[Determinants of Financial Inclusion in Sub-Saharan Africa]:

[Odhiambo Trevor Ooko; 101187]

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DECLARATION

I declare that this work has not been previously submitted and approved for the award of a degree by this or any other University. To the best of my knowledge and belief, the Research Project contains no material previously published or written by another person except where due reference is made in the Research Project itself.

Odhiambo Trevor Ooko ..... [*Name of Candidate*]

..... [*Signature*]

10/02/2021 ..... [*Date*]

This Research Project has been submitted for examination with my approval as the Supervisor.

..... Mercy Kano ..... [*Name of Supervisor*]

..... M.Kano ..... [*Signature*]

..... 10/02/2021 ..... [*Date*]

Strathmore Institute of Mathematical Sciences

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CHAPTER ONE: INTRODUCTION

Background Study

Financial exclusion is the lack of access by clients to appropriate low cost, fair and safe financial products and services. Leyshon and Thrift explained it as the processes that are in place to prevent individuals or a section of individuals from gaining access to the formal financial system. Individuals being excluded from banking services generate negative socio-economic consequences for economies (Levine, 1993). Defining financial exclusion prompts the need to elaborate on financial inclusion as they go hand in hand. Financial inclusion is the ease of access, availability and consumption of the services offered by the financial system of an economy. This brings about the importance of financial inclusion in a country as it improves sustainability and an economy's stability. The definition of financial inclusion gives us a scope which includes accessibility, availability and consumption of the services offered by the financial system particularly the banking industry.

Providing access to financial services to members of the community has had increased importance over the years around the world. Financial inclusion can improve national output especially if it involves a larger portion of the population. The benefits of providing access to financial services include improving the livelihood of members of the community, enabling enterprises to be started and built up, enhance development and economic growth and provide jobs to people in the financial sector. Financial services are essential in allocating resources more evenly to disadvantaged households and they are provided by financial institutions. Financial Institutions together with the government are important in enabling an environment for growth and play a big role in enhancing the process of financial inclusion and ensuring sustainable sources of livelihood and raising the standards of living of the poor people. The United Nations (UN) is one of the international bodies at the forefront of this by implementing the 2005 International Year of Microcredit with the objective of building inclusive financial systems. Studies done in the past show that poor people significantly depend on financial services to go about their day-to-day activities and that enhancing their access to financial services can improve the livelihood of the people and help them in other ways.

According to a study done by the United Nations, an approximated 3 billion people around the world do not have access to financial services such as credit, insurance, remittance, savings, and payment services (UN, 2007). Further studies show that 80 percent of households in Africa are financially excluded (Chaia, Gonzalez, 2009). The reason for such a high percentage being excluded could be attributed to several things such as physical infrastructure, documents required by financial institutions which could be a burden to some and bureaucratic procedures in accessing finance. These are mostly due to rules and regulations that govern the operations of the financial markets which inevitably leads to the marginalized sector being excluded. When it comes to financial exclusion, you can either be voluntarily or involuntarily excluded. Instances of involuntary exclusion include affordability or being unable to meet the criteria to be considered eligible while voluntary exclusion may include lack of interest in financial services or due to cultural reasons.

Closer home in Kenya, the Economy has improved by 5.5% year-on-year in the fourth quarter of 2019, following a revised study done showing 5.2% growth in the previous year. The financial system in Kenya has rapidly grown in the last ten years and is seen to be valuable in contributing to the economic growth in Kenya. A study revealed that a higher portion of people were included formally in financial services offered by Microfinance institutions, banks, Savings and Credit Cooperative Organizations, credit services through mobile applications such as Branch and Tala and money transfer services such as M-Pesa. Within eight months of its inception, M-Pesa registered over 1.1 million users. Financial instruments have become increasingly complex and individuals are presented with new and more sophisticated financial products. Access to credit is easier than ever before and opportunities to borrow are many as we can see from new enterprises such as Tala, Timiza, Berry. M-Shwari and KCB M-Pesa among others which are accompanied by technological advancements as you can simply take a loan by using your phone. Most financial systems in Africa have however been found to be flawed in providing adequate access to services to individuals specifically by banks. This indicates that the amount of exclusion is still high and is mostly associated with the people living below the poverty line. A study done by the World Bank shows that the level of financial inclusion is improving although the amount of those excluded is still very high.

