both locally and internationally such as the SDGs more regularly.

However, more needs to be studied to determine which would be the most ideal indicators to use. The indicators had several outliers and more understanding of these is important to consider before they can be conclusively considered as proxy poverty measure. This study looked at various indicators which were picked because they were easily available from the datasets. The financial inclusion aspects that were studied were Access, Usage and Quality. The aspect of Welfare was not explored and this should be studied deeply to clearly determine the direct linkage of financial inclusion to improving the welfare of the population. This will also provide more information on how best to group the different levels of poverty. In addition, the aspect of quality did not come out strongly as a good discriminator or being poor or non-poor, hence more

analysis on this needs to be done to determine if it makes sense to reconsider the inclusion of the aspect in using financial inclusion as proxy poverty indicator.

## References

- ALEMAYEHU G., JONG N., MWABU G. AND MWANGI S. (2005) *Determinants of Poverty in Kenya: A Household Level Analysis*. University of Connecticut, University of Nairobi and Yale University. Available from [http://digitalcommons.uconn.edu/cgi/viewcontent.cgi?article=1050&context=econ\\_wpapers](http://digitalcommons.uconn.edu/cgi/viewcontent.cgi?article=1050&context=econ_wpapers) (Accessed on 15<sup>th</sup> May 2016)
- ALLIANCE FOR FINANCIAL INCLUSION (2011), *The Maya Declaration*. Third AFI Global Policy Forum, Riviera Maya, Mexico, 28 to 30 September 2011. Available from [http://www.afi-global.org/sites/default/files/mayadeclaration\\_30sep2011.pdf?op=Download](http://www.afi-global.org/sites/default/files/mayadeclaration_30sep2011.pdf?op=Download) (Accessed on 13<sup>th</sup> July 2016)
- AMARTYA S. (1987) *Capability and Well-Being*. Master of Trinity College, Cambridge, Dublin, Ireland. Available from <http://existencia.org/files/alt-eco/quality.pdf> (Accessed on 15<sup>th</sup> May 2016)
- AMIDŽIC, G., MASSARA, A. AND MIALOU, A (2013) *Assessing Countries' Financial Inclusion Standing - A New Composite Index*, Working Paper No. 14/36, International Monetary Fund (IMF). Available from <https://www.imf.org/external/pubs/cat/longres.aspx?sk=41385.0> (Accessed on 15<sup>th</sup> May 2016)
- ANGELUCCI, M., KARLAN, D. AND ZINMAN, J. (2013) *Microcredit Impacts: Evidence from a Randomized Microcredit Program Placement Experiment by Compartamos Banco*, American Economic Journal: Applied Economics 2015, 7(1): 151–182
- ATTANASIO O., AUGSBURG, B., FITZSIMONS, H., HAAS, R., AND HARMGART, H (2011) *Group lending or individual lending? Evidence from a randomised field experiment in Mongolia*. European for Reconstruction and Development, London, UK. Available from <http://www.ebrd.com/downloads/research/economics/workingpapers/wp0136.pdf> (Accessed on 15<sup>th</sup> May 2016)

