DETERMINANTS OF FINANCIAL INCLUSION IN EAST AFRICA

BY

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DECLARATION

I declare that this dissertation is my original work and has not been previously published or submitted elsewhere for award of a degree. I also declare that this contains no material written or published by other people except where due reference is made and the author duly acknowledged.

Sign:_____ Reg. No: 16/09029

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I do hereby confirm that I have examined the master's dissertation of

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And have certified that all revisions that the dissertation panel and examiners recommended have been adequately addressed.

Sign:  Date: _____

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ABSTRACT

There is a growing focus on financial inclusion among scholars and in policy circles. This study sought to analyse the underlying determinants of financial inclusion among five East African countries- Kenya, Uganda, Tanzania, Rwanda and Burundi. The general objective of the study was to determine the determinants of financial inclusion in East Africa. Specifically, the study examined the effect of rural population size, unemployment rates, income level and interest rates on financial inclusion. Rural population was presented as the proportion of a country's population that lives in rural areas; unemployment rate as the proportion of a country's population that is unemployed; income as the annual growth rate in GDP per capita; and interest rate as the real interest rate per year. The study used domestic credit to private sector by banks as a measure of financial inclusion. This variable is representative of the usage dimension of financial inclusion. The research design used was panel data analysis with secondary data collected from the World Development Indicators database of the World Bank. The 17 year period covered by the study spanned 2000 to 2016. The data was analysed on Stata and the output from analysis provided a basis for findings and recommendations. After conducting diagnostic tests, the model adopted for the study was the fixed effects model. The study found that rural population and income are significant determinants of financial inclusion with rural population being negatively related with financial inclusion. This means that the higher the rural population of a country, the less inclusive their financial system is. Unemployment though statistically insignificant had a negative relationship with financial inclusion. Interest rates had a positive but insignificant relationship with financial inclusion. The study recommended that focused financial literacy efforts be increased in the rural areas within East Africa to promote inclusion efforts. Areas for further study as recommended by the study were that a more robust measure of financial inclusion be used as opposed to the one dimension measure adopetd for this study. Further, the study recommended the use of more variables beyond the four to achieve more representative determinants of financial inclusion.

Keywords: Financial inclusion, financial exclusion, East Africa, panel data

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DEDICATION

This research project is dedicated to my mother, Serah Wokabi. I think we made it.

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ACRONYMS AND ABBREVIATIONS

CGAP	Consultative Group to Assist the Poor
GDP	Gross Domestic Product
HDI	Human Development Index
OLS	Ordinary Least Squares
POLS	Pooled Ordinary Least Squares
WDI	World Development Indicators

OPERATIONAL DEFINITION OF TERMS

Domestic credit to private sector - Financial resources provided to the private sector by financial corporations, such as through loans, purchases of non-equity securities, and trade credits and other accounts receivable, that establish a claim for repayment. For some countries these claims include credit to public enterprises, (Were, Nzomoi & Rutto, 2012).

East Africa - The countries Kenya, Uganda, Tanzania, Rwanda and Burundi.

GDP - The market value of all final goods and services made within the borders of a nation in a year (Sullivan & Sheffrin 2005)

GDP per capita - The gross domestic product corrected for inflation divided by th e population in a country (Cuijpers, 2009)

Panel data – Standard time series data on a number of economic agents, (Hall &Urga, 2000).

Real Interest rate – The lending interest rate adjusted for inflation as measured by the GDP deflator (Scott, 2003).

Rural Population - People living in areas as defined by national statistical offices. It is often calculated as the difference between total population and urban population (Losch, Freguin-Gresh & White, 2012).

Unemployment –Unemployment covers people who are: without work, are currently available for work and are actively seeking work (Luebker, 2008)

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The financial development and progress of any nation drives its economic growth. Should it be done right, this reduces poverty by promoting easier access to finance. The availability and use of a formal financial system has its own advantages. The regulated and smooth flow of monetary resources trumps the alternative which is growth of informal avenues such as shylocks who can be exploitative. An all-encompassing financial system provides the possibility to secure and safe saving practices whilst also providing access to a myriad of financial services.

In the 1990s, the debt crisis which was characterised by competitive pressure and the threat of a bleak financial future, saw companies in the financial services industry become more risk averse and gradually shut down branches in the underprivileged areas of Britain. Institutions then shifted focus to the middle class client base. This then meant redirection of credit from poorer social groups towards the richer. This was then compounded by a deliberate process of the withdrawal of financial infrastructure. Financial capital was moved to the middle class society as well. This eventually led to reduction in development characterised by dips in per capita income.

Leyshon and Thrift were the first scholars to describe this process of withdrawing financial institutions from underprivileged areas as financial exclusion (Leyshon, 2009). It is not just the withdrawal of the financial institutions, but rather the services that accrue due to proximity of the institutions that then completes the definition. Financial inclusion has been described as the ‘the process of ensuring access to financial services and timely and adequate credit where needed by vulnerable groups such as weaker sections and low income groups at

an affordable cost' (Rangarajan Committee Report, 2008) and in a fair and transparent manner by formal institutional players (Rajput, 2017).

1.1.1 Financial Inclusion

The ability to concisely define financial inclusion is key to developing a framework and identifying the factors that drive it. However, there is no one agreed upon definition of financial inclusion as this varies depending on geographies, economic, social and financial progress of the regions in question and even the priorities of concern from both a social and economic stand-point. As earlier highlighted, financial inclusion in the most basic of definitions means unbiased access to financial services in an indiscriminate and straightforward way at affordable costs (Cnaan, Handy & Moodithaya, 2012; Sarma, 2008).The term 'Financial Inclusion' was first coined in British vocabulary when it was found that over 7 million people did not have a bank account. Fuller and Mellor (2008) approached financial inclusion as a need to come up with welfare oriented reliable and affordable financial services for all in a population. There are authors who however believe that financial inclusion is a market-driven solution aimed at alleviation of poverty (Alpana, 2007). Regardless of motivation, all authors agree that financial inclusion is the desired outcome as the marginalised in society can access financial services at an affordable rate and minimise the ravages of poverty.

The World Bank defines financial inclusion as that share of individuals and firms that use financial services i.e. transactions, payments, savings, credit and insurance. This paper focuses on the savings and credit aspects and excludes insurance. The World Bank and scholars (Johnston & Murdoch, 2002) however point out that there is a distinction between financial inclusion and access to finance. There are individuals who prefer to not access credit, others not to save. Others are not creditworthy and as such cannot have credit facilities extended to them. Lack of use of financial services in itself does not necessarily equate to a lack of access.

To understand financial inclusion in its entirety, it is imperative that the concept of financial exclusion is better understood. Leyshon and Thrift (1994) describe financial exclusion as a process, though not deliberate, that serves to prevent access to the formal financial system for some classes of people. Sinclair (2001) looks at it as the inability to access requisite financial services due to barriers such as access, conditions, pricing, publicity or self-exclusion due to perception. According to Carbo, Gardner and Molyneux (2005) financial exclusion is broadly the inability to access the financial system for some members of society. Mohan (2006) just theorises it to point to a lack of access to '*necessary, affordable, fair and safe financial services from mainstream providers*'.

Overall, financial exclusion has a lot of overlapping characteristics ranging from a lack of access to a bank account to a lack of financial knowledge. The following excerpt highlights its complex and many sided nature:

> "*The definition of financial exclusion encompasses several dimensions that describe the barriers that prevent some people from using financial services. These barriers include: physical exclusion, caused by the problems of travelling to services; access exclusion, caused by processes of risk assessment; condition exclusion, when the conditions attached to products are unsuitable or unacceptable to consumers; price exclusion, where the price of products is unaffordable; marketing exclusion, where certain consumers are unaware of products due to marketing strategies that target others; and, self-exclusion, when people decide to exclude themselves voluntarily on the basis of past rejections or fear that they would be rejected*" (Leyshon, Catrina, Burton, Knights & Signoretta, 2006, p. 161).

The World Bank (1995) has services it considers essential and to which all members of the population should have: transaction banking, savings, credit and insurance. Lack of access

to transactional banking has bad effects since it is key to the access of savings and credit and is the most popular financial provision and a lack of it is a socially excluding factor. It creates a risk for theft of cash all the while making it more difficult and expensive for individuals now forced to pay in cash. It leads to time consuming procedures which eventually re-inforce exclusion. Transaction services would include receipt of regular electronic payment e.g. wages, converting vouchers into cash, simple deposit for savings and paying bills electronically (European Commission, 2008)

Policy circles have in the recent past made financial inclusion a priority around the world. The banking industry and financial regulators have tried to bring all the underprivileged into the fray by setting initiatives for financial inclusion. More so, policy seeks to ensure that those with worthy uses for capital rightfully have access to it. Financial inclusion has even been hailed as an enabler of seven of the seventeen sustainable development goals as listed in Table 1.1. Since 2010, over 55 countries had committed to having a national strategy geared towards financial inclusion.

Table 1.1: Sustainable Development Goals that benefit from Financial Inclusion

2030 Sustainable Development Goal	Theme
SDG1	Poverty eradication
SDG2	Achieving food security
SDG3	Good health and well-being
SDG5	Gender equality and women empowerment
SDG8	Decent work and economic growth
SDG9	Supporting industry, innovation and infrastructure
SDG10	Reduced inequality

Source: Adapted from the UN Sustainable Goals (2014, p. 6)

Countries have taken bold steps such as Mexico where a presidential decree was issued to form a council whose mandate is to organise different stakeholders working towards financial inclusion in the country. Colombia on the other hand brought together different ministries to form the Financial Inclusion Committee to supervise efforts by the organ created

to promote access to financial services for the unbanked of Colombia. India took a different approach, opting to launch the National Mission on Financial Inclusion. Its mandate includes provision of access to transaction accounts by all households. Financial literacy backed with access to credit, micro-insurance and pension are also key deliverables of the Mission. Similar commissions are in place in Tanzania, Madagascar, Paraguay, Peru, Namibia and Nigeria (World Bank, 2017).

Financial inclusion has benefits towards both individuals and nations as a whole. For individuals, this is tied to increased consumption, investment in education, absorption of financial shocks and women empowerment. Overall, acceleration of economic growth and a reduction in income inequality is expected (Yikona, Slot, Geller, Hansen & Fatima, 2011). On the flipside, Financial exclusion results in the obvious difficulty in accessing credit, decline in investment, higher levels of unemployment, actual social exclusion, expensive alternative credit rates and so on (Leeladhar, 2006).

The World Bank classifies types of indicators to take into consideration when measuring financial inclusion. These are access/ penetration measured by depositors with commercial banks (per 1000 adults); availability of services measured by bank branches per 100,000 people ; usage of services measured by volume of credit and deposits as a proportion of a country's GDP and quality of products. The most commonly used indicator is number of depositors with commercial banks (per 1000 adults) (Čihák, Demirgüç-Kunt, Feyen & Levine, 2012; Naceur, Barajas & Massara, 2015). However, concerns have been raised on the use of an individual indicator as this only provides partial information on the inclusive tendencies in an economy. A more appropriate measure should consider as many aspects of financial inclusion as possible; should compare easily across countries and should be easy to compute.

1.1.2 Determinants of Financial Inclusion

Literature distinguishes between two types of financial exclusion as shown in Figure 1.1. These are involuntary self-exclusion and voluntary self-exclusion (de Koker & Jentzsch, 2011). Voluntarily self-excluded people opt not to use financial services as they may have no need for them or have cultural reasons not to. They lack faith in the formal sector or may not meet certain eligibility criteria. There is a third group; that of individuals who initially use financial services but then later withdraw. Reasons for this vary from lack of trust to bad credit records (Olaniyi, E. & Babatunde, A., 2016).