Problem Statement

Financial inclusion prevents individuals from falling into extreme poverty by cushioning the negative effects of unexpected expenses (Klapper et al., 2016). Despite growing levels of financial inclusion in Africa due to the spread of mobile money according to studies done by the World Bank, there are some sectors of the population that are excluded from accessing financial services and some are over included. A classic issue to be investigated therefore is the determinants that affect financial exclusion. Based on many studies and surveys conducted by the World Bank, it has been found that the lack of financial knowledge and awareness prevents individuals from utilizing products and services that will help them go about their day-to-day activities. Developing countries such as Kenya have much less financially literate population as compared to developed countries. A country cannot experience steady development if a section of its citizens is excluded from the financial system.

Research Question

(i) What is the relationship between financial inclusion and demographic variables in Sub-Saharan countries?

Research Objectives

The objective of this paper is to determine how demographic variables such as gender, level of education, and age affect financial inclusion.

Hypothesis of the study

- This study tests the null hypothesis that there is a significant relationship between the demographic variables and financial inclusion.

CHAPTER TWO: LITERATURE REVIEW

Theoretical Framework

Financial Inclusion is the process by which appropriate financial products and services needed by the people in society in general are made accessible at an affordable cost in a fair and transparent manner by regulated financial institutional players (Chakrabarty,2010). Financial inclusion is also interpreted as the creation of financial sector policies that lead to the creation of programmes to make financial services accessible to all (Bernad, Fuentelsaz and Gomez,2008). Hayton, Latimer and Percy (2007) defined it as access for individuals to appropriate financial products and services. It further includes provision of affordable financial services such as savings, loans, insurance services and access to payments and remittance services by the regulated financial institutions. There is a need to take an in-depth analysis into financial exclusion to fill the current research gap.

Financial exclusion refers to the individuals who do not make use of or are not part of a country's banking sector (Marron, 2013). It is also important to note that some governments and financial sectors around the world have strict policies that restrict the entry and consumption of banking services by just anyone as they require guarantees such as collateral from clients for certain products and services.

Why does financial inclusion matter? Firstly, it enables the individuals in society living below the poverty line to improve their livelihoods and sustain themselves. The essential aspect of this importance is that it empowers people and communities by enabling individuals to have the ability to manage their money more effectively and empower them with abilities, knowledge and skills to better their lives financially. This will inevitably enhance economic development by promoting investments and creating job opportunities. Also, being included in the financial system leads to individual benefits including the ability to make good financial decisions in regard to savings, investment and consumption. Financial inclusion came about as the solution to exclusion of people from the financial system using technology for online banking or agents.

The theory of asymmetric information, also known as information failure, is important in studying financial inclusion. Asymmetric information happens when one party has more knowledge than the other party for instance when a seller of a good knows the true quality and value of the commodity than the buyer. It was mainly developed by George Akerlof in his paper, "Market for Lemons: Quality Uncertainty and the Market Mechanism." This theory poses a risk when it comes to financial inclusion. Two problems often arise in this issue which are the moral hazard and adverse selection. Adverse selection occurs where an insurance company faces the risk of loss due to the client failing to give complete information at the time of the policy's sale while moral hazard is the risk that the insured has not entered into the insurance contract in good faith and has provided misleading information.

In the financial sector, borrowers have the upper hand over lenders since they have more information about their streams of income and expenses. Many a time, good quality borrowers pay higher interest rates than poor quality borrowers and they are eventually forced out of the market. Therefore, due to the informational asymmetry, the imbalance between the lender and the borrower lowers the efficiency of banking services to clients which in turn reduces profitability and the stability of banks. Mistrust between financial institutions is built from failure to comply with the disclosure agreement by clients. The theory thus reveals that complete financial inclusion is less feasible presenting a gap that needs to be addressed by more studies. A certain section of the population brings about challenges in financial inclusion efforts as they provide false details of their income level or employment status leading to inaccurate results in various studies.

Over the years, the Global Findex Database has come up with updated indicators of World Development that assist in determining a more accurate level of financial inclusion and measure the effect of the determinants reliably. Financial market anomalies such as asymmetric information can be the tool that leads to widespread poverty traps and income inequality between individuals in an economy. In various studies, financial inclusion is seen to reduce these market anomalies most notably by reducing the transaction costs thus the importance of carrying out studies in this area.