- AYAKO, A.B. (1994) *The first Welfare Monitoring Survey, Draft Basic Report*, Ministry of Planning and National Development, Nairobi. Available from <http://catalog.ihnsn.org/index.php/catalog/3708>
- AYYAGARI, M., BECK, T. AND HOSEINI, M., (2013) *Finance and Poverty: Evidence from India*, World Bank, DC Washington, USA. Available from: [http://r4d.dfid.gov.uk/pdf/outputs/ESRC\\_Dfid/61070\\_Finance\\_Poverty\\_India.pdf](http://r4d.dfid.gov.uk/pdf/outputs/ESRC_Dfid/61070_Finance_Poverty_India.pdf) (Accessed on 15th May 2016)
- BECK, T., DEMIRGÜÇ, A., KUNT, A. AND LEVINE, R. (2007) *Finance, Inequality and the Poor*, World Bank, DC Washington, USA. Available from: [http://siteresources.worldbank.org/DEC/Resources/Finance\\_Inequality\\_and\\_the\\_Poor.pdf](http://siteresources.worldbank.org/DEC/Resources/Finance_Inequality_and_the_Poor.pdf) (Accessed on 15th May 2016)
- BANERGEER, A., DUFLO, E., GLENNERSTER, R. AND KINNAN, C. (2014) *The miracle of microfinance? Evidence from a randomized evaluation*, Department of Economics, Massachusetts Institute of Technology, Massachusetts, USA. Available from: <http://economics.mit.edu/files/5993> (Accessed on 1<sup>st</sup> November 2016)
- BANERGEER, A., DUFLO, E., GLENNERSTER, R. AND KINNAN, C. (2010) *The miracle of microfinance? Evidence from a randomized evaluation*, Department of Economics, Massachusetts Institute of Technology, Massachusetts, USA. Available from: <http://economics.mit.edu/files/4162> (Accessed on 1<sup>st</sup> November 2016)
- BLUMENSTOCK, B. (2013) *The Impact of mobile financial services in low- and lower middle-income countries*, Lirne Asia.
- BRUNE, L., GINÉ, X., GOLDBERG, J. AND YANG, D. (2010) *Commitments to Save: A Field Experiment in Rural Malawi*, Department of Economics, University of Michigan, USA.
- CARTER, M., AND JANZEN, S. (2013) *After the drought: The impact of microinsurance on consumption smoothing and asset protection*, The National Bureau of Economic Research, 1050 Massachusetts Avenue, Cambridge, MA 02138, UK.

- CENTRAL BANK OF KENYA, FINANCIAL SECTOR DEEPENING TRUST AND KENYA NATIONAL BUREAU OF STATISTICS (2016) 2016 *FinAccess Household Survey*, FSD Kenya.
- CULL, R., TILMAN, E., AND NINA, H., (2014) *Financial Inclusion and Development: Recent Impact Evidence*. Focus Note 92. Washington, D.C.: CGAP. Available from <https://www.cgap.org/sites/default/files/FocusNote-Financial-Inclusion-and-Development-April-2014.pdf> (Accessed on 1<sup>st</sup> November 2016)
- CREPON, B., DEVOTO, F., DUFLO, E. AND PARIENTE, W. (2011) *Impact of microcredit in rural areas of Morocco: Evidence from a Randomized Evaluation*, Department of economics, Massachusetts Institute of Technology, Massachusetts, USA. Available from: [http://www.crest.fr/ckfinder/userfiles/files/pageperso/Impact\\_of\\_microcredit\\_in\\_rural\\_areas\\_of\\_Morocco\\_2011\\_04.pdf](http://www.crest.fr/ckfinder/userfiles/files/pageperso/Impact_of_microcredit_in_rural_areas_of_Morocco_2011_04.pdf) (Accessed on 1<sup>st</sup> November 2016)
- DALAL, A., DE BOCK O., GELADE, W. and MATUL, M. (2013) *Why People Do Not Buy Micro -Insurance and What Can We Do About It*. Micro insurance Innovation Facility, International Labour Organisation (ILO), Geneva Switzerland.
- DEVOTO, F., DUFLO, E., CREPON, B., DUFLO, F. AND PARIENTE, W. (2014) *Estimating the impact of microcredit on those who take it up: Evidence from a randomized experiment in Morocco*, Massachusetts Institute of Technology(MIT), Department of Economics, Massachusetts, USA, Available from <http://economics.mit.edu/files/6659> (Accessed on 15th May 2016)
- DUPAS, P. AND ROBINSON, J. (2013a) Why Don't the Poor Save More? Evidence from Health Savings Experiments, *American Economic Review*, USA. Available from [http://web.stanford.edu/~pdupas/DupasRobinson\\_HealthSavings.pdf](http://web.stanford.edu/~pdupas/DupasRobinson_HealthSavings.pdf) (Accessed on 15th May 2016)
- ENVIRONMENTALLY AND SOCIALLY SUSTAINABLE NETWORK (1996) *Kenya: Participatory Poverty Assessment*, Social Development Notes. Available from [http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2003/12/30/000160016\\_20031230145125/Rendered/PDF/273860sdn260see0also018209.pdf](http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2003/12/30/000160016_20031230145125/Rendered/PDF/273860sdn260see0also018209.pdf) (Accessed on 15<sup>th</sup> May 2016)