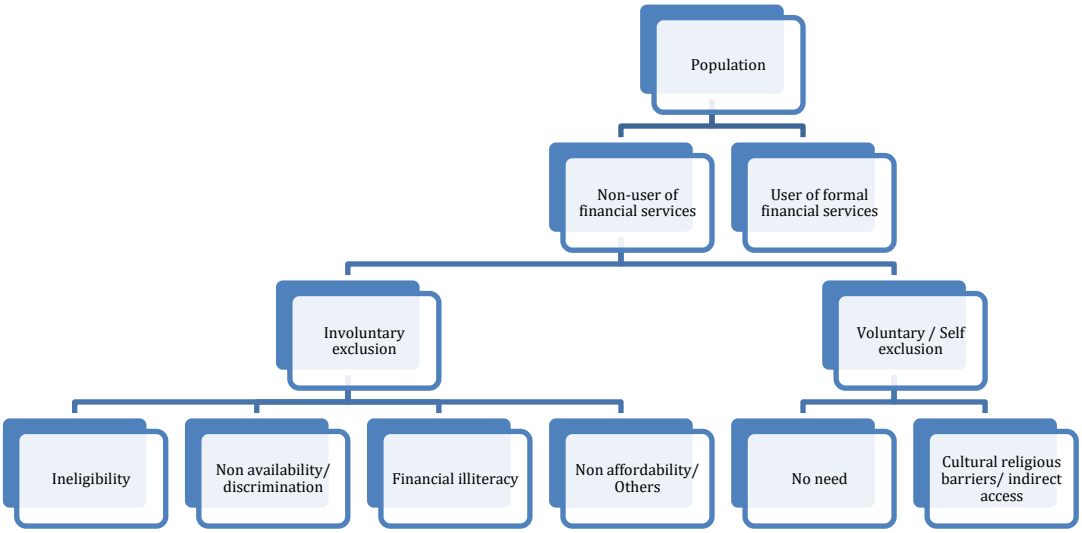

Figure 1.1: Reasons for Financial Inclusion

Source: Adapted from Claessens (2006, p. 211)

A number of models have been suggested to classify the barriers to financial inclusion. Overall, an agreement on the existence of supply side and demand side barriers has been reached. On the supply side, literature explains how the structure, set up and accessibility of financial institutions leads to the unbanked status of some households. Households considered to be poor will mostly borrow for needs that offer no returns such as health care and weddings

as illustrated in Figure 1.2. This could make banks reluctant to offer the loans as there is no guarantee of pay-back (Claessens, 2006).

The definition of core versus non-core business is another barrier. The poor may be interested in making payments and remittances which is expected in developing countries. Credit provision is however what most banks consider core and financial regimes with interest rate ceilings have also supported this idea (Claessens, 2006). The traditional role of banks has to be challenged in the developing market to ensure inclusivity for all. Areas with poor security or low population density pose a problem to banks as this adds to the cost of doing business for banks.

As shown in Figure 1.2, transactions by the poor may be small in size and this translates to the inability of each transaction to bear the high burden of variable or fixed cost. Weak systems i.e. legal and information infrastructure may affect the need for institutions to reach the unbanked (Claessens, 2006). These weak systems increase risk and cost of services thus making business propositions economically unrealistic. Market failures such as asymmetrical information, monopoly or oligopoly in the financial market and entry barriers to new competitors mean barriers for part of the population that will be excluded for reasons of price, risk and reduced supply (Claessens, 2006). Other supply side determinants include distance from branch, branch timings, language, staff attitude and tedious documentation and procedures. Overall, Supply side determinants have as a key effect, increased transactional costs.

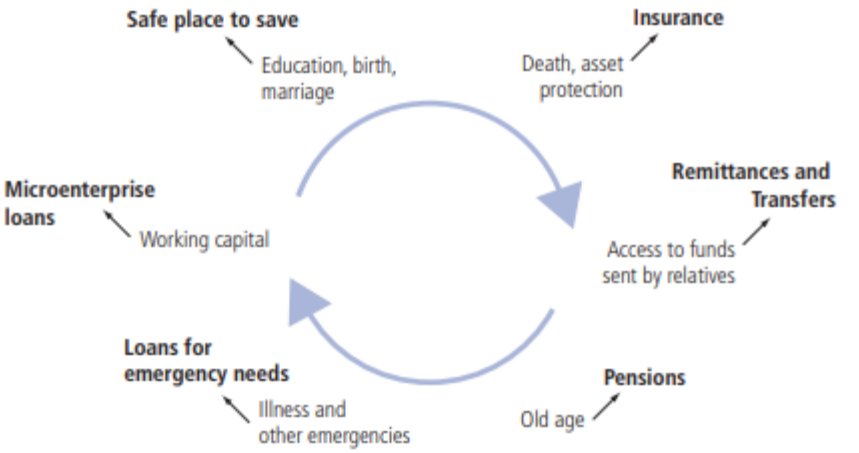

Figure 1.2: Evolving needs for Financial Services by the poor

Source: Brigit Helms (2006, p. 23)

Price and income are the predominant demand side economic barriers to access to financial services (Beck and De la Torre, 2006). The low (financial) literacy levels result in lower demand for services from formal providers (Honohan and King, 2009). Where there is less developed financial infrastructure, or just remote populations, then non-availability of formal financial services is expected (Beck, Demirguc-Kunt & Martinea Peria, 2005). This is a particular concern in Africa as remote populations are expected in some countries. Proximity and ease of use are other barriers. Ease of use translates to documentation required, this has affected the Indians especially, language and wait time. In some population segments in Africa, cultural and religious factors also play a role. This then points to cultures where women are not allowed to have property also being excluded from having a bank account. Overall though, occurrences of financial exclusion/ inclusion can be explained in relation to many facets of finance as illustrated in Table 1.2.

Table 1.2: Paradigm of Financial Inclusion

Aspect	What Financial Inclusion Means	When Financial Exclusion Could Occur
Product	• Range of products and services – Access to sound pragmatic and transparent advice on financial services – Access to bank accounts and savings mechanisms – Access to affordable and flexible credit for consumption purposes – Access to affordable and flexible livelihood financing – Access to risk mitigation services like health, weather, asset and life insurance etc. – Access to vulnerability reducing and economic capacity enhancing financial services like Warehouse Receipt financing, Value Chain financing etc. – Access to other financial services like micro-pensions • Flexible and customized products with high quality services • Access to products helps develop secured livelihoods	• Exclusion could occur when products are not convenient, inflexible, not customized and of low quality. • In East Africa, the products really should be geared towards Agriculture.
Price	• Affordable and competitive products and mechanisms • Effective cost of product is neither usurious nor perceived as very high • Inefficiencies are not passed on	• Exclusion could occur when products are unaffordable.
Awareness	• The product needs to be proactively promoted • All terms and conditions must be explained in detail and transparently • Focus on customer service, education and protection	• Exclusion could occur when clients lack awareness.
Delivery	• Simple and convenient process of delivery • Accessible in remote areas • Lower transaction cost for clients • Documentation and other requirements are minimal	• Exclusion could occur when clients cannot be reached easily and at low transactional costs
People and Attitude	• Staff care for the client's welfare always • Staff deal with clients in a timely, patient and concerned manner • Staff are specially trained to deal with the poor	• Exclusion could occur when staff delivering services are not well suited to their role

Source: *Adapted from Arunachalam, Ramesh S (2008, p. 8)*

1.1.3 Financial Inclusion in Africa

Focus on financial inclusion is mostly on banking and credit and savings services offered by banks. A study by Demirguc-Kunt and Klapper (2012) found that 23% of the adults in Africa hold formal bank accounts. This figure however varies depending on the region under study. Only 24% of adults in Sub-Saharan Africa have an account, though for Southern Africa this is at 51% compared against the 11% of Central Africa. North Africa had 20% of its adults banked with Eastern Africa at 28%. This however varies within the countries themselves.

In Africa, the adult population with a bank account is highest in Mauritius at 80% and South Africa at 54%. More than 10 countries have less than 10% of their adult population banked. These include Guinea, Niger, Congo and Central African Republic. These statistics compare against high income nations of the world where account ownership stands at 89% (Demirguc-Kunt and Klapper, 2012).

Mobile money innovations have promoted financial inclusion in Africa with Kenya being a pioneer. Even with such strides, exclusion is still happening on other fronts. Gender inequality is driving the rift, where 30% of women in Sub-Saharan Africa have an account compared to 39% of the men. Only 25% of adults in the poorest 40% of households have an account compared to the 46% of the richest 60% (Demirguc-Kunt & Klapper, 2012).

Some of the reasons given for the poor comparison include the amount required to operate an account. In Sierra Leone and Uganda, a sum equivalent of 50% of per capita GDP is required to open a checking account. Uganda and Zimbabwe further have a unique challenge where maintenance fees for a checking account amount to a fifth of the per capita GDP. Some countries in the developed nations do not have a fee to the checking account (Beck & Demirgüç-Kunt, 2006; Oyelami, Saibu & Odenkule, 2017)

Literature has further divided barriers to financial inclusion into demand side and supply side factors. Honohan and King (2009) deduced that for certain African countries, key

demand side factors promoting formal banking are education and income and that better financial sector knowledge coupled with increased trust in banks increased the chances of one being formally banked. On the supply side, distance to services/ urban-rural divide was a key barrier.

With this kind of insight, it becomes easier to then tailor financial services products that counter each barrier. Where distance to services is the problem, the use of agency banking (Arnold, Beck, & Ellis, 2011) as adopted in Kenya can offer a solution. Where the challenge is financial knowledge, financial literacy drives can be sponsored by the government to then reduce the prevalence of financial illiteracy (Gardeva & Rhyne, 2011).

1.1.4 Financial Inclusion in East Africa

Owing to the nature of borrowing that the low income households have to make, they have devised their own mechanism of saving and borrowing. Self-help groups are prevalent in Kenya, Tanzania, Uganda, Burundi and Rwanda. They were started by women who would pool together savings for redistribution among them for purposes of household growth. These have now turned into groups where savings pooled are used to venture into profit oriented initiatives. Some of these can be registered by government ministries as investment companies. Self-help groups have transformed the lives of rural women and managed to foster their economic development (Bongomin, Munene, Mpeera & Akol., 2017)

To further formalise the self-help groups, (MFIs) have also stepped up to try and expand savings among the unbanked of the society. Most MFIs are in partnership with global donors seeking financial deepening. MFIs have the advantage of closing gaps seemingly unattractive to mainstream banking sector. The underprivileged in society introduce a cost to financial institutions where products tailored for them have to be lower priced to encourage adoption. Professor Muhammad Yunus, founder of the Grameen Bank of Bangladesh and Nobel Peace

Laureate, wanted to show that these poor can be banked should the right lending mechanism be adopted (Yunus, 1999).

As per Allen, Demirguc-Kunt, Klapper, Martinez and Maria (2016), any involuntary financial exclusion warrants policy intervention. Closer home, in East Africa, strides are being made to ensure that access to financial services for all is promoted. Some countries like Burundi, based on a World Bank report dated 2017 had only 7% of its population with a bank account. Uganda in 2017 launched its National Financial Inclusion Strategy 2017-2022. The strategy seeks to reduce financial exclusion to 5% by 2022. Rwanda on the other hand considers financial inclusion an integral enabler to achieving its development and poverty reduction objectives. Rwanda aims for a 90% financial inclusion by 2020. Tanzania also has in place a National Financial Inclusion Framework (NFIF 2018-2022) whose objective is to drive provision of financial goods and services that serve individuals and business needs in line with supporting livelihood and job creation.

1.2 Statement of the Problem

Financial inclusion has been considered instrumental in alleviation of poverty and promotion of financial prosperity in many countries. This is evidenced by the growing concern and emphasis by many countries to put in place mechanisms to ensure that all socio-economic circles receive indiscriminate access to financial services as would best serve their needs. Several studies have been conducted to indicate this. In Mongolia, a study found a significant relationship between group loans and food consumption with food being more and healthier (Attanasio, Britta, Ralph, Emla & Heike, 2011). A study by Bauchet, Cristobal, Laura, Jeanette and Yalouris (2011) suggested that financial services positively influence self-employment, business activities and even household consumption. In South Africa, access to consumer credit increased borrower's wellbeing, status in community and even income and food consumption (Karlan & Zinman, 2010).