Previous literature indicates that although there is a clear definition of financial inclusion, there is no standardly used method by which it can be measured. There have been a number of studies using different measures of financial access. Honohan (2008) developed an indicator which includes a section of the adult population with access to formal financial intermediaries in a given country using household surveys. Another study developed an indicator of variables in relation to varying dimensions such as the demographic penetration, the amount of consumption and the cost of consumption. Banking penetration, availability of banking services and consumption dimension are the dimensions of a financial system that incorporate financial inclusion (Sarma, 2008). Different dimensions of financial access include easy physical access and indicators used to measure this include demographic bank and ATM penetration, deposit and loan accounts of individuals, geographic branches. The geographical positions of bank branches are important as it eases access to financial facilities by individuals across an economy. An individual who has to travel a long distance to the nearest bank will decide not to use the service often and altogether may pull out of the financial institution. Physical access is essential as proved by Lewis (1955) as it indicates that the amount of savings depends partially on the outreach of the financial services.

Another dimension to be considered in this study includes gender. Research shows that there exists a relationship between demographic variables and the usage of financial services (Ellis et al, 2010). The variables include age, gender, level of education and marital status. A study by Zakaria and Sabri (2013) revealed that financial access varies across different demographic variables. It showed that younger people particularly women, were found to possess low financial capability especially those with a low level of education and low-income level. In regard to age, it was found that there was a positive statistically significant relationship of age with credit from formal financial institutions such as Savings and Credit Cooperative Societies (SACCOs), Microfinance institutions and Banks. Research indicates that younger individuals (18-24 years of age) were less able to resist activities that could result in future credit card debt and less willing to realize that they may be heading down a dangerous path especially if they have no source of income.

It is essential to note that neither gender nor age-related issues establish causation in this case. In regard to the level of education, I intend to correlate the educational attainment with financial inclusion. Studies show that around 1.8 billion adults remain without a bank account and this has been linked slightly to low educational attainment. They however, establish patterns and trends that prompt further analysis. Policy reforms developed for the macro-economic environment are essential for the development of the financial sector in Kenya (World Bank, 2015). However, in this study, we study the variables at a country level which involves coming up with recommendations in regard to financial access across demographic variables. The issue of financial access is greatly combined with the challenge of poverty alleviation as described by the Vision 2030 of Kenya. Under the Vision 2030 Medium Term Plan, the main objective for the financial services sector is to mobilise savings to 25 to 28 percent to sustain an increase in the ratio of investment to Gross Domestic Product of around 30 percent. This objective envisions a good culture of saving and investment as it provides an avenue for building wealth over a long period of time and encourages individuals to educate themselves on certain concepts such as diversification when investing. The rate of savings is increasing in Kenya both formally through financial institutions and informally while the borrowing rate is also on the rise with more individuals taking up more credit. Savings are mostly used for investment purposes while credit is mainly for consumption by individuals in the economy (World Bank, 2015).

Several models have been suggested to represent the barriers of financial inclusion Understanding the barriers to access enables the chance to create a better environment for financial institutions to spread financial access to a wider range of clients in an economy. The variables previously used by researchers in different studies include both demand-side and supply-side indicators. Demand-side data entails collection of information regarding financial inclusion from the consumers (Diniz et al., 2012). Collection of data on demographic characteristics of consumers was done through individual level surveys which was important to segregate the population with the greatest level of financial exclusion such as the poor and the vulnerable individuals. The data however was limited in that it was of poor quality and low quantity in terms of the number of countries that the survey was carried out (Chaia, Gonzalez, 2009).

Demand side barriers include lack of trust, lack of awareness, low levels of financial literacy and low level of income. Lack of trust mainly stems from bank officials being unfriendly to rural people who then lose trust in the financial institutions (Diniz et al., 2012). Also, the cost of acquiring financial products such as credit cards and debit cards is high and people may be reluctant to open accounts because of the requirement of maintaining a minimum balance in the account. Lack of awareness among people concerning financial products and services is widespread and this is related to financial literacy which encourages people to be aware of what they should want in terms of financial services. On the other hand, some of the supply side indicators include the number of bank branches, the number of deposit accounts and the number of loan accounts. They are essential when measured at the industry-level to policy making and long-term strategies.