- ERICA, F., PANDE, R., PAPP, J. AND RIGOL., N. (2012) *Does the Classic Microfinance Model Discourage Entrepreneurship Among the Poor? Experimental Evidence from India*, Department of Economics, Duke University 213 Social Sciences Building, Box 90097 Durham, USA.
- FINANCIAL SECTOR DEEPENING TRUST (2016) *2016-2020 Strategic Plan*. FSD Kenya, Nairobi, Kenya.
- FOOD AND AGRICULTURE ORGANISATION (2005) *Impact of policies on poverty: The Definition of Poverty Module 005*. Food and Agriculture Organization of the United Nations, FAO Rome, Italy. Available from [http://www.fao.org/docs/up/easypol/312/povanlys\\_defpov\\_004en.pdf](http://www.fao.org/docs/up/easypol/312/povanlys_defpov_004en.pdf) (Accessed on 15th May 2016)
- GOVERNMENT OF KENYA (2013) *Sector Plan for Financial Services 2013 -2017 Kenya Vision 2030*. Ministry of Devolution and Planning, Nairobi, Government Printers, Kenya
- GRAMEEN FOUNDATION, INDIA (2012) *Microfinance “A poverty lens on financial inclusion” based on a representative state-wide study of microfinance in Karnataka*. C 406, Nirvana Courtyard, Nirvana County, Sector 50, Gurgaon 122001, India
- HAUGHTON, J. AND KHANDKER, S. (2008) *Handbook on Poverty and Equality*. The World Bank 1818 H Street, NW, Washington, DC 20433
- HAYENS, M. AND LAMB, K. (2016) *A User-Friendly Demonstration of Principal Components Analysis as a Data Reduction Method”* R. Tarleton State University and Midwestern State University. Available from [http://www.zeigler-hill.com/uploads/7/7/3/2/7732402/psy\\_512\\_logistic\\_regression.pdf](http://www.zeigler-hill.com/uploads/7/7/3/2/7732402/psy_512_logistic_regression.pdf) (Accessed on 4th September 2016)
- INTERNATIONAL FUND FOR AGRICULTURAL DEVELOPMENT (2015) *Investing in rural people in Kenya: Eradicating rural poverty in Kenya*. International Fund for Agricultural Development Via Paolo di Dono, 44 - 00142 Rome, Italy
- JOHNSON, S, OTIENO, ODERA, J AND S, STORCHI, S (2016) *Market Case Studies Research Project, Synthesis Report, Financial market development in Kenya 2011-14: a promise fulfilled?* University of Bath, Centre for Development Studies, Claverton Down Rd, Bath, North East Somerset BA2 7AY, United Kingdom.