On a more macroeconomic level, greater financial inclusion translates to government's reduced costs when executing social policies. Over 25% of variation across countries in poverty reduction rates is attributable to cross country variation in financial development (Beck, Demirgüç-Kunt & Levine 2007). The World Bank through a 2012 study suggested that increased financial inclusion also increases financial stability.

Even with focus on increasing access to financial services for all, there is still a need to understand the factors hindering nationals from having bank accounts, saving in them and even seeking credit. To improve access to financial services, it is imperative that governments, financial institutions and their partners also make an effort to understand and therefore remove any barriers that hamper development due to financial exclusion.In the last decade, research has been conducted to determine reasons for formal financial exclusion. Most studies centre on the idea of a 'household' and seek to identify the reasons why these remain unbanked. Beck and Brown (2011) found that the use of banking products is more common in households where there is higher income, formal employment, adults have higher education and are located in the urban areas.

There is a general consensus therefore that financial inclusion is imperative for economic development However, few studies have been undertaken with a focus on determinants of financial inclusion for the countries in East Africa. The studies have been on a global scale with some African countries being quoted and cited. For this reason, the author pursued this research to study the variables that influences the level of financial inclusion in the East African countries and thus provide a framework against which policy can be formulated and implemented to increase financial inclusion.

1.3 General Objective

The general objective of this study was to empirically test the determinants of financial inclusion among East African Countries.

1.3.1 Specific Objectives

The objectives of this study were:

i) To determine the effect of rural population size on financial inclusion among East African countries

ii) To determine how income level influences financial inclusion among East African countries

iii) To determine the influence of unemployment rates on financial inclusion among East African countries

iv) To examine how interest rates influence financial inclusion among East African countries

1.4 Research questions

The study was governed by the following questions:

i) How does the rural population size of a country influence financial inclusion?

ii) How does income level influence financial inclusion in a country?

iii) How do unemployment rates in a country influence financial inclusion?

iv) How do interest rates influence financial inclusion in a country?

1.5 Justification of the study

Financial inclusion plays a major part in the financial development of a country. Organisation of finance in a more formal way gives rise to savings mobilisation, risk management, information gathering on possible opportunities for investment, exerts some degree of control and facilitates the exchange of services. These overall serve to reduce poverty (DFID, 2004). There is however a shortage of research on the determinants of financial inclusion in East Africa. Among emerging and developing countries, Africa has the least account ownership(Mehrotra & Yetman, 2015), with Burundi, one of East Africa's countries having only 7% of its population with a bank account as stated earlier. Four of the five countries under study feature in the list of 41 countries worldwide with the least Human Development Index

(HDI) ranking. The Human Development Index is a composite index measuring average achievement in three basic dimensions of human development—a long and healthy life, knowledge and a decent standard of living.

For researchers and students, this study shall contribute to the body of knowledge on determinants of financial inclusion in the East African region. Consultants and policy makers shall also be equipped to provide feasible and informed advice to financial institutions, governments and other players in the finance space. For the general public, anyone wishing to further their knowledge on the subject shall be highly impacted.

1.6 Scope of the Study

This study was focused on determinants and extent to which these determinants influenced financial inclusion in 5 East African countries between 2000 and 2016. The study was limited to Kenya, Uganda, Tanzania, Burundi and Rwanda.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter presents the review of related literature (theoretical and empirical) relating to the study variables. The chapter looks at the theories guiding the study, conceptual review of study variables, empirical research and summary of literature review and knowledge gaps.

2.2 Theoretical Review

This study was guided by two theories; The Finance Growth Nexus Theory and The Theory of Information Asymmetry.

2.2.1 Finance-Growth Nexus Theory

Framed against assumptions of perfect information, frictionless economy and mobile resources, the theory demonstrates the link between financial spheres and the real economy. First proposed by Walter Bagehot (1873), the finance-growth nexus theory points to how events in the money market affect capital spill overs in an economy as people seek the most profitable and worthy ways to use funds. Essentially, loanable funds spur economic activity. There is a multiplicative effect in the advancement of credit.

Bagehot predicted that "capital will run as surely and instantly where it is wanted and where there is most to be made of it, as water runs to find its level" (Bagehot , 1873 p.12). What Bagehot postulated was the role of financial systems in collating resources and allocating them to the most profitable enterprises. Further build up on the theory by Schumpeter in the first half of the 20th century argued that innovation was the driver to economic growth. Innovation could be in terms of production, new ways of producing existing goods and even new market developments (Stolbov, 2012). This could also be extended to new offerings by banks. He insisted thought that this was only possible through administrative powers and

through the issuance of bank loans i.e. access to credit. The growth of any economy still boils down to access to credit, an element of financial inclusion.

Financial inclusion then and corresponding growth will be reflected in the growth in the economy. Marwa and Zhanje (2015) hypothesized that the informal sector (financially excluded sector) is significantly large in developing countries, the conventional finance-growth theory could underestimate the impact of finance on economic growth but provides a basis for development of models that breaks down finance enterprises into sub-groups for achievement of better results. This theory forms a pillar in identifying characteristics that influence financial inclusion among those in the informal sector and identifies the need for funds to be provided where they are most needed. It further points to the role that financial institutions play in bridging the financial inclusion gap through innovatively bringing the excluded into the fray. This is essentially the definition of financial inclusion. The theory therefore sets the tone for the case for financial inclusion and the need for policies to be in place to promote the same.

2.2.2 The Theory of Asymmetric Information

This theory was proposed in the 1970s and 1980s by George Akerlof in the 1970 paper, "The Market for 'Lemons': Quality Uncertainty and the Market Mechanism". Michael Spence and Joseph Stiglitz in due time also made noteworthy contributions. The theory observes that inefficient outcomes in the market can be as a result of imbalance between buyers and sellers. Richard (2011) suggested that moral hazard and adverse selection result from information asymmetry This increases risk and cost of services thus making business propositions economically unrealistic The asymmetrical information between borrowers and lenders translates to barriers for part of the population that will be excluded for reasons of price, risk and reduced supply (Claessens, 2006). Overall, this can contribute to reduction in credit and as such culminate in financial exclusion. Adverse selection leads financial institutions to ration the credit that they can advance. As with the laws of demand and supply, where supply reduces

without much change in demand, prices increase. Credit is advanced at a much higher interest rate. This then leads to financial exclusion on a cost basis.

Moral hazard is the risk which a party to a credit advance transaction provides misleading information about its assets, liabilities or credit capacity. This is noted to be contributing to non-performing Loans. Overall, information asymmetry makes it difficult to distinguish between good and not-so-good borrowers. The theory pre-empts the main objective the study- the determinants of financial inclusion. It explains how and why some financial inclusion efforts fail due to non-disclosure of pertinent information leading to mistrust between the public and financial institutions. A lack of transparency on the prevailing circumstances of a borrower including income level and employment status can deter financial inclusion efforts.

2.3 Empirical Review

In the following section the study reviews related literature to the current research.

2.3.1 Rural Population and Financial Inclusion

Any challenges that hamper efforts towards financial inclusion at a national level are even more pronounced in rural areas (De Olloqui, Andrade & Herrera, 2015). The sparse population density coupled by low income levels make a case for high operating costs which is then not attractive for mainstream financial services providers. This is further compounded by the population's low rate of property ownership which then translates to a lack of collateral should credit be sought. The users have limited financial capacities thus restricting demand, whereas the financial institutions provide services not quite suited to the needs of the population Villarreal, Stefanie, Jesus and Jesus (2017).

Historical evidence alludes to the fact that no country has reduced poverty without addressing the need to increase productivity in the agricultural sector (Timmer, 2009). This then ensures that a country is food sufficient, has surpluses and also has financial resources to support a country's urbanization and industrialization agenda. The countries in East Africa rely

on Agriculture as an economic activity; this is mostly practiced in the rural areas. Villarreal et al. (2017) identified significant financial exclusion among small scale rural producers for five countries: Mexico, Honduras, El Salvador, Costa Rica and Dominican Republic.

Thorat (2007) pointed out that financial inclusion in rural areas stood at 39% compared against 60% in urban areas. Allen et al. (2014) on the other hand were able to show that population density in Africa is more significant in terms of explaining financial inclusion in Africa than anywhere else in the world. Leylon and Thrift (1995) and Kempson and Whyley (2001) also point out that the rural population and people living in remote locations have a higher chance of being financially excluded.

While measuring factors that influence financial inclusion indices, literature points to the relationship between rural population and financial inclusion (Sarma & Pais, 2008; Yorulmaz, 2016). Findings by Yorulmaz (2016) indicate a negative relationship between rural population and financial inclusion. He concurs with the general observation that as one goes into rural parts of a country, financial inclusion levels overall decrease. There are fewer bank branches in rural areas and even these are spread far and thin. A bleak example is rural Madagascar where there exists one bank branch for 1.4 million people (CGAR, 2009).

According to Arunachalam (2008), inclusion is not about accessing the poor but also removing any barriers and structural inequalities they may face. Geographical location and population density affect the levels of financial inclusion. Mohan (2006) views the cost of expanding institutional credit in rural areas likely to be high due to lack of infrastructure, risk perception and geographical spread of rural areas, most of which are sparsely populated.

The composition of the rural population may have a role to play as well. As pointed out above, most are farmers. However, there is another aspect to consider, gender. Though the disparity is not high, there may be cultural restrictions on ownership of an account or property by women. Studies by the World Bank (Demirguc-Kunt & Klapper, 2012) show that women

in developing countries are 20% less likely than men to have an accounts. A reason mainly cited by women for not having a formal account is the fact that another family member already has one. This remains a rich ground for policy implementation towards achieving higher rates of financial inclusion. Gender (being female) affects measures of financial inclusion both directly and indirectly through gender gaps in remuneration (income), literacy and employment status.

2.3.2 Income levels and Financial Inclusion

Literature on financial inclusion identifies financial exclusion as a reflection of a broader problem of social exclusion. In nations characterized by high levels of industrialization and high levels of income, studies show that exclusion from the formal financial system occurs to people in the low-income groups, ethnic minorities and the elderly among others (Barr, 2004; Kempson & Whyley, 1998; Connoly & Hajaj, 2001). Countries that exhibit low levels of income inequality have high levels of financial inclusion (Buckland, Anderson, Burnham & Jeffrey, 2005 and Kempson & Whyley, 1998).

Kempson and Jones (2000) concluded that financial exclusion is majorly a function of having low income.Sinha and Subramanian (2007) then postulated that the leading cause of financial exclusion is a lack of steady income. The insignificant income gives them little incentive to open a savings account and as such, they are not eligible for a loan. The percentage of population living below the poverty line definitely influences the level of financial exclusion (Goyal, 2013). Mandira and Pais (2008) found out that income as measures by per capita GDP is an important factor in determining the level of financial inclusion in a country and that a household's economic status is positively correlated with degree of financial inclusion. This was in their cross country analysis of 49 countries using data for the year 2004.

Loury (1981) set out to understand the impact of increasing financial access on poverty and inequality. His model focused on the transmission of inequality from generation to

generation; where parents could not raise(borrow) funds to invest in their children's human capital development, then their children also ended up poor and the cycle of inequality was propagated. Should barriers be relaxed, the persistence of inequality could be broken over time.

Jacoby (1994) found that the lack of access to credit ensured persistence in poverty as the poor ended up reducing amounts spent on their children's education. This was also confirmed by Jacoby and Skoufias (1997) in their study of Indian villages. Child labour rates are even higher in countries with poorly developed financial systems (Dehejia & Gatti, 2003). This in itself creates a both a result and cause of financial exclusion.

Kempson and Whyley (1999) in a study of the UK population identified single parents, minority ethnic groups, households with only one breadwinner and people who left education early as among those constituting the largest share of the financially excluded. This was confirmed by Goodwin, Adelman and Middleton (2000).Financial literacy and awareness shall determine the extent to which financial products are accessed and used. Arunachalam (2008) states that financial literacy of the poor shall enhance uptake of financial products and services. Therefore, high illiteracy/ a lack of education in a nation's population shall affect financial inclusion (Amaeshi, 2006; Devlin 2009; Mitton, 2008; Solo, 2008).