The barriers in the supply side include diseconomies of scale, poor regulation and unequal distribution of financial services. Poor regulation refers to a low degree of consumer protection when it comes to conduct of business which discourages individuals from participating in the financial markets (Behrman et al., 2012). It also encourages risky behaviour by some financial services providers. Dealing with these barriers to access will benefit countries in terms of economic development as it extends financial access to individuals. However, even after tackling these problems, it is still difficult to obtain a fully functional financial inclusion system.

Empirical Framework

Different researchers have used various sets of financial inclusion indicators according to their research objectives. The manner in which financial inclusion is defined is essential for researchers to develop a way to measure it. Studies show that there is limited access to financial services in Sub-Saharan Africa and also other parts of the developing countries in the world. It is important to note that without conducting national surveys, it is difficult to measure the level of financial inclusion. Earlier studies by researchers used an approach which only included measuring the number of households having a bank account. This was challenging in giving accurate results since it did not include other aspects such as usage and availability.

One of the key studies done in this area is by Pascal Dupas and Jonathan Robinson which seeks to understand why individuals are constrained and experience challenges in their ability to save in relation to financial inclusion. The research revealed that there is little evidence that savings accounts crowd out investments (Dupas and Jonathan, 2009). It further established that although many individuals have access to financial services in developed countries, many households tend to depend on informal arrangements. The paper further proposes that the present measures in place to implement better access to financial services, are inadequate. The researchers conducted a randomized trial in two phases and it was discovered that although credit consumption and savings account usage was low, enhancing access to savings accounts helped the heads of households rely less on family members. The overall proportion of individuals with savings accounts was 69 percent and this take-up greatly increased bank usage on average. More effort should be put into enhancing financial access as a whole especially in the rural areas in order to encourage saving and investment.

Mandira and Pais (2008) carried out a study across 49 countries at a country-level using data for 2004 to determine the factors that are significantly associated with financial inclusion. The socio-economic factors considered were income level, inequality, literacy level urbanisation. The paper concluded that income is an important variable in determining the level of financial inclusion especially in countries such as Greece, Belgium, Spain, Norway and France while having a low Gross Domestic Product, low urbanization, higher income inequality and low levels of financial literacy greatly contribute to financial exclusion. To elaborate on this, the marginal effect of financial literacy on access to finance is higher at lower levels of financial depth thus indicating that, at all scales of financial depth, improving financial literacy is useful for improving financial inclusion.

Further, a composite index of financial inclusion to measure variations in access to finance between different countries was developed by Kuri and Laha to identify factors that cause the process of financial inclusion to be slowed down. The major factors in the model include; the economic status of the household, the level of education, non-farm employment, rural development and social security. From their findings, there is a need for more financial inclusion by governments around the world as proven by further studies in this area. A study done in Western Africa particularly in Ghana by Mamudu Akudugu set the research objective of analysing the determinants of financial inclusion in the Western part of Africa specifically in Ghana. The data that was used comprised 1000 individuals of different classes in society

such as employment status, gender, wealth classes and geographical location. The determinants of financial inclusion are then estimated at an individual level using a logistic regression model with the findings showing that the factors include wealth level, age, gender, literacy level, social network and lack of documentation. A relevant framework for financial inclusion was then suggested in order to improve the effects of positive variables and reduce the effects of negative determinants of financial inclusion. For this particular study, the analysis is carried out at a country-level as it focuses on many countries in Africa.

In regard to the Eastern side of Africa, a study was conducted by Olanrewaju Fatoki covering Kenya, Tanzania, Uganda, Burundi and Rwanda. The study had a similar objective of determining the factors affecting financial inclusion in East Africa. An additional factor, interest rates, is introduced into this study to get a more comprehensive level of financial inclusion. The research design that was adopted was panel data analysis with data from the World Bank Database analysed using stata. The study revealed that the unemployment, income level and rural population negatively affected financial inclusion. Literature on financial inclusion indices indicate a general observation that rural areas are associated with few bank branches which are far from each other causing a lower level of financial inclusion. A good example is Madagascar where there is only one bank branch which covers a population of about 1.5 million individuals (CGAR, 2009). Interest rates were found to be positively related with financial inclusion and the recommendation was that the level of financial literacy should be improved to promote financial inclusion.