- KARLAN, D. AND MORDUCH, J. (2010) *Expanding Credit Access: Using Randomized Supply Decisions to Estimate the Impacts*, Innovations for Poverty Action, Yale University, Dartmouth College, USA
- KENYA NATIONAL BUREAU OF STATISTICS (2007) *Basic Report on Well-Being in Kenya, Based on Kenya Integrated Household Budget Survey- 2005/06*, Government of Kenya
- KENYA NATIONAL BUREAU OF STATISTICS (2015) *Spatial Dimensions of Well-Being in Kenya, where are the Poor? From Counties to Wards, Based on 2009 Census*, Government of Kenya
- KPMG (2012), *Financial Deepening and M4P: Lessons from Kenya and Rwanda, Impact Paper 9: October 2012 International Development Assistance (IDAS)*, Africa, Nairobi Kenya
- LEWI, J. VILLASENOR, J. AND WEST, D. (2015) *Brookings Financial and Digital Inclusion Project Report: Measuring Progress on Financial Access and Usage*. Centre for Technology Innovations, Brookings, Washington, D.C. USA. Available from <http://www.brookings.edu/~media/Research/Files/Reports/2015/08/financial-digital-inclusion-2015-villasenor-west-lewis/fdip2015.pdf?la=en> (Accessed on 13<sup>th</sup> July 2016)
- LEWI, J. VILLASENOR, J. AND WEST, D. (2016) *Brookings Financial and Digital Inclusion Project Report: Advancing Equitable Financial Ecosystems*. Centre for Technology Innovations, Brookings, Washington, D.C. USA. Available from [https://www.brookings.edu/wp-content/uploads/2016/07/fdip\\_20160803\\_project\\_report.pdf](https://www.brookings.edu/wp-content/uploads/2016/07/fdip_20160803_project_report.pdf) (Accessed on 11<sup>th</sup> August 2016)
- LEYSHON, A. (1995) *Financial Exclusion* (MS number 160), Andrew Leyshon, School of Geography, University of Nottingham, Nottingham, NG7 2RD, UK
- MARIARA, K. J. and NDENG'E, G. K. (2014) *Measuring and Monitoring Poverty: The Case of Kenya*, A paper presented at the Poverty Analysis and Data Initiative (PADI) Workshop on Measuring and Monitoring Poverty. Mombasa, Kenya May 7th-8th 2004 Available from <http://www.eldis.org/vfile/upload/1/document/0708/DOC14829.pdf> (Accessed on 15th May 2016)
- MINISTRY OF PLANNING AND NATIONAL DEVELOPMENT (2001) *Poverty Reduction Strategy Paper*, Government of Kenya.

- Mnestudiescom. (2016). *Mnestudiescom*. Retrieved 21 July, 2016, from <http://www.mnestudies.com/monitoring/qualities-and-characteristics-indicators>
- RASCHKA, S. (2014) *Implementing a Principal Component Analysis (PCA) – in Python, step by step*. Available from: [http://sebastianraschka.com/Articles/2014\\_pca\\_step\\_by\\_step.html](http://sebastianraschka.com/Articles/2014_pca_step_by_step.html) (Accessed on 3<sup>rd</sup> September 2016)
- SARMA, M. (2008) *Financial Inclusion and Development: A Cross Country Analysis*, Indian Council for Research on International Economic Relations, Core 6A, India Habitat Centre, Lodhi Road, New Delhi 110003, India.
- SINCLAIR, S. (2001) *Financial Exclusion: An Introductory Survey*, Centre for Research into Socially Inclusive Services, Edinburgh, Scotland.
- SPRINGFIELD CENTRE (2015) *The Operational Guide for The Making Markets Work for The Poor (M4P) Approach*, 2nd edition funded by SDC & DFID
- SUMNER, A. (2013) *Working Paper 378: Who are the poor? New regional estimates of the composition of education and health 'poverty' by spatial and social inequalities*. Overseas Development Institute (ODI) 203 Blackfriars Road, London SE1 8NJ Available from: <https://www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion-files/8336.pdf> (Accessed on 15<sup>th</sup> May 2016)
- THE BANKING ASSOCIATION SOUTH AFRICA (BASA). (2016) Available from: <http://www.banking.org.za/what-we-do/overview/working-definition-of-financial-inclusion> (Accessed on 13<sup>th</sup> May 2016)
- UNITED NATIONS (2016) *The Sustainable Development Agenda*, Retrieved from <http://www.un.org/sustainabledevelopment/development-agenda/> (Accesses on 11<sup>th</sup> August 2016)
- UNITED NATIONS COMMISSION OF INTERNATIONAL TRADE LAW (2010) *Financial inclusion and poverty reduction: the role of financial inclusion in achieving the Millennium Development Goals*, Vienna, Austria. Available from <https://www.uncitral.org/pdf/english/colloquia/microfinance/KASHYAP.pdf> (Accessed on 15<sup>th</sup> May 2016)
- UNITED NATIONS DEVELOPMENT PROGRAMME (2002) *Handbook on Monitoring and Evaluating for Results*. United Nations Development Programme, UNDP, Evaluation Office, New York, Available from