2.3.3 Unemployment and Financial Inclusion

Goodwin Adelman and Middleton (2000) identified that employment can be associated with financial inclusion. Allen et al. (2016) while studying individual characteristics for a total of 123 countries identify that financial exclusion is likely to occur for people with lower incomes. Camara, Pena and Tuesta (2014) have similar findings for a study of the households of Peru. Hoyos, Pena and Tuesta (2014) while studying Mexico draw the conclusion that being an employed female promotes financial inclusion. These findings resonate with Tuesta, Sorensen, Haring and Camara (2015) in their study of Argentina.

It is less likely for the unemployed, those with irregular income and those with insecure employment to take part in the financial system. In the UK it was identified that payment of wages through automated cash transfer promoted financial inclusion (Goodwin Adelman & Middleton, 2000). Financial exclusion is significantly propagated by payment of social security benefits and state pension in cash (Kempson & Whyley, 1999).Argentina in 2001 made it mandatory for all firms to pay their employees' wages through a bank account. These accounts, referred to as wage accounts, attract no charges to the owner since May 2010. This development led to a significant increase in number of banked people in Argentina (Tuesta, et al., 2015). In 2008, Ireland through the Survey of Income and Living Conditions (SILC) established that 34% of households headed by an unemployed person did not have a bank current account. Further, 88% of unemployed Irish did not have any form of savings account (Russel, Maitre & Donnelly, 2011).

In less developed countries, the informal economy accounts for a significant share of the employed. Formal sector employment in the world implies participation in the formal financial system as wages and salaries are channeled through the formal banking system (ILO, 2001).Formal employment indicates inclusion in employment related social security system whose benefits are availed through the formal banking system. The proportion of formal sector employment should be a good indicator of the degree of financial inclusion. Findings by Yorulmaz (2016) indicate that unemployment is negatively related with financial inclusion thus affirming that the unemployed and the irregularly employed will be less likely to be formally included. Bendig, Giesbert and Steiner (2009) found that literacy, ownership of assets and employment status enhanced adoption of financial services in Ghana.

2.3.4 Interest Rates and Financial Inclusion

Interest rates show the cost of capital in the banking system or the attractiveness of the banking system. Boyd and De Nicolo (2005) observed that reducing loan rates as a result of bank

competition assists borrowers to repay loans contributing to lower default risk. The real interest rate is the interest rate an investor, lender or saver should receive after allowing for inflation. Thingalaya, Moodithaya and Shetty (2010) point out that appropriateness if financial products and marketing of the same is crucial to encouraging financial inclusion. Should products be poor quality, inconvenient in any way or not customized, financial exclusion is bound to be the end result (Arunachalam, 2008; Basu & Srivastava, 2005). Consumers are not looking for second in class versions of the mainstream products. They too are interested in the attractive offers. However, the financial services industry in its growing need to expand has a greater orientation towards profit. This ultimately creates a divide between profitable customers that the players in the industry are willing to woo, and those they will seek to avoid.

One of the oldest methods of consumer protection is interest rate ceilings. Interest rates can be manipulated as part of government monetary policy depending on the motive. Interest rate capping dates its history back to 1750 BC Babylon (Seman, 2016). Kenya has recently introduced interest capping in a bid to make credit more attractive and encourage investment. High interest rates can have the opposite effect. An argument by Consultative Group to Assist the Poor (CGAP) (2009) indicates that interest rate capping does however hamper credit expansion making it expensive for consumers even if it was meant to protect them. Based on their research, there is no pattern for countries/regions with or without interest rate capping and the overall interest rate. Sarma and Pais (2008) on the other hand depict an actual relationship between interest rates and credit expansion.

Mehrotra and Yetman (2015) in their argument for use of policy to promote financial inclusion point out the expected increase in interest bearing bank deposits which directly speaks to financial inclusion. This means that interest rates can directly influence financial access leading to more economic activities benefitting from the use of interest rates as a policy tool (Khan, 2011; Tombini, 2012).

2.3.5 Knowledge Gap

Different scholars have undertaken the study of financial inclusion hoping to shed light on its many facets. The factors that influence financial inclusion have been studied at great length but little effort has been made to empirically determine these determinants, more so in East Africa. Existing studies have further been focused on the measurement and promotion of financial inclusion, or the deepening of finance in the region while quite ignoring the empirical evaluation of its determinants and impacts.

There are expanding contributions to literature focusing on individual countries such as India (Kumar, 2013; Thingalaya, Moodithaya & Shetty, 2010), Argentina (Tuesta, 2015) and Nigeria (Okoroafor, Adeniji & Awe, 2018) among others. However there have been none specific to the East African region. Allen et al. (2016) in their study of financial inclusion determinants did not study Rwanda and Tanzania. Demigurc-Kunt and Klapper (2013) in their paper on measuring financial inclusion use data on all countries but exclude the northern region of Uganda. The excluded population is 10% of the adult population.Olaniyi and Babatunde (2016) in their study across Sub-Saharan Africa only include Kenya in the 15 country sample.

This study shall therefore be a contribution to the scholarly understanding of the determinants of financial inclusion in East Africa. It shall add to the body of literature and to work by scholars like Zins and Weill. (2016). The study shall fill the knowledge gap by analyzing determinants of financial inclusion in East Africa using panel data for 5 countries over the period 2000-2016.

2.4 Conceptual Framework

Miles and Huberman (1994) define a conceptual framework as a "visual or written product that explains either graphically or in narrative form, the main things to be studied—the key factors, concepts, or variables—and the presumed relationships among them" (p. 18). It is primarily a conception that the author intends to study. Figure 2.1 illustrates the intended conceptual

framework for the study of the determinants of financial inclusion in East Africa. The independent variables to explain financial inclusion are rural population, income levels, unemployment rate and real interest rate.

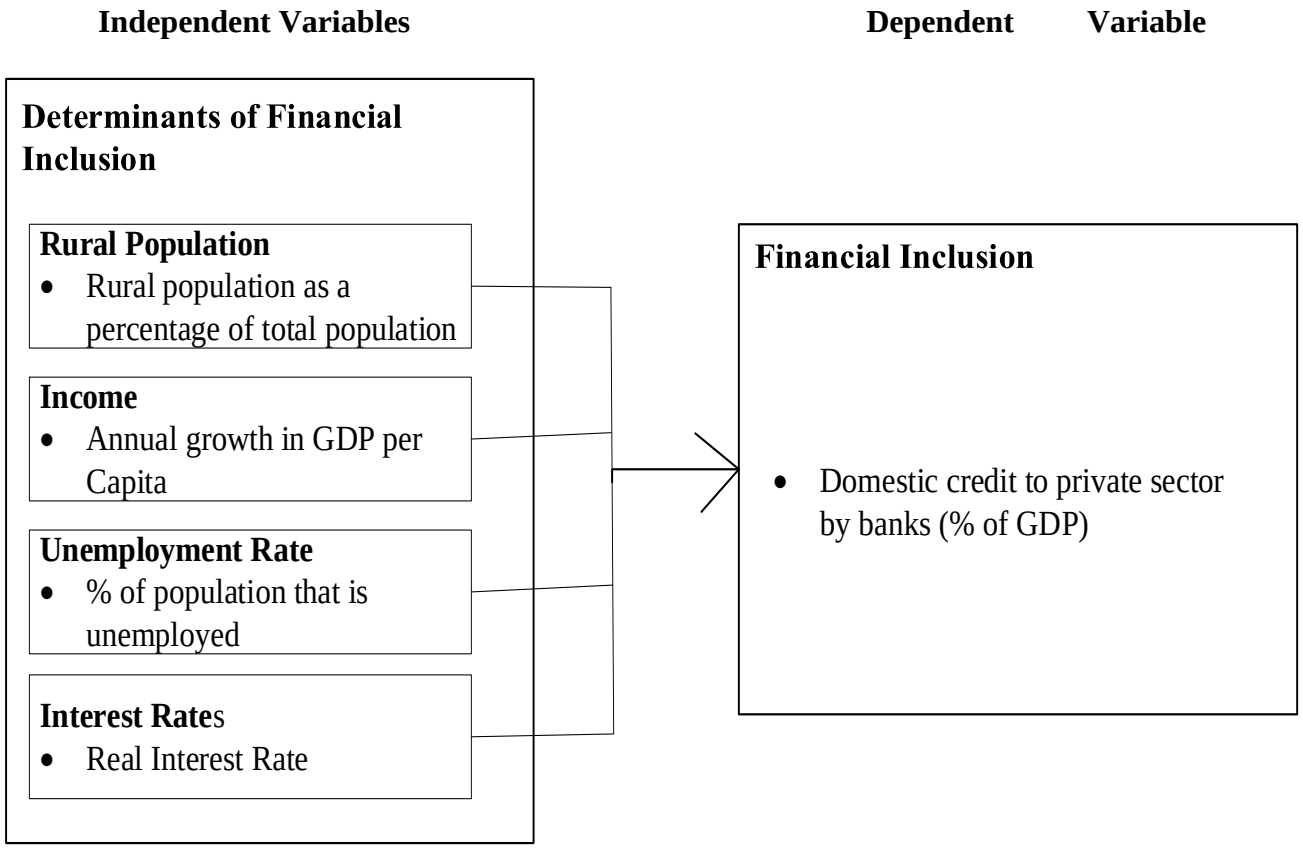

Figure 2.1: Conceptual Model

2.5 Operationalisation of variables

Table 2.1 below show the operationalisation of variables in the study.

Table 2.1: Operationalisation of Variables

Variable	Variable Type	Indicators	Denoted by	Measurement Type
Rural Population	Independent Variable	Rural population of a country as a percentage of total population	RuP	Ratio
Income	Independent Variable	Growth in GDP per capita (2010 USD)	Inc	Ratio
Unemployment rate	Independent Variable	Unemployed population as a percentage of total labour force	Une	Ratio
Interest rate	Independent Variable	Real interest rate	Int	Ratio
Financial Inclusion	Dependent Variable	Domestic credit to private sector by banks (% of GDP)	Y	Ratio

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter covers the following sections: the study design, the target population, sample frame and the sample and sampling procedures. This chapter captures instrumentation, data collection methods as well as data analysis techniques.

3.2 Research Design

This study used a cross country panel design. Panel design aims to provide multiple observations across the population under examination. This specific design focused on East African countries which are considered part of the developing world. Observations in panel data involve at least two dimensions, the cross sectional one and the time series dimension. Panel data contains more degrees of freedom (Hsiao, 2007), has greater capacity to capture complexity of behaviour, and uncovers dynamic relationships - "Economic behaviour is inherently dynamic so that most econometrically interesting relationship are explicitly or implicitly dynamic"(Nerlove, 2002, p.5) and controls the impact of omitted variables.

3.3 Target Population

Target population in statistics is the defined population from which a sample has been properly selected (Banerjee & Chaudhury, 2010). A population on the other hand is a well-defined or set of people, services, elements, and events, group of things or households that are being investigated. This definition ensures that population of interest is homogeneous. The population for this study was 5 countries drawn from East Africa between 2000 and 2016. The countries are Kenya, Uganda, Tanzania, Burundi and Rwanda.

3.4 Sampling and Sampling Procedure

The study adopted a census sample since data to be gathered was on each country that was considered in the study. A census study occurs if the entire population is very small or it is

reasonable to include the entire population (Kulshreshtha, 2013). The unit of analysis for the study is East Africa with the units of observation being the (five) individual countries.

3.5 Research Instrument and Data Collection

Only secondary methods of data collection were involved as only secondary data was used for the study. Secondary data was collected from the World Development Indicators database of the World Bank for the period 2000-2016. The data was collected using a researcher completed instrument, a data collection sheet as attached in Appendix 1.

Secondary data was collected on domestic credit to private sector by banks (as a percentage of GDP) that served as the dependent variable. The data collected for indicator variables was rural population, GDP per capita, unemployment rate and real interest rates for Kenya, Uganda, Tanzania, Burundi and Rwanda. Data availability constraints limited the period under observation to 2000-2016.