Another study done in India revealed that there is a significant relationship between socio-economic variables and financial inclusion. An index was developed for financial inclusion using four dimensions measured by the Euclidean distance formula then a regression analysis carried out to investigate the effects of the various variables. The index constructed takes the value between zero and one. Zero represents 'no financial inclusion', 0 to 0.3 represents 'low financial inclusion', 0.3 to 0.6 represents 'medium financial inclusion' and 0.6 to 1.0 represents 'high financial inclusion'. The variables that were considered include employment status, income level, literacy levels and the rural population. From the regression analysis, the value of the R-squared explained that 77% of the variables have a significant relationship with financial inclusion. The hypothesis of the existence of a significant relationship between financial inclusion and socioeconomic variables was therefore accepted.

In a study done by Sarma and Pais (2011), financial exclusion from the financial system in developed economies occurs to certain groups of individuals such as minority and marginalized groups, the elderly and the low-income groups. Further, literature suggests that although an individual may have a bank account, they may fail to use it thus highlighting the importance of the three dimensions of financial access. In many countries, people living in urban areas own a bank account but only a certain proportion of individuals use it adequately. In addition to that, individuals living in rural areas are more likely to be financially excluded than those who live in urban areas. This was established after a regression was done on socio-economic variables with financial inclusion as the dependent variable. A decline in inequalities is associated with relatively higher levels of financial inclusion as shown by Buckland et al,Kempson and Whyley who found that lower levels of income inequality are associated with a rise in financial inclusion.

Financial inclusion has been a major concern around the world over the years. Evidence shows that exclusion from financial services negatively affects how individuals make decisions which ultimately impacts their livelihoods and at a macro level inhibit economic growth. A study conducted in Kenya by Ellis, Lemma and Rud (2010) found that many individuals save and borrow for household investment objectives for future consumption. Without access to bank accounts, it becomes difficult to save money or engage in investment opportunities to better an individual's life. Additional reasons that were given for saving which included setting up business enterprises and investing in education for themselves and their children. The reasons for not saving or borrowing included lack of funds and high interest charges on loans. The study also found that both semi-formal and informal instruments were used and asserts that there is a gap in the supply of the services by formal lenders.

Conceptual Framework: Demographic variables of Interest

In previous studies conducted, demographic variables are important as they allow stakeholders to understand and determine the size of a market segment. Trends in demographics are essential since it changes over time due to political, economic and cultural reasons. They include age, gender, level of education, income and the employment status. The proportion of the population which is financially excluded either willingly or unwillingly are also incorporated.

In most economies, the level of financial exclusion varies among the different age groups as the aged population are more likely to be excluded than the younger population. According to data obtained from the Global Financial Inclusion (Global Findex), 44 percent of youth (ages 18–25) have an account at a formal financial institution, compared to 55 percent of older adults (ages 26–64). Just 18 percent of youth report having saved formally in the past year, and 6 percent having borrowed formally.

Regarding gender, according to the latest data from the Global Findex, women make up 1 billion of the 2 billion unbanked individuals around the world. Demirguc-Kunt et al. (2013) found that there is a gender gap considerably large in account ownership, formal credit and formal saving. In certain nations, women are less likely to use formal financial services. Further studies show that women often have to pay higher interest rates than men and they are also more likely to be denied credit from banks due to low credit worthiness or lack of collateral

The level of education is also directly related to the level of financial inclusion. The higher the level of education that one has attained greatly increases their chances of being formally financially included. A study done by Johnson and Nino-Zarauza (2007) shows that those who attained secondary education were highly likely to use formal financial services compared to those who have no education. Collonny (2014) found that the educational level in Australia was uniformly spread among the individuals who are financially excluded. Previous studies indicate that people with higher levels of income are less likely to be financially excluded than those with lower income levels. Johnson and Nino-Zarauza revealed that the income of a household is the most important variable in determining financial exclusion. Despite the employment status having a close correlation with the income of an individual, it is still an important factor in determining the level of financial exclusion.

The account ownership variable focuses not only on the number of accounts owned but also the frequency of use and the purpose. Other groups of indicators used by the World Bank are the use of savings accounts and use of credit accounts. According to the Global Findex database, 69 percent of adults have an account as at 2017. Accounts are important in an individual's life as it enables them to store their money in a secure place and build wealth for future purposes through savings accounts that offer a small profit on deposit.