<http://www.undp.org/evaluation/documents/HandBook/ME-HandBook.pdf> (Accessed on 21st July 2016)

UNITED NATIONS DEVELOPMENT PROGRAMME (2006) *Poverty in Focus*, International Poverty Centre, SBS – Ed. BNDES, 10º andar 70076-900 Brasilia DF Brazil. Available from <http://www.ipc-undp.org/pub/IPCPovertyInFocus9.pdf> (Accessed on 15th May 2016)

UNITED NATIONS DEVELOPMENT PROGRAMME (2006) *What is poverty? Concepts and measures*. United Nations Development Programme, International Poverty Centre. SBS – Ed. BNDES, 10º andar 70076-900 Brasilia DF: Brazil

UNITED NATIONS DEVELOPMENT PROGRAMME (2010) *Rethinking Poverty. Report on the World Social Situation 2010*. United Nations Development Programme, Department of Economic and Social Affairs, United Nations, New York, 2009

UNIVERSITY OF SHEFFIELD (2016) *Logistic regression*, Maths and Statistics Help Centre, Sheffield, UK. Available from [http://www.sheffield.ac.uk/polopoly\\_fs/1.233565!/file/logistic\\_regression\\_using\\_SPSS\\_level1\\_MASH.pdf](http://www.sheffield.ac.uk/polopoly_fs/1.233565!/file/logistic_regression_using_SPSS_level1_MASH.pdf), (Accessed on 5<sup>th</sup> September 2016)

WEBSTER EDUCATION (2016) *Correlation, Coefficient*, Retrieved on 11th October, 2016 from [www2.webster.edu/~woolfm/correlation/correlation.html](http://www2.webster.edu/~woolfm/correlation/correlation.html)

WORLD BANK (1996) *Report No. 13152-KE Assessing Poverty in Kenya*. Population and Human Resources Division, Eastern Africa Department, Africa Region. Washington, D.C.: World Bank. Available from: [http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2010/10/08/000333038\\_20101008041400/Rendered/PDF/570330BRI0Find10Box353751B01PUBLIC1.pdf](http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2010/10/08/000333038_20101008041400/Rendered/PDF/570330BRI0Find10Box353751B01PUBLIC1.pdf) (Accessed on 15th May 2016)

WORLD BANK (2009) *Report No. 44190-KE -Kenya Poverty and Inequality Assessment Executive Summary and Synthesis Report*. Poverty Reduction and Economic Management Unit Africa Region. World Bank. Available from: <http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2009/07/21/0003330>

[37\\_20090721003150/Rendered/PDF/441900ESW0P0901IC0Dislosed071171091.pdf](http://www.worldbank.org/content/dam/Worldbank/document/Africa/Kenya/kenya-economic-update-june-2013.pdf)

(Accessed on 15th May 2016)

WORLD BANK (2013) *Kenya Economic update, edition 8. Time to shift gears: Accelerating growth and poverty reduction in Kenya*. Poverty Reduction and Economic Management Unit Africa Region. World Bank, Nairobi Kenya Available from: <http://www.worldbank.org/content/dam/Worldbank/document/Africa/Kenya/kenya-economic-update-june-2013.pdf> (Accessed on 15th May 2016)

WORLD BANK (2013) *The State of the Poor: Where are the Poor and where are they Poorest*. Poverty Reduction and Equity, World Bank, Nairobi Kenya Available from: [http://www.worldbank.org/content/dam/Worldbank/document/State\\_of\\_the\\_poor\\_paper\\_April17.pdf](http://www.worldbank.org/content/dam/Worldbank/document/State_of_the_poor_paper_April17.pdf) (Accessed on 15th May 2016)

WORLD BANK (2015) *Financial Inclusion, Growth and Poverty Growth and Poverty Reduction*, Finance and Markets Practice, World Bank, Brazzaville, March 23, 2015, ECCAS Regional Conference.