3.6 Data Analysis and Presentation

This study collected quantitative data. After data collection, the data was edited in readiness for analysis by the researcher. This study used the STATA software to analyse the collected data. The output of the analysis was presented using statistical and graphical techniques. Statistical techniques used involved measures of central tendency (mean, median and mode) and measures of dispersion such as standard deviation and variance. Graphical techniques involved the diagrammatic representation by use of tables and charts.

3.6.1 Econometric Model: Panel Data Analysis

The study involved the use of balanced, panel data estimation techniques. The variables are expressed as explained below:

Dependent variable

Y: Domestic credit to private sector by banks (as a % of GDP)

Independent variables

RuP: Rural Population

Inc: GDP per capita

Une: Unemployment rate

Int: Real Interest rates

The basic functional form of the model was:

$$Y_{i,j} = \beta_0 + \beta_1 X_{ij} + \alpha_i + \varepsilon_{ij} \quad (3.1)$$

Y_{ij}represents the value of the dependent variable, measuring financial inclusion for the ith state and tth period. β_0 is the intercept term and β_1 the matrix of explanatory variables of financial inclusion. X_{ij} is the vector of associated parameters. α_i is treated as a random variable with a specified probability distribution in case of random effects model, whereas a set of fixed parameters in fixed effects model.ε_{ij} is the disturbance term following a normal distribution.

Fitting the model. The first model to be fitted was the Pooled Ordinary Least Squares which is the basic regression model as follows:

$$Y_{i,t} = \beta_0 + \beta_1 RuP_{1i,t} + \beta_2 Inc_{2i,t} + \beta_3 Une_{3i,t} + \beta_4 Int_{4i,t} + \varepsilon_{i,t} \quad (3.2)$$

The Fixed Effects model was as follows:

$$Y_{i,t} = \beta_0 + \beta_1 RuP_{1i,t} + \beta_2 Inc_{2i,t} + \beta_3 Une_{3i,t} + \beta_4 Int_{4i,t} + \alpha_i + \varepsilon_{i,t} \quad (3.3)$$

where α_i is the dummy accounting for any fixed effects

The Random Effects model was as follows:

$$Y_{i,t} = \beta_0 + \beta_1 RuP_{1i,t} + \beta_2 Inc_{2i,t} + \beta_3 Une_{3i,t} + \beta_4 Int_{4i,t} + \lambda_i + \varepsilon_{i,t} \quad (3.4)$$

where λ_i is the dummy accounting for any random effects

3.6.2 Exploratory Results

Before fitting the model, the author performed the following: exploratory data analysis, diagnostic analysis and other diagnostics as explained below.

1. Exploratory Data Analysis -Visual plots. The author provided visual plots for the dependent variable. This exploration involved within firm and between firm analyses. For within firm (country), the author used growth plots. The output helped determine the presence of time-related fixed effects. For between firm (country) visual analyses, the author used overlain plots to check if the intercept was the same for countries or varied over countries. The plots indicated that the countries have different intercepts implying that fixed effects exist and as such, a fixed effect model was appropriate for analysis. This however was further confirmed using diagnostic tests.

Exploratory Data Analysis - Draw a correlation matrix for independent variables. No two independent variables should have very high correlation. Drawing a correlation matrix precluded the problem of multicolinearity. Where any two variables were very highly correlated, i.e. a correlation >0.8, it was expected that one be dropped from the regression analysis.

Exploratory Data Analysis - Other specifications. The author checked stationarity in the panel data using the Levin-Li-Chu unit root test.

Provide descriptive statistics. For the dependent variables the author provided overall, between and within statistics.

2. Diagnostic Tests. In the diagnostic tests, the author checked for the appropriateness of the model to use. Either the Pooled Ordinary Least Squares or the Panel Data Models i.e. Fixed Effect or Random Effects. The author used: the Hausman test to choose between Random Effects and Fixed Effects models and the Modified Chow Test to choose between Fixed Effects

and Pooled Ordinary Least Squares models. The first set of analysis, the Hausman test, recommended the fixed effects model over the random effects model. The modified chow test eliminated the pooled ordinary least squares model. As the fixed effects model was chosen, the author checked for the existence of time related fixed effects. Since these did not exist, dummy variables were not included in the model.

3. Other Diagnostics. Since the Fixed Effects model was chosen, the author used the modified Wald Test to test for heteroscedasticity. Further, the author checked if the residuals were normally distributed using either PP or QQ plots.

CHAPTER FOUR

DATA ANALYSIS, FINDINGS AND DISCUSSION

4.1 Introduction

The general objective of this study was to determine the determinants of financial inclusion in East Africa. To achieve this objective, specific objectives were set to ascertain the effect of unemployment rates, income, rural population and interest rates on financial inclusion. This chapter contains the empirical analysis of the study and in detail discusses the analysis of the descriptive statistics of the data, the choice of model to fit the panel data and the post estimation analysis. Results are mainly presented in graphs and tables.

4.2 Descriptive Statistics

Table 4.1 below is a representation of descriptive statistics and distribution of variables as considered for this study: Domestic credit to private sector by banks (% of GDP), income, unemployment rate and interest rates. The descriptive statistics considered were mean, maximum, minimum, standard deviation, skewness and kurtosis. Mean is a measure of central tendency, a calculated 'central' value of a set of numbers. Standard deviation shows just how spread out numbers are. A large standard deviation can be an indicator of just how poor an estimator of population mean the sample mean is. Skewness measures asymmetry of a statistical distribution and refers to the extent to which a distribution differs from a normal distribution. Kurtosis on the other hand measures whether data are heavy-tailed or light-tailed with reference to a normal distribution.

Table 4.1: Descriptive Statistics

Variable	Y	RuP	Inc	Une	Int
Mean	0.16024	0.8077	0.0256	0.0421	0.0792
Std. Dev.	0.0709	0.0680	0.0279	0.0362	0.0754
Min	0.0409	0.6768	-0.0682	0.0078	-0.1668
Max	0.3419	0.9175	0.1045	0.1217	0.2300
Skewness	0.7779	-0.0236	-0.4624	1.2811	-0.5117
Kurtosis	-0.0191	-1.2345	1.2848	0.0223	0.5926
Obs	85	85	85	85	85

This study considered five countries whose variables were studied over 17 years -2000-2016 making a total of 85 observations. The summary of their characteristics are as presented in Table 4.1. The data shows that the average interest rate is 7.9% though the minimum value for this is -16.7% showing a possibility of losing money on investments/ savings made. The study adopted real interest rates as a proxy for interest rates. Real interest rate is the lending rate adjusted for inflation. Should inflation rate be higher than the lending rate, then the real interest rate is negative. Unemployment rates in the region are at an average of 4.2% though the highest recorded rate over the period was 12.17%.

Table 4.2: Table of overall, within and between statistics

Variable		Mean	Std. Dev	Min	Max	Observations
Y	Overall	0.16024	0.070924	0.0409	0.3419	N=85
	Between		0.069988	0.103382	0.276565	n=5
	Within		0.032633	0.097758	0.226934	T=17
RuP	Overall	0.807666	0.067965	0.6768	0.9175	N=85
	Between		0.069016	0.730624	0.898129	n=5
	Within		0.027628	0.731831	0.880231	T=17
Inc	Overall	0.025552	0.02794	-0.06818	0.104499	N=85
	Between		0.02038	-0.00393	0.050869	n=5

	Within		0.021081	-0.0387	0.079182	T=17
Une	Overall	0.042114	0.036242	0.077	0.1217	N=85
	Between		0.039433	0.016206	0.111288	n=5
	Within		0.007396	0.028197	0.057997	T=17
Int	Overall	0.079167	0.075378	-0.1668	0.23	N=85
	Between		0.034803	0.037277	0.028959	n=5
	Within		0.068566	-0.14729	0.224391	T=17

Table 4.2 presents the summary overall, between and within statistics of the variables under study. The overall statistics are based on the 85 observations which means that they study variation over time and individuals and are as explained in the output for Table 4.1. The between statistics are based on the summary statistics of the 5 countries disregarding the time period – they are time invariant. For the between statistics, the mean (for every variable observation) is calculated for each country to provide an indicative variable value. Therefore, the least rural population recorded among the countries was 73.1% with the highest being 89.8%. This shows quite a distinct range when assessing poverty levels for the region. The highest unemployment rate and interest among the countries was 11.1% and 12.9% respectively with lowest values reported for this variables being 1.62% and 3.73% respectively. This again shows the differences between characteristics of countries in the region covered under this study. The reported between variance is a measure of this calculated mean per country and the overall mean.

The within statistics are an observation across the 17 time periods regardless of the country. The variable value is calculated as $x_{it} - \bar{x}_i + \bar{\bar{x}}$. The overall mean is added back to make the results comparable. Therefore, for this study, over the 17 year period under study, the lowest interest rate was -14.7% with the highest interest rate calculated as 22.4%. For income growth, the highest was 7.9% with the least as -3.87%.

For income, the between and within standard deviations are nearly the same. This indicates that variation in income across the countries is nearly equal to the one observed within a country over time. If you were to randomly select two countries from the five, the difference in income should be nearly equal to the difference in for the same country in two randomly selected years.

4.3 Exploratory Data Analysis

Before fitting any models, the author sought to heavily visually explore the data in order to understand underlying structure and test any underlying assumptions in the data such as stationarity and correlation.

4.3.1 Dependent Variable Visual Plots

Exploration of the dependent variable was undertaken as a within firm (country) and between firm (country) analysis. Figures 4.1 and 4.2 plot the behaviour of credit issued by financial institutions as a proportion of GDP over the 17 years across the 5 countries. The within firm growth plots are useful in pre-determining if there could be time related fixed effects in the observations. The overlain plot in Figure 4.2 helps explain if there are significant differences between the countries and if they have different y intercepts. Different intercepts, such as exhibited in the figure is an indicator of the existence of fixed effects. This is however conclusively confirmed with the diagnostic tests.