Another importance of this variable is that it enables holders to make regular payments of bills and withdraw money directly. Data from the Global Findex indicates that mobile money accounts in Kenya are widely used at 73 percent of adults. The World Bank uses the statistics of population of an economy to weight the data by demographic variables such as age. Other demographic indicators related to financial inclusion include; borrowing from a financial institution, credit card ownership, debit card ownership, digital payments made or received, mobile money account and saved at a financial institution which will be discussed in depth.

Research Gap

Financial inclusion involves converting from the cash payment method to usage of accounts which is a more accountable and transparent means of payment for individuals, businesses or government entities. In the long-run, better access to the formal financial system enhances productivity and promotes economic growth. Also, financial depth contributes significantly to economic growth and development. The measure of financial development is by macro-level indicators, such as market capitalization of the stock market or the ratio of credit to gross domestic product (GDP) of an economy. Some factors that affect the level of financial inclusion and financial development include good governance, income per capita, availability of information, and the regulatory environment (Karlan et al. 2014). Measures of financial depth have also been linked with better economic growth and lower income inequality among several economies (King and Levine 1993; Beck et al. 2000; Demirguc-Kunt and Levine, 2009). A study by Burgess and Pande (2005) found that an increase in the number of bank branches in rural areas causes a consequent decrease in rural poverty in India.

Although these studies have been conducted in many countries, there are newly updated indicators by the World Bank that can be used to carry out further research on financial inclusion and its variables. Also, a research gap remains in the informal financial sector and the mobile banking sector which is steadily growing. The study focuses on giving new evidence based on these sectors in order to realise the full potential of the financial sector in the continent.

CHAPTER THREE: METHODOLOGY

Research design

The study adopts a descriptive research design as it brings together a large amount of data and identifies variables with a significant positive association with financial exclusion. The research design aims at helping policymakers make good decisions regarding their target market segment specifically the demographic variables which will help in the spread of financial awareness.

Population and sampling

From the Global Findex Database, the data collected represents more than 150,000 adults in more than 140 economies. For this study however, it focuses on 41 countries in Sub-Saharan Africa. The survey was done in the year 2017 and it also documents data for the year 2014 and 2011. The criteria used to identify and choose households is the random route procedures. The selected households are then approached for interviews where the respondents are randomly chosen. Random sampling is used on top of selecting the sample by considering probabilities that are proportional to the size of the population. Few attempts are made to reach households that are not cooperative before another method is employed. The substitution method is implemented when an interview cannot be conducted due to outright refusal or other unforeseen circumstances. Another sampling technique is where the random digit dialling is done in countries where telephone interviews are conducted. The sample size for this study is sufficient enough to draw appropriate interpretations with a good sampling technique such as the choosing of random respondents which will enhance the quality of the data.

Data collection

The research study will be conducted by utilising the Global Findex database which contains comprehensive data on how individuals spend, save, borrow and make payments. It is collected through conducting national surveys of over 150000 individuals in more than 140 countries and began in 2017. For this study, the data contains updated indicators on financial access and usage of financial services. It uses the quantitative research method as this approach enables simpler identification of the independent and the dependent variables.

For additional data, questionnaires that were issued out in the year 2016 will be used, specifically the FinAccess Survey Data. The total number of observations however was 8665 individuals aged 16 or above. The data collection period ranged from 18th August 2015 to 15th October 2015 and it is provided by the Financial Sector Deepening Kenya. The type of data that will be used is quantitative data where numerical values are attached to variables in the questionnaires.

The study used secondary data from the Global Findex database. They adopted the interview method which was conducted face to face in most economies and the procedure was completed in two to four weeks in the year 2017. The identification of sampling entities were divided into geography and population size.

Comprehensive data is obtained from the Global Findex Database 2017. The type of data collected is cross-sectional data as it comprises data from the year 2017.

Data analysis

A probit regression model will be adopted as not many studies have implemented it. The dependent variable can take two values either one is financially included or not. The independent variables will include the level of access to basic banking services for money transmission for example current accounts, level of credit, level of savings and level of debt. These will be measured by the various World Development indicators: account ownership, borrowing from a financial institution, credit card ownership, debit card ownership, digital payments made or received, mobile money account and saved at a financial institution. I intend to carry out the study at a country level to come up with recommendations to improve financial inclusion across demographic variables. Non-collinearity is an important condition for the model. If the variables are highly correlated then we will get less accurate results about their relationship with financial inclusion. The test for correlation will also be carried out for this purpose. Pearson correlation is used to test the relationship between economic growth and financial inclusion. A diagnostic check will be conducted to determine which model will be the best fit for the cross-sectional data after testing for heteroskedasticity to observe the variance in the data. The probit regression analysis equation used in the research appears as follows;

$$Yi,\{1,0\} = \beta 0 + \beta 1 Gender i,t + \beta 2 Inc2i,t + \beta 3 Emp3i,t + \beta 4 Educ4i,t + \beta 5 Age + \varepsilon i,t$$