WORLDBANKORG. (2016). *worldbankorg*. Retrieved 21 July, 2016, from

<http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTPOVERTY/EXTPA ME/0,,contentMDK:20191410~menuPK:435489~pagePK:148956~piPK:216618~theSitePK:384263,00.html>

## ANNEXES

### Annex 1: Indicators of financial inclusion against the wealth quintiles

	Poorest	Second Poorest	Middle	Second Wealthiest	Wealthiest
<b>A. ACCESS</b>					
<b>1. Distance from a financial service provider</b>					
Under 10 minutes	16%	26%	36%	55%	72%
About 10 to 1 hour	67%	67%	60%	42%	27%
Over 1 hour	17%	7%	4%	3%	0%
<b>2. Uses at least one formal or informal financial instrument</b>					
At least one financial instrument	56%	76%	84%	90%	94%
Excluded	44%	24%	16%	10%	6%
<b>3. Awareness of financial terms</b>					
Savings account	52%	76%	85%	91%	97%
Interest	40%	65%	71%	83%	93%
Shares	39%	66%	73%	83%	92%
Collateral	11%	15%	19%	27%	48%
Guarantor	28%	46%	58%	72%	82%
Investment	27%	50%	57%	75%	91%
Inflation	15%	21%	28%	37%	59%
Pension	37%	59%	66%	76%	90%
Mortgage	7%	12%	22%	36%	68%
<b>B. QUALITY</b>					
<b>If have a safe place to save money</b>					
Those with NO safe place to keep KShs 6000	15%	10%	9%	5%	2%
<b>C. USAGE</b>					
<b>Use of different financial services – banks, mobile money, informal groups, SACCOs, insurance, MFIs.</b>					
Bank Usage	9%	22%	32%	53%	77%
Insurance Companies (IRA Regulated) Usage	1%	2%	3%	5%	20%
Mobile Money Usage	38%	64%	76%	87%	92%
MFI Usage	1%	3%	3%	5%	7%
SACCO Usage	3%	7%	12%	16%	27%
Informal Group Usage	26%	41%	46%	47%	47%

## Annex 2: Summary of the financial indicator variables

Descriptive Statistics				
	Mean	Std. Deviation <sup>a</sup>	Analysis N <sup>a</sup>	Missing N
<b>Financial inclusion access indicators</b>				
Distance from the closest financial service point	1.5506	.45561	22331041	3597479
Include or excluded	1.2017	.40126	22331041	0
Awareness of savings accounts	1.20	.402	22331041	0
Awareness of interest	1.30	.456	22331041	0
Awareness of shraes	1.30	.458	22331041	0
Awareness of collateral	1.76	.425	22331041	0
Awareness of Guarantor	1.44	.497	22331041	0
Awareness of investment	1.40	.490	22331041	0
Awareness of inflation	1.69	.463	22331041	0
Awareness of pension	1.36	.480	22331041	0
Awareness of mortgage	1.72	.451	22331041	0
<b>Financial inclusion quality indicators</b>				
If have a safe place to keep money	.90	.299	22331041	0
If experienced unexpected charges from the bank	1.93	.101	22331041	18594839
If lost money in the bank	1.98	.057	22331041	18594839
If registered a complaint with the bank	1.98	.061	22331041	18594839
If lost money on mobile money	1.87	.292	22331041	6009342
<b>Financial inclusion usage indicators</b>				
Bank usage	2.17	.935	22331041	0
Insurance usage	2.52	.831	22331041	0
Mobile Money Usage	1.60	.897	22331041	0
MFI Usage	2.89	.404	22331041	0
SACCO Usage	2.71	.672	22331041	0
Informal Group Usage	2.10	.939	22331041	0
Savings Usage	1.62	.870	22331041	0
Credit Usage	2.06	.848	22331041	0
Investment Usage	2.78	.607	22331041	0
Pension Usage	2.97	.254	22331041	0
Frequency of using mobile money	2.5443	.75049	22331041	6009342

a. For each variable, missing values are replaced with the variable mean.