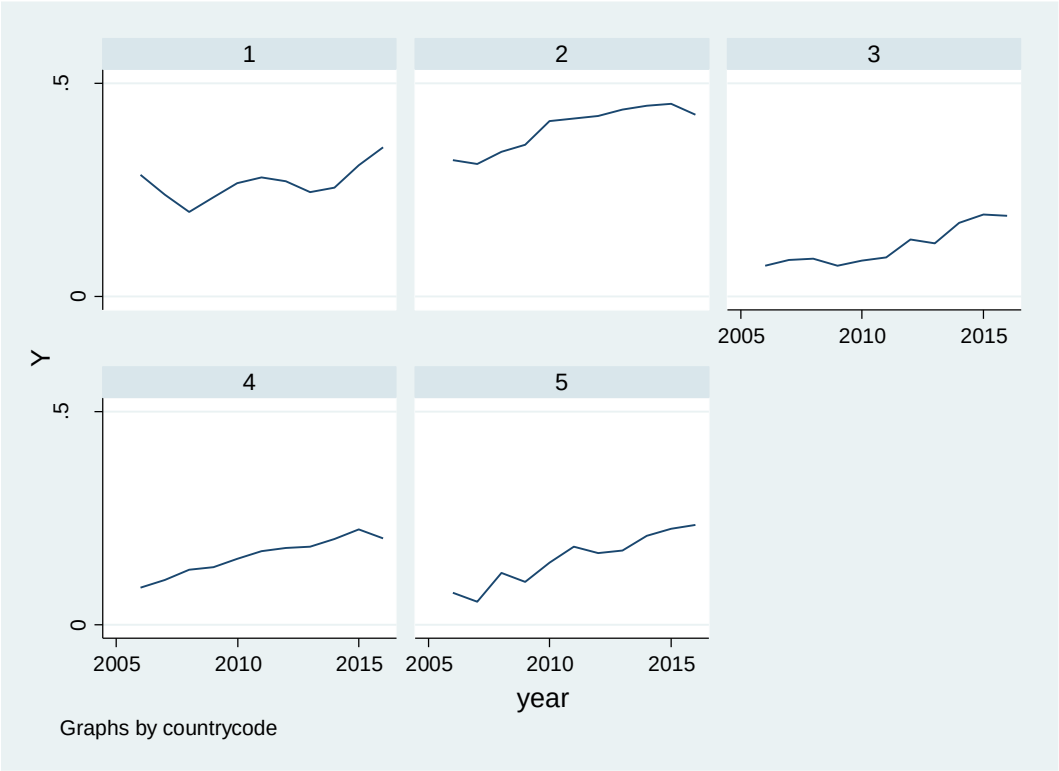

Figure 4.1: Individual trend lines for dependent variable

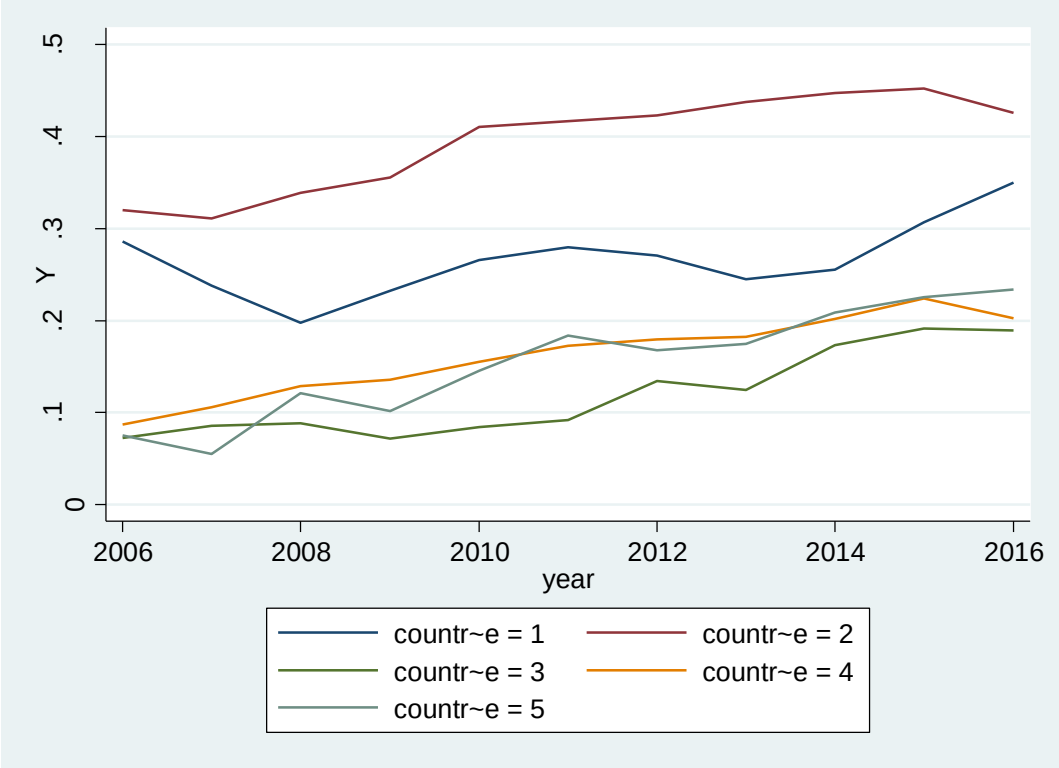

Figure 4.2: Overlain plot for dependent variable

4.3.2 Multicollinearity Test

The multicollinearity test is an evaluation of whether independent variables are linearly correlated. Correlation analysis provides a value that shows whether changes in the dependent variable are caused by changes in the independent variable. The correlation coefficient then measures the linear association between two variables (Crossman 2013). Correlation coefficients are numerical values indicating the direction of and strength of a relationship between two variables. If equal to 1, there is a strong and positive relationship; if 0, there is no relationship; and if -1, there is a strong, negative relationship. Where two or more independent variables in a model are highly correlated, >0.8, the estimated regression coefficients are both unreliable and unstable. Overall the results that are obtained are strange and cannot be used to study the impact of the independent variables on the dependent variable.

Table 4.3: Correlation Matrix at 5% significance

	Y	**RuP**	**Inc**	**Une**	**Int**
Y	1.0000				
RuP	-0.1978	1.0000			
Inc	-0.2123	-0.3925	1.0000		
Une	0.7260	-0.3497	-0.0683	1.0000	
Int	-0.0437	-0.0194	0.1865	-0.0426	1.0000

None of the independent variables are highly correlated i.e. none of them have a correlation coefficient greater than 0.8 as is shown in Table 4.3. . Unemployment is the only independent variable that is positively correlated with the dependent variable with a correlation value of 0.7260. Rural population, income and interest rates all exhibit a negative correlation with financial inclusion with correlation coefficients of -0.1978, -0.2123 and -0.0437 respectively. This implies that an increase in a nation's income level, rural population size or

interest rates will lead to a decrease in credit advanced by the financial institutions to the private sector i.e. an increase in those variables reduces financial inclusion.

Table 4.4: Collinearity Diagnostics Table

Variable	VIF	SQRT VIF	Tolerance	R-Squared
Y	2.24	1.50	0.4458	0.5542
RuP	1.43	1.19	0.7012	0.2988
Inc	1.37	1.17	0.7312	0.2688
Une	2.33	1.53	0.4284	0.5716
Int	1.04	1.02	0.9610	0.0390
Mean VIF	1.68			

To further preclude multicollinearity, a collinearity test was undertaken. The VIF (Variance Inflation Factor) measures how much the variance of an estimated regression coefficient increases if independent variables are correlated. A high VIF is an indicator of increased correlation. Should the mean VIF of the variables being studied be greater than 5, then the variable with the highest VIF is dropped. The collinearity test revealed that the mean VIF was 1.68 which is less than 5 and as such, there was no need to drop any variable. The VIF values of 2.24, 1.43, 1.37, 2.33 and 1.04 as indicated in Table 4.4 are within acceptable parameters.

4.3.3 Test for Stationarity

The study carried out a panel unit root test on all variables to preclude instance of spurious (non-sense) regression due to lack of stationarity. The Levin-Lin-Chu unit root test was adopted for this study. The Levin-Lin-Chu test was adopted as it does not allow for the possibility of the variable of a country to contain unit roots whereas for another country the same variable contains unit roots (Levin, Lin & Chu,2002).

The problem in panels is that they are rarely independent of one another. For instance, affairs in Kenya affect what happens in Uganda and Tanzania. To further compound this, all these countries are members of the East African Community. This is referred to as cross-sectional interdependence, a phenomenon familiar in the social sciences since the1930s

(Sarafidis & Wansbeek, 2010). This is often ignored but could lead to issues in panel unit root testing. Demeaning the panels per time unit reduces these issues. If p-value<0.05, reject Ho and thus panels are stationary. The p values for all the variables ranged between 0.0000 and 0.0119. This value is less than 0.05, therefore the null hypothesis that states that all panels contain unit roots was rejected. All variables are stationary and can be used in a model without the need to use first differences. The test results are as shown in Table 4.5.

Table 4.5: Stationarity Table using Levin-Lin-Chu unit-root test

	Ho: Panels contain unit roots Ha: Panels are stationary	
	Level	
Variable	**Test Statistic**	**p-value**
Y	-3.2147	0.0007
RuP	-8.5169	0.0000
Inc	-3.1856	0.0007
Une	-2.2601	0.0119
Int	-3.7434	0.0001

4.4 Diagnostic Tests

This part describes the diagnostic/specifications tests that were carried out to check the appropriate model to use. As the study has panel data, the models available for use are either Pooled Ordinary Least Squares or Panel Data models which are Fixed Effect model or Random Effect model. A fixed effects model allows for associations to exist between unobserved variables and the observed variables. These models control for the effects of time-invariant variables with time invariant effects. The key assumption under this model is that there are unique characteristics of the panels that do not vary over time. A random effects model on the other hand assumes that the unobserved variables are uncorrelated with all the observed variables. Random effects model allows for the estimation for time invariant variables. A pooled OLS can be used to derive unbiased estimates of parameters even where time constant attributes are present. POLS is an OLS technique run on panel data. Table 4.6 shows the results of the fitted models.

Table 4.6: Results of fitting the Fixed Effects, Random Effects and POLS models

Independent Variables	Fixed Effects	Random Effects	POLS
Constant	0.9218*** (0.0000)	0.1270 (0.116)	0.1270 (0.120)
RuP	-0.9412*** (0.000)	-0.0189 (0.839)	-0.0189 (0.839)
Inc	0.0896 (0.406)	-0.4429* (0.040)	1.3866* (0.044)
Une	-1.3501 (0.669)	1.3867*** (0.000)	2.9586*** (0.000)
Int	0.0237 (0.482)	0.0176 (0.806)	0.0176 (0.807)
R^2	0.9255		0.5608
P	0.0000***	0.0000	1.75e-08***
Sum squared resid	0.0315		0.2973
S.D. dependent var	0.0709		0.1120
S.E. of regression	0.0203		0.0771
*Where *, ** and *** represent 0.05, 0.01 and 0.001 levels of significance respectively*			

4.4.1 The Hausman Test

The choice between random effects and fixed effects model is moderated by the use of the Hausman test (Hausman, 1978). It basically tests whether the models' unique errors are correlated with the regressors, the null hypothesis is that they are not. This means that the random model is compared against the fixed model. Should the null hypothesis fail to be rejected, then the random effect model is favoured. The Hausman test examines whether the 'random effects estimate is insignificantly different form the unbiased fixed effect estimate' (Kennedy, 2008 p.286). It uses the 'covariance of an efficient estimator with its difference from an inefficient estimator is zero" (Greene, 2008 p.208). This test statistic follows the chi-squared.

If the Prob>chi2 is less than 0.05, the null hypothesis is rejected and we conclude that the difference in coefficients is systematic. For this study, the value of prob>chi2 was 0.0000 which is less than 0.05, the null hypothesis was rejected. These results are as presented in Table 4.7. The study concluded that the fixed effect model was favoured.

Table 4.7: Results of the Hausman Test to choose between the Fixed and the Random Effects models

Test Statistic-chi2(4)	Prob>chi2
1598292.55	0.0000

4.4.2 Choosing between Pooled Ordinary Least Squares and the Fixed Effects Model

The Modified Chow test is used to choose between the Fixed Effects and POLS model. The chow test really tests if the slopes of the independent variables are the same across countries or over time periods (years). This is referred to as an examination of poolability (Chow, 1960). If the null hypothesis of poolability is rejected, then countries may have their own slopes for the independent variables.

For the poolability test, it is necessary to run country by country OLS regressions and also one pooled OLS regression for comparison. The null hypothesis is that all slopes of the independent variables are the same across countries.

$$H_{01}: \beta_{ik} = \beta_k \; for \; 1 \ldots \; ith \; country \; and \; 1 \ldots kth \; independent \; variable$$

$$H_{01a}: \beta_{ik} \neq \beta_k \; for \; at \; least \; one \; 1 \ldots \; ith \; country \; and \; 1 \ldots kth \; independent \; variable$$

The test is conducted by calculating the F statistic as follows:

$$F_c[(n-1)(k+1), n(T-k-1)] =$$

$$\frac{(SSE_{pooled\ OLS} + SSE_{sum\ of\ SSEs\ of\ country\ by\ country\ regression})/(n-1)(k+1)}{SSE_{sum\ of\ SSEs\ of\ country\ by\ country\ regression}/n(T-k-1)} \qquad 4.1$$

Where n are the number of countries

K is the number of independent variables

T is the number of observations per country (equivalent to number of years under study)

The fitted OLS model results are as shown in Table 4.8. The values as obtained were then used in calculating the F statistic.