Where Y is the dependent variable which represents financial inclusion (It can take two values; either one is financially included or not). In order to be able to explain whether one is financially excluded or not they answer the following questions: "Do you have an account at a bank or another type of formal financial institution? Have you saved at a formal financial institution in the past 12 months? Have you taken a loan at a formal financial institution in the past 12 months? Do you own a mobile money account?" Each of the answers is a dummy equal to "one" if the person answered "yes" and "0" otherwise.

Y= {1,0}, where 1 represents one who is financially included and 0 which represents one who is not

E is the error term or the unobserved variable

A dummy variable may need to be included to control for other factors that may be missing in the regression.

A new important indicator added to the model is the number of individuals who have made or received digital payment which is essential in evaluating the use of mobile money banking and is categorised further into: those who have paid school fees using a mobile phone and those who have paid utility bills using a mobile phone. These indicators have been updated by the World Bank and have not been implemented in various studies on this area.

Analytical techniques/tools explained

Regression analysis is a reliable technique of pointing out the variables which have an effect on financial exclusion. It will also help in determining the degree to which the explanatory variables influence the dependent variable. For this study, statistical analysis will be carried out using STATA 13 for Windows with the probit regression modelling technique to investigate the statistical relationship of the main demographic factors on the probability of one having an account with a formal financial institution. The most important indicators we will use are the amounts of credit and deposit to customers.

CHAPTER FOUR: RESULTS AND DISCUSSION

4.1 Descriptive Statistics

Table 1: Descriptive Statistics for the individual independent variables

Independent Variables	Obs	Mean	Std. Dev.	Min	Max
Female	35000	1.511	.5	1	2
Age	35000	34.025	15.265	15	99
Primary education or less	18183	0.533	0.372	-	-
Secondary	14903	0.414	0.377	-	-
Completed tertiary or more	1914	0.052	0.390	-	-
Income-Poorest 20%	5746	0.165	0.418	-	-
Income -Second 20%	6059	0.174	0.441	1	5
Income-Middle 20%	6508	0.187	0.488	-	-
Income-Fourth 20%	7385	0.212	0.411	-	-
Income-Richest 20%	9302	0.264	0.442	-	-
Employed	35000	0.694	0.461	0	1

In table 1, we take into consideration our individual characteristics by including categorical variables. For income, we use five categories in poorest 20%, second 20%, third 20%, fourth 20% and richest 20% although we omit the latter in the analysis. For education, we use primary education, secondary education and tertiary education although we omit the former since it provides insignificant effects in our study. Both income and education categorical variables are dummy variables equal to one if the individual belongs to the respective group, zero otherwise.

Table 2: Determinants of barriers to Financial Inclusion

Barriers to financial inclusion	Obs	Mean	Std. Dev.	Min	Max
Too far away	35000	.342	.474	0	1
Lack of Trust	35000	1.791	.505	1	4
Too expensive	35000	1.774	.554	1	4
Lack of documentation	35000	1.754	.511	1	4
Religious reasons	35000	1.967	.345	1	4
Lack of money	35000	1.309	.52	1	4
Family member already has one	35000	1.918	.422	1	4
No need for financial services	35000	1.873	.441	1	4

Geographical distance is one of the main barriers to financial inclusion because financial institutions mostly put-up banks in urban centres since the population in these areas is relatively high. Most unbanked individuals live in rural areas, and this leaves them financially excluded due to the difficulty of accessing bank branches. Not having the necessary documentation has a high positive correlation with not being included in the formal financial system.

The main barrier to owning a formal account in Sub-Saharan Africa is insufficient funds which stands at 70% which is the highest compared to the other barriers. Lack of money reduces the probability of an individual owning an account at a financial institution by 9.02% and owning a mobile money account by 7%. Some banks charge customers in order to own a mobile money account or an account at a financial institution. This barrier is closely related to financial services being too costly.