### Annex 3: Financial inclusion indicator correlation matrix

Correlation matrix																											
	Distance from the closest financial service point	Include or excluded	Awareness of savings accounts	Awareness of interest	Awareness of shraes	Awareness of collateral	Awareness of Guarantor	Awareness of investment	Awareness of inflation	Awareness of pension	Awareness of mortgage	If have a safe place to keep money	If experienced unexpected charges from the bank	If lost money in the bank	If registered a complaint with the bank	If lost money on mobile money	Bank usage	Insurance usage	Mobile Money Usage	MFI Usage	SACCO Usage	Informal Group Usage	Savings Usage	Credit Usage	Investment Usage	Pension Usage	Freq of MM recorded
<b>ACCESS INDICATORS</b>																											
Distance from the closest financial service point	1.000	.111	.107	.110	.112	.130	.121	.150	.118	.126	.204	-.065	.000	-.020	.000	.046	.196	.144	.150	.049	.060	.058	.142	.061	.049	.045	.135
Include or excluded	.111	1.000	.332	.285	.314	.145	.304	.277	.180	.307	.210	-.194	0.000	0.000	0.000	.015	.413	.280	.739	.126	.204	.415	.642	.374	.173	.065	.059
Awareness of savings accounts	.107	.332	1.000	.560	.545	.208	.437	.482	.256	.435	.255	-.169	.001	.005	.001	.042	.323	.223	.372	.094	.174	.180	.364	.202	.130	.064	.134
Awareness of interest	.110	.285	.560	1.000	.607	.259	.473	.552	.315	.437	.331	-.168	.010	.006	.007	.048	.335	.254	.336	.108	.189	.146	.321	.208	.155	.072	.157
Awareness of shraes	.112	.314	.545	.607	1.000	.243	.459	.544	.310	.429	.340	-.163	.009	-.001	-.004	.059	.338	.266	.354	.113	.199	.166	.342	.217	.165	.076	.161
Awareness of collateral	.130	.145	.208	.259	.243	1.000	.325	.329	.492	.295	.443	-.091	.037	-.006	.021	.084	.252	.222	.176	.102	.132	.077	.176	.162	.159	.109	.198
Awareness of Guarantor	.121	.304	.437	.473	.459	.325	1.000	.488	.396	.474	.401	-.169	.024	.002	-.002	.055	.401	.322	.359	.148	.247	.172	.344	.258	.201	.100	.175
Awareness of investment	.150	.277	.482	.552	.544	.329	.488	1.000	.415	.484	.448	-.172	.019	.012	.002	.069	.385	.286	.336	.099	.190	.108	.309	.200	.163	.090	.209
Awareness of inflation	.118	.180	.256	.315	.310	.492	.396	.415	1.000	.361	.531	-.113	.012	-.016	.024	.061	.318	.280	.227	.090	.192	.046	.205	.189	.168	.150	.202
Awareness of pension	.126	.307	.435	.437	.429	.295	.474	.484	.361	1.000	.377	-.150	.006	-.006	.016	.071	.381	.280	.360	.104	.196	.165	.345	.225	.161	.087	.165
Awareness of mortgage	.204	.210	.255	.331	.340	.443	.401	.448	.531	.377	1.000	-.110	.036	.017	.033	.060	.406	.358	.271	.097	.246	.067	.260	.189	.221	.153	.252
<b>QUALITY INDICATORS</b>																											