Table 4.8: Results of fitting the POLS

Y	**SS Model**	**Residual SS**	**Total SS**
Full Model	0.2342	0.1883	0.4225
Country 1	0.0021	0.0045	0.0066
Country 2	0.0180	0.0039	0.0220
Country 3	0.0242	0.0023	0.0265
Country 4	0.0165	0.0012	0.0177
Country 5	0.0160	0.0007	0.0167

Calculation of the F statistic is as follows:

$$F_c[(n-1)(k+1), n(T-k-1)] =$$

$$\frac{(SSE_{pooled\ OLS} + SSE_{sum\ of\ SSEs\ of\ country\ by\ country\ regression})/(n-1)(k+1)}{SSE_{sum\ of\ SSEs\ of\ country\ by\ country\ regression}/n(T-k-1)} \quad 4.2$$

Where n=5,k=4,T=17

$$F_c[(5-1)(4+1), 5(17-4-1)] = \frac{((0.1883-(0.0045+0.0039+0.0023+0.0012+0.0007)/(5-1)(4+1)}{0.0045+0.0039+0.0023+0.0012+0.0007/5(17-4-1)}$$

4.3

$$F_c[20,60] = \frac{(0.1883-0.0126)/20}{0.0126/60} \quad 4.4$$

$$F_c[20,60] = \frac{(0.1919)/20}{0.0126/60}$$

4.5

$$F_c[20,60] = \frac{0.0096}{0.0002} \quad 4.6$$

$$F_c[20,60] = 45.6940 \quad 4.7$$

$$F_{T(0.05)}[20,60] = 1.748 \quad 4.8$$

Therefore

$$F_c[20,60] > F_{T(0.05)}[20,60]$$

The test is such that if the calculated F value is greater than the F test table value, the null hypothesis is rejected, and if the calculated F value is less than the F test table value, the study fails to reject the null hypothesis.

Based on the results, the calculated F test value was 45.6940 against a table value of 1.748. The null hypothesis was rejected. The study could not adopt POLS to fit the model as this would imply that the five countries under study did not have different slopes for the independent variables. The model to be used was therefore selected as the fixed effects model.

4.4.3 Testing for Fixed Time Effects

As per the diagnostic tests, the model to be fitted was the fixed effects model. The model was fitted with dummy variables for the years to test whether fixed time effects needed to be accounted for in the final model.

A test was then carried out testing the following hypothesis:

$$H_{02}: All\ time\ effects = 0$$

$$H_{02a}: At\ least\ one\ time\ effect\ \neq 0$$

The test was carried out under the assumption that there were no time effects that would warrant the introduction of dummy variables for the years 2000-2016 (less one). The results were:

$$F(16,60) = 0.97$$

$$Prob > F = 0.5042$$

Prob.F was less than 0.05 and the study failed to reject the null hypothesis. As such, there were no time related fixed effects. There was no need to fit dummy time variables.

4.4.4 Heteroscedasticity Test

Homoscedasticity is an assumption that states that for the fitted model, the probability distribution is the same for all observations. Should the disturbance terms not have the same variance, this is referred to as heteroscedasticity (Garson, 2012). In order to detect any heteroscedasticity, the Modified Wald test for group wise heteroscedasticity (Greene, 2000) in fixed regression model was used.

$$H_{03} = {\sigma_i}^2 = \sigma^2 \; for \; all \; i$$

$$H_{03a} = {\sigma_i}^2 \neq \sigma^2 \; for \; at \; least \; one \; i$$

The test shows that the p-value, p<0.05 which made it significant. The null hypothesis was not accepted and as such the model had a heteroscedasticity problem. This is as evidenced in Table 4.9. This was corrected by applying robust standard errors when fitting the model (Stock & Watson, 2008). The final model was reported with these errors instead.

Table 4.9: Results of the Modified Wald Test for heteroscedasticity

Test Statistic-chi2(5)	**Prob>chi2**
89.20	0.0000

4.4.5 Normality Tests

Normality tests were applied to the residuals of the fitted model and reported in graphic terms. The Figures 4.3, 4.4 and 4.5 below display the P-P plot, Q-Q plot and histogram of residuals of the fitted model respectively. Figure 4.3 presents the P-P plot of the residuals and as there were no observations with significant deviations from the 45 degree line cutting through the graph , the residuals were approximately normal. The Q-Q plot as shown in Figure 4.4 has the observations almost at 45 degrees straight line which is an indicator that residuals were approximately normal. The symmetric bell-shaped histogram of residuals as indicated by Figure 4.5 is an indicator that variance is normally distributed and thus normality assumption of regression held true.

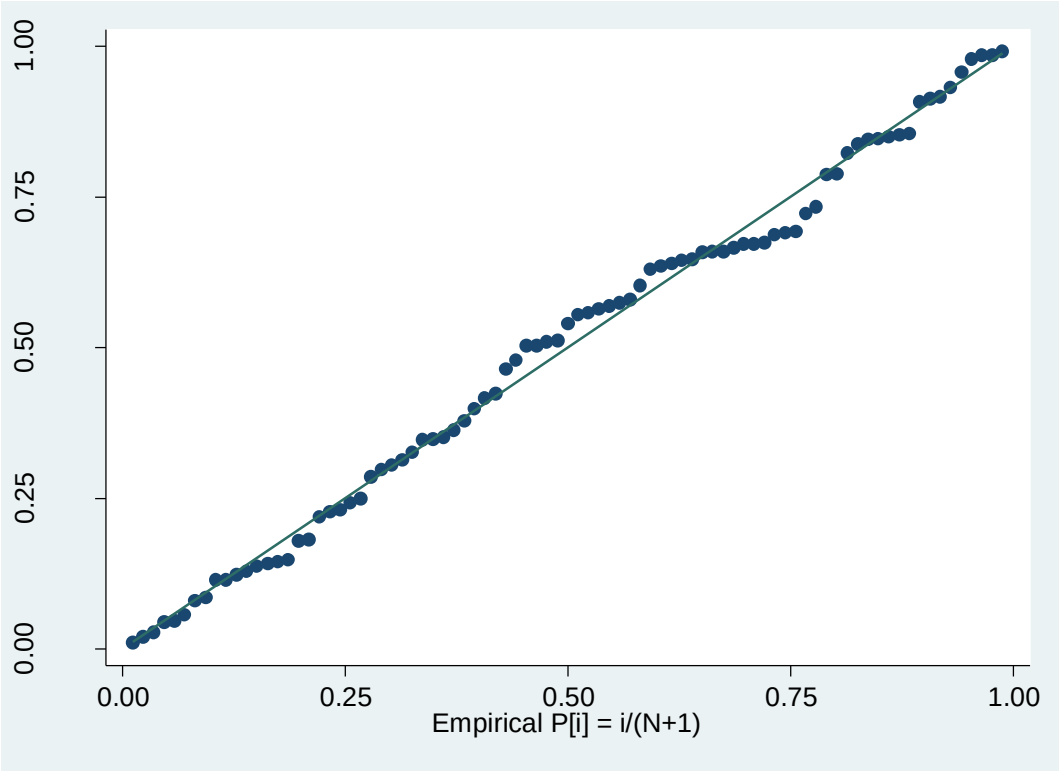

Figure 4.3: P-P plot of residuals

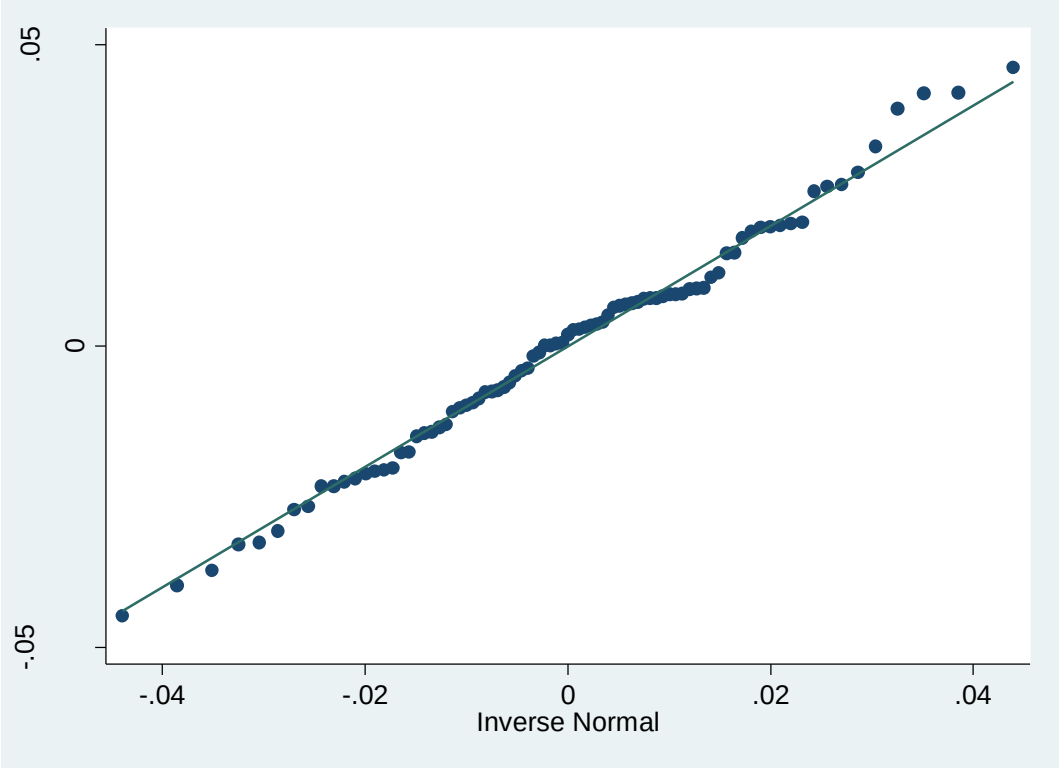

Figure 4.4: Q-Q plot of residuals

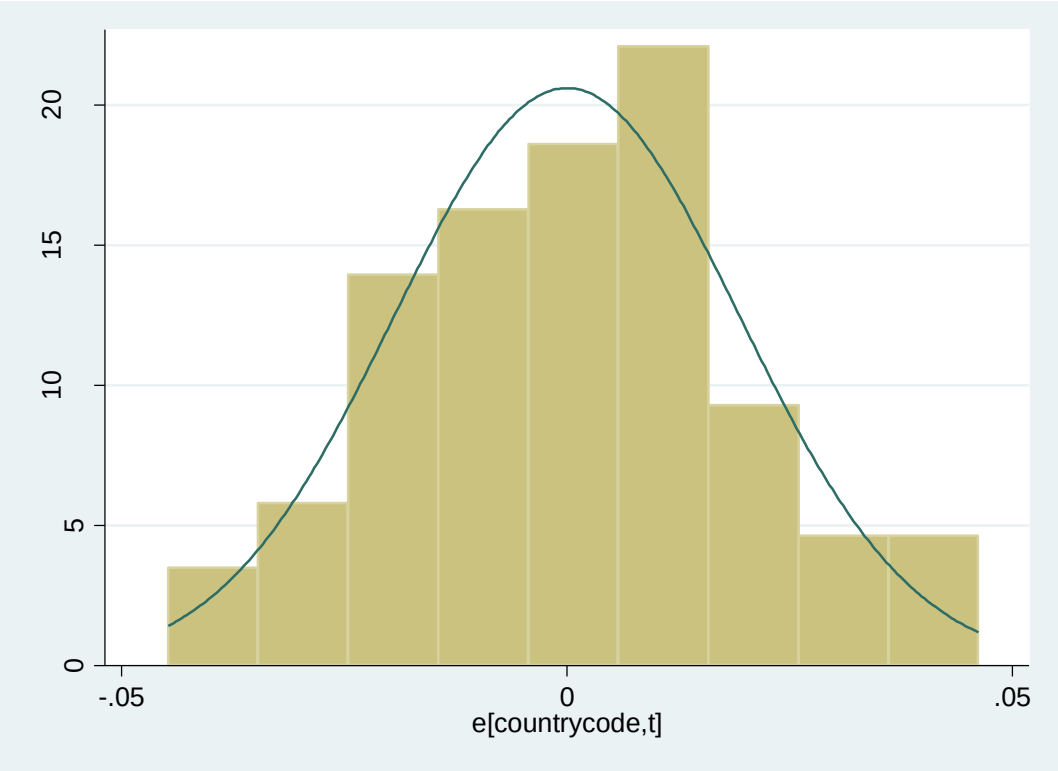

Figure 4.5: Histogram of residuals

4.5 Model Fitting

The study aimed to fit the fixed effects model presented below:

$$Y_{i,t} = \beta_0 + \beta_1 RuP_{1i,t} + \beta_2 Inc_{2i,t} + \beta_3 Une_{3i,t} + \beta_4 Int_{4i,t} + \alpha_i + \varepsilon_{i,t} \quad 4.9$$

Where

Y: Domestic credit to private sector by banks (as a % of GDP)

RuP: Rural Population

Inc: GDP per capita

Une: Unemployment rate

Int: Real Interest rates α_i is treated as a random variable with a specified probability distribution in case of a set of fixed parameters in fixed effects model

ε_{ij} is the disturbance term following a normal distribution

The study ran the overall analysis to determine the significance of the determinants of financial inclusion under study. The determinants were rural population, unemployment rates, income

and interest rates as expressed above. The results of fitting the model with robust standard errors to control for heteroscedasticity are as shown in Table 4.10.