Many a time you will find that an individual does not own an account at a financial institution because their family member already has one. It reduces the probability of an individual owning an account by 27.6% which is relatively high. Lack of trust in financial institutions reduces the chances of one owning an account by 7.64%. From this we can conclude that it is not feasible for the whole economy to be included in the financial system.

Table 3: Determinants of the main financial inclusion indicators in Africa

VARIABLES	(1) Formal Saving	(2) Formal Credit	(5) Formal Account	(6) Mobile money account
female	0.0428**	0.0421**	-0.0665***	-0.0758***
	(0.0178)	(0.0209)	(0.0147)	(0.0151)
age	0.00361**	-0.00442***	0.0104***	-0.00472***
	(0.000606)	(0.000703)	(0.000484)	(0.000525)
Primary education or less	-0.398***	-0.216***	0.568***	0.321***
	(0.0133)	(0.0156)	(0.0118)	(0.0118)
Secondary education or more	0.2590***	0.143***	0.040***	0.060***
	(0.007)	(0.003)	(0.002)	(0.005)
Income-Poorest 20%	-0.210***	-0.106***	-0.038***	-0.076***
	(0.005)	(0.004)	(0.004)	(0.004)
Income-Second 20%	-0.176***	-0.0892***	-0.149***	-0.114***
	(0.006)	(0.007)	(0.005)	(0.005)
Income-Middle 20%	-0.134***	-0.076***	-0.102***	-0.166***
	(0.006)	(0.005)	(0.002)	(0.006)
Income-Fourth 20%	-0.089***	-0.050***	-0.075***	-0.122***
	(0.008)	(0.006)	(0.003)	(0.006)
Employed	-0.382***	-0.355***	0.307***	0.356***

	(0.0209)	(0.0251)	(0.0163)	(0.0170)
Constant	2.690***	2.464***	-2.277***	-1.525***
	(0.0539)	(0.0625)	(0.0437)	(0.0440)
Observations	35,000	35,000	35,000	35,000

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 3 shows the probit estimations carried out for the marginal effects of our financial inclusion indicators i.e. formal saving, formal account, formal credit and mobile money account which are the response variables.

This section analyzes how independent characteristics impact on the financial inclusion indicators. Probit estimations are carried out through Stata to explain each of the individual characteristics in the survey collected from the Global Findex data obtained, the indicators of financial inclusion are related to the individual independent variables- gender, age, income, education and employment. We omit the primary education variable since it will predictably provide insignificant effects. Another omitted variable is the fifth richest quintile.

From the table, we see that being a woman reduces the probability of owning a mobile money account by 7.58% and a formal account by 6.65%. Age has a nonlinear relation. Being in the lower income quintile has a negative relation to owning a mobile money account. An individual who earns a low income reduces the probability of owning a mobile money account by 11.4%. Highly educated individuals have a higher chance of owning a mobile money account by 32.1% and a formal account by 56.8%. Being employed within the sector economy increases the probability of an individual owning a formal account by 30.7% and a mobile money account by 35.6%. Education is positively associated with financial inclusion particularly those who have completed secondary education or more and tertiary education. Individuals in primary school or lower are less likely to take credit or save in a financial institution. The coefficients of the higher levels of education are greater showing that one is more interested in being included in the financial system as their financial literacy grows

CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

From the above study, we show how demographic variables affect financial inclusion and we assess the impact of financial inclusion on economic growth in Sub-Saharan Africa. The issue of why an individual would choose to be excluded from the financial sector has been assessed using the individual characteristics. We see that gender and education are negatively related with several barriers. We also find that income is positively related to the use of formal credit. There is low financial inclusion across developing countries, especially those in Sub-Saharan Africa. The results obtained show that the formal financial market covers about 60 percent of the population of of Sub-Saharan African countries which inadvertently means that 40 percent of the population is unbanked or not included in the financial system.

Factors including income, age, education, geographical distance, lack of trust in financial institutions, lack of money and family members owing an account are the significant determinants of financial inclusion in Sub-Saharan Africa. The policy implication for this study therefore indicates the need for governments in Sub-Saharan Africa to create and implement a financial framework that seeks to encourage individuals to participate in the formal financial market and alleviate the negative variables of financial inclusion that have been discussed above. The framework should be financially feasible, gender sensitive and gender sensitive to encourage individuals to be involved in the financial system.

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