If have a safe place to keep money	-.065	-.194	-.169	-.168	-.163	-.091	-.169	-.172	-.113	-.150	-.110	1.000	-.009	.005	-.005	-.011	-.168	-.111	-.204	-.065	-.075	-.114	-.188	-.112	-.073	-.038	-.064
If experienced unexpected charges from the bank	.000	0.000	.001	.010	.009	.037	.024	.019	.012	.006	.036	-.009	1.000	.280	.211	.044	0.000	.012	.000	.007	.009	.029	.001	.005	.046	.011	.009
If lost money in the bank	-.020	0.000	.005	.006	-.001	-.006	.002	.012	-.016	-.006	.017	.005	.280	1.000	.244	.057	0.000	-.013	.002	.017	-.012	.008	.001	.002	.016	-.012	-.009
If registered a complaint with the bank	.000	0.000	.001	.007	-.004	.021	-.002	.002	.024	.016	.033	-.005	.211	.244	1.000	.036	0.000	-.014	.003	.004	.002	.017	-.001	.010	.010	-.001	.027
If lost money on mobile money	.046	.015	.042	.048	.059	.084	.055	.069	.061	.071	.060	-.011	.044	.057	.036	1.000	.092	.087	.020	.017	.064	.048	.062	.046	.042	.056	.112
<b>USAGE INDICATORS</b>																											
Bank usage	.196	.413	.323	.335	.338	.252	.401	.385	.318	.381	.406	-.168	0.000	0.000	0.000	.092	1.000	.470	.448	.184	.314	.190	.558	.319	.250	.145	.333
Insurance usage	.144	.280	.223	.254	.266	.222	.322	.286	.280	.280	.358	-.111	.012	-.013	-.014	.087	.470	1.000	.302	.121	.388	.153	.324	.251	.277	.237	.205
Mobile Money Usage	.150	.739	.372	.336	.354	.176	.359	.336	.227	.360	.271	-.204	.000	.002	.003	.020	.448	.302	1.000	.139	.205	.280	.516	.270	.163	.073	.067
MFI Usage	.049	.126	.094	.108	.113	.102	.148	.099	.090	.104	.097	-.065	.007	.017	.004	.017	.184	.121	.139	1.000	.096	.166	.172	.208	.135	.013	.125
SACCO Usage	.060	.204	.174	.189	.199	.132	.247	.190	.192	.196	.246	-.075	.009	-.012	.002	.064	.314	.388	.205	.096	1.000	.115	.291	.246	.327	.198	.154
Informal Group Usage	.058	.415	.180	.146	.166	.077	.172	.108	.046	.165	.067	-.114	.029	.008	.017	.048	.190	.153	.280	.166	.115	1.000	.585	.312	.233	.030	.063
Savings Usage	.142	.642	.364	.321	.342	.176	.344	.309	.205	.345	.260	-.188	.001	.001	-.001	.062	.558	.324	.516	.172	.291	.585	1.000	.348	.209	.086	.178
Credit Usage	.061	.374	.202	.208	.217	.162	.258	.200	.189	.225	.189	-.112	.005	.002	.010	.046	.319	.251	.270	.208	.246	.312	.348	1.000	.238	.092	.137
Investment Usage	.049	.173	.130	.155	.165	.159	.201	.163	.168	.161	.221	-.073	.046	.016	.010	.042	.250	.277	.163	.135	.327	.233	.209	.238	1.000	.159	.120
Pension Usage	.045	.065	.064	.072	.076	.109	.100	.090	.150	.087	.153	-.038	.011	-.012	-.001	.056	.145	.237	.073	.013	.198	.030	.086	.092	.159	1.000	0.075
Frequency of using mobile mone	.135	.059	.134	.157	.161	.198	.175	.209	.202	.165	.252	-.064	.009	-.009	.027	.112	.333	.205	.067	.125	.154	.063	.178	.137	.120	0.075	1.000
	perfectly and positively* correlated with itself!																										
	high correlation																										