Table 4.10: Final model results

Fixed-effects, using 85 observations Included 5 cross-sectional units Time-series length = 17 Dependent variable: Y Robust (HAC) standard errors				
	Coefficient	Std. Error	t-ratio	p-value
Constant	0.9220***	0.0918	10.04	0.001
RuP	-0.9412**	0.1358	-6.93	0.002
Inc	0.0896*	0.0262	3.42	0.027
Une	-0.1350	0.4747	-0.28	0.790
Int	0.0237	0.0369	0.64	0.556
Mean dependent var 0.160241 Sum squared resid 0.031464 rho 0.692040			S.D. dependent var 0.070924 S.E. of regression 0.020347 Within R-squared 0.648151	
Joint test on named regressors - Test statistic: F(4, 4) = 94380.5 with p-value = P(F(4, 4) > 94380.5) = 0.0000				

4.5.1 Effect of Rural Population on Financial Inclusion

Results of fitting the model test the hypothesis that rural population size of a country has no effect on financial inclusion. This is tested by assuming that the coefficient for rural population is equivalent to zero.

$$H_{04}: \beta_1 = 0$$

$$H_{04a}: \beta_1 \neq 0$$

The p value for the coefficient denoting rural population was 0.001 which is less than 0.5. The null hypothesis was rejected meaning that rural population is a significant variable at 99%. The results of the regression thus indicate that rural population has a negative and significant relationship on financial inclusion. This negative relationship implies that financial inclusion levels decrease as one approaches the rural regions in a country, in this case by 94.12% per every unit increment in rural population. The findings on rural population are

consistent with findings by Yorulmaz (2016) and Kempson and Whyley (2001) who found rural population size of a country to have a negative relationship with financial inclusion.

4.5.2 Effect of Income levels on Financial Inclusion

Results of fitting the model test the hypothesis that income level has no effect on financial inclusion. This is tested by assuming that the coefficient for income is equivalent to zero.

$$H_{05}: \beta_2 = 0$$

$$H_{05a}: \beta_2 \neq 0$$

The p value for the coefficient denoting income was 0.002 which is less than 0.5. The null hypothesis was rejected meaning that income is a significant variable at 95% .The income variable has an expected sign with a significant relationship with financial inclusion. As income grows, whose proxy is growth in GDP per capita, it is expected that financial inclusion shall increase. For this study, a unit increase in growth rate of GDP per capita led to an increase of 8.96% in financial inclusion. This is consistent with findings by Sarma and Pais (2008), Yorulmaz (2016) and Weill and Zins (2016). These past studies showed a positive relationship between income and financial inclusion.

4.5.3 Effect of Unemployment on Financial Inclusion

Results of fitting the model test the hypothesis that unemployment levels have no effect on financial inclusion. This is tested by assuming that the coefficient for unemployment is equivalent to zero.

$$H_{06}: \beta_3 = 0$$

$$H_{06a}: \beta_3 \neq 0$$

The p value for the coefficient denoting rural population was 0.79 which is greater than 0.5. The study failed to reject the null hypothesis meaning that unemployment is not a significant variable i.e. had no effect on financial inclusion for this study. Unemployment rate had an expected negative sign, indicating that as national levels of unemployment rise, financial

inclusion levels reduce. The variable is however insignificant in explaining the levels of financial inclusion.. These findings are consistent with findings by Sarma and Pais (2008) and Yorulmaz (2016) who found unemployment negatively but statistically significant in relation to financial inclusion.

4.5.4 Effect of Interest Rates on Financial Inclusion

Results of fitting the model test the hypothesis that interest rates have no effect on financial inclusion. This is tested by assuming that the coefficient for interest rates is equivalent to zero.

$$H_{07}: \beta_4 = 0$$

$$H_{07a}: \beta_4 \neq 0$$

The p value for the coefficient denoting interest rates was 0.556 which is greater than 0.5. The study failed to reject the null hypothesis meaning that interest rates are not a significant variable i.e. had no effect on financial inclusion for this study. Interest rates had a positive relationship with financial inclusion. With an increase in interest rates in a country, the level of financial inclusion also increases. These findings are partially consistent with Sarma and Pais (2008) and Olaniyi and Babatunde (2016) who found a positive relationship between interest rates and financial inclusion.

Following the analysis in this chapter, the model fitted based on significant variables was as follows:

$$Y = 0.9220 - 0.9412RuP + 0.0896Inc \qquad 4.10$$

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This study gave evidentiary proof in line with the objective of the study which was to determine the determinants of financial inclusion in East Africa. More precisely, the study aimed to ascertain the effect of unemployment rates, income, rural population and interest rates on financial inclusion in East Africa. This chapter provides a summary of the findings arrived at after addressing the research questions as outlined in chapter one. Conclusions are then derived for each of the research question. Based on these and research limitations of the study, recommendations for policy and for future research are also made.

5.2 Summary of Findings

The study was focused on the determinants of financial inclusion in East Africa, a study which has not been previously undertaken. The analysis was performed using panel data drawn from 5 countries- Kenya, Uganda, Tanzania, Burundi and Rwanda over 17 years, 2000-2016. A fixed effects model was finally fitted with data revealing findings consistent with previous studies on the determinants of financial inclusion.

5.2.1 Effect of Rural Population on Financial Inclusion

The study sought to examine the effect of rural population size on financial inclusion. Investigations into the same revealed a positive and significant relationship. Holding all other factors constant, the study determined that for each unit increase in rural population, financial inclusion in a country reduces. The influence and significance was as indicated by the p value which refutes the null hypothesis that states that rural population has minimal or no effect on financial inclusion. What the findings reveal is that as a country has a higher rural population, its financial inclusion reduces. Also, as one goes into the rural parts of a country, financial inclusion levels reduce. This observation is not far-fetched from the reality in East Africa.

Uptake of the use of financial institutions is lower in the rural areas. This finding is also consistent with findings by Yorulmaz (2016) in his study of European nations and Kempson and Whyley (2001) in a worldwide study of factors influencing financial inclusion efforts.

5.2.2 Effect of Income on Financial Inclusion

Another objective of the study was the effect of income levels on financial inclusion. The investigation into this revealed income to have a positive and significant relationship with financial inclusion. The influence and significance was as indicated by the p value which refutes the null hypothesis that states that income has minimal or no effect on financial inclusion. The study found that for each unit increase in growth rate of GDP per capita, financial inclusion increased. This can easily be translated to mean that high income levels at both local and national level translate to high levels of financial inclusion or that with an increase in income, there is increase in financial inclusion of a nation. Sarma and Pais (2008) in their study of factors influencing financial inclusion in India concluded that income levels play a major role in financial inclusion efforts. These findings were supported by Yorulmaz (2016) in his study of the European Nations and Weill and Zins (2016).

5.2.3 Effect of Unemployment Rate on Financial Inclusion

The study into unemployment rate and its relationship with financial inclusion revealed a negative and insignificant relationship. This was as indicated by the p value which supports the null hypothesis that unemployment rate has minimal or no effect on financial inclusion. A country which experiences increase in the percentage of its population that is unemployed shall see a reduction in financial inclusion. At an individual level, if one is unemployed, they are less likely to participate in the banking sector of the country, depositing or borrowing from the formal financial institutions. Sarma and Pais (2008) found a negative relationship between financial inclusion and unemployment rate in states of India Yorulmaz (2016) also came to a

similar conclusion in his study of Europe though both studies referred to found unemployment to be a significant variable.

5.2.4 Effect of Interest Rates on Financial Inclusion

The final objective of the study was to determine how interest rates influence financial inclusion. The output indicated that interest rates have a positive though insignificant relationship with financial inclusion. The influence and significance was as indicated by the p value which supports the null hypothesis that states that interest rates have minimal or no effect on financial inclusion. This indicates that interest rate can serve as an incentive for people to save and borrow from banks. Olaniyi and Babatunde (2016) and Sarma and Pais (2008) had similar results in their study of African countries and Indian states respectively. For both studies, interest rate was a not a significant determinant of financial inclusion.

5.3 Conclusion

Supported by findings of this study as is documented in chapter four, a number of logical conclusions was drawn. Rural population and income are the two significant determinants of financial inclusion in East Africa. Consistent with the results, it is expected that with an increase in the rural population of a country, there is bound to be a decrease in financial inclusion levels of a country. Countries with increased GDP per capita will have more inclusive financial systems thus have higher levels of financial inclusion. This is consistent with findings by earlier researchers.

In East Africa however, unemployment rates and interest rates are not significant determinants of financial inclusion. Unemployment rates are negatively related to financial inclusion and an increase in unemployment rates in East African countries will lead to a reduction in financial inclusion levels. It is agreed that this would be an expected outcome for this variable. The study also concludes that interest rates though insignificant have a positive influence on financial inclusion.

5.4 Recommendations

The findings of this study are important to policy makers, banking sector specialists and advisors to banks. Rural population as a determinant of financial inclusion points to the need for expansion of financial services to the rural areas or urbanising more parts of a country through provision of infrastructure. Financial literacy in the rural areas can help in the campaign for financial inclusion. Based on the demographics of the rural population as well, the financial literacy campaigns can also be more targeted e.g. on women, specific religious communities or even a specific age group. Further, alternative approaches to availing banking infrastructure can be considered, such as agency banking. The population living in the rural areas also suffer from financial handicaps especially considering the seasonality of their income and any migration that is brought about by job seeking. To temper this, banking products need to be tailored to address the varying needs of the rural population.

Interest rate though an insignificant determinant of financial inclusion can also be used as an effective policy tool. Should citizens receive a good enough incentive to save money with financial institutions, there can then be higher deposits with the institutions. Should interest rates be reduced, more citizens would be willing to approach financial institutions for credit advancement.

5.5 Recommendations for Future Research

The study sought to establish the determinants of financial inclusion in East Africa. Future research should consider using a more robust measure of financial inclusion that captures the different aspects of financial inclusion. The current study only adopted usage dimension of financial inclusion and ignored dimensions such as accessibility/ penetration of services, availability of services and quality of products. It would be advisable to also consider other variables that are considered determinants of Financial Inclusion such as gender and religion.

Further, the study can be expanded to more countries within the East African geographical region.

5.6 Research Limitations

In conducting this study, a literature gap was identified as pertains determinants of financial inclusion in East Africa. The study adopted the usage of banking services as a measure of financial inclusion. Usage is only one dimension of financial inclusion. The study was also limited to the study of only four variables. The use of historical data, though cheaper to obtain, presents a challenge in examining current state of financial inclusion.

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APPENDICES

APPENDIX I: DATA COLLECTION SHEET

Data Collection Sheet					
Country:					
Year	Domestic credit to private sector by banks (% of GDP)	GDP per capita	Unemployment Rate	Rural Population	Interest Rate
1999					
2000					
2001					
2002					
2003					
2004					
2005					
2006					
2007					
2008					
2009					
2010					
2011					
2012					
2013					
2014					
2015					
2016					