INEQUALITY OF OPPORTUNITY IN FINANCIAL INCLUSION IN KENYA: THE GENDER PERSPECTIVE

BY

ANNA MUTHINI MUEMA

X51/6533/2017

A RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF THE MASTERS OF ARTS IN ECONOMIC POLICY MANAGEMENT

2019

DECLARATION

I, **Anna Muthini Muema**, hereby declare that this project is my original work and has not been submitted for any degree in any other University or any other award.

Signature: …… Date: ……

Anna Muthini Muema Reg. No. X51/6533/2017

SUPERVISOR'S DECLARATION

This project has been submitted with my approval as the University supervisor.

Signature: …… Date: ……

Dr. Elizabeth Owiti Ph.D.

ACKNOWLEDGEMENTS

I would like express gratitude to my supervisor Dr. Elizabeth Owiti for the unending support and commitment to nurture me throughout the paper.

I am thankful to my fellow group members for the pooled social capital and encouragement throughout this journey. To my friends and family, I say thank you for the time you took to encourage me as it's been a source of strength especially my mother Tabitha Nzula Muema who has been relentless to ensure this is a success. I'd also like to thank my late father David Muema Iseka, Tata I have made you proud.

Finally, I thank God for his grace.

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LIST OF ACRONYMS

FI	Financial Inclusion
UNCDF	United Nations Capital Development Fund
IMF	International Monetary Fund
CBK	Central Bank of Kenya
KNBS	Kenya National Bureau of Statistics
FSDK	Financial Sector Deepening Kenya
GPFI	Global Partnership for Financial Inclusion
CGAP	Consultative Group to Assist the Poor
IFC	International Finance Corporation
EBRD	European Bank for Reconstruction and Development
GDP	Gross Domestic Product
ICT	Information and Communication Technology
AFI	Alliance for Financial Inclusion
HOI	Human Opportunity Index
IOP	Inequality of Opportunity
ATMs	Automated Teller Machines
PCA	Principal Component Analysis

ABSTRACT

Equitable opportunity to the access of financial services to all is paramount in ensuring social inequalities and injustices do not act as barriers to enhancing financial inclusion. This paper investigates how inequalities in financial inclusion influences gender inequalities and the circumstances that drive inequality of opportunity. The United Nations Capital Development Fund (UNCDF) identified financial inclusion as a major promoter of various Sustainable Development Goals and can be used as a tool to alleviate poverty and promote inclusive economic growth. In Kenya, tremendous progress has been seen in financial inclusion with the number of individuals who are reported to be financially included growing from 75.3% in 2016 to 82.9% as of 2018 according to the 2019 Fin Access Household Survey report. Although a reduction in unequal distribution in gender, income and wealth gaps has been registered, women's use of formal financial services is still low, hence the need to shift focus from access of financial services to inequality of opportunity that defines inclusivity.

The National Fin Access household data survey for 2018 was used to measure financial inclusion through a multidimensional index and the Human Opportunity Index (HOI) is used to measure inequalities that affect the delivery and consumption of financial services using the principle of equality of opportunity. This research employs the human opportunity index due to its capability to systematically examine existing policies and identify inequalities that ought to be addressed. Universally used indicators of financial inclusion which are; country characteristics (quality and legal frameworks that govern financial institutions, cost of opening bank accounts, political stability, and the element of trust) and individual characteristics (level of education, gender, employment status and residential area) provide solely the coverage level of financial services but does not demonstrate the differential intensity across different subclasses or subgroups, therefore, the human opportunity index measures the inequality in the apportionment of rudimentary services. In order to quantify the contribution of each circumstance variable, the Shapley decomposition method was adopted. In conclusion, the analysis shows the purpose of measuring inequality of opportunity in financial inclusion and provides vital insights to policy makers on policies that reward those who experience inequalities due to effort and compensate those who experience inequalities due to circumstances.

CHAPTER ONE: INTRODUCTION

1.1 BACKGROUND

Financial inclusion (FI) is a major global concern in financial and economic discourse consequently it is a vital policy priority in the agenda of governments across the world. To avert regressive development outcomes in many developing countries, there is need to shift focus from the access of basic services to the inequalities that determine inclusiveness. The growth of the financial sector and enactment of favorable social policies is key in promoting financial inclusivity.

There is generally no conventional description of Financial Inclusion given its multidimensional nature and varying approaches to its jurisdictions (Tita and Aziakpono, 2017). According to Sarma and Pais, (2011) it is the process of providing a variety of financial services through the banking sector outreach, at reasonable price, at the right location, time and form and without any discernment to any member of the society. Additionally, according to the World Bank (2018) it is outlined as persons and organizations having access to suitable and reasonably priced formal financial services which solve their needs and are distributed in an accountable and sustainable manner.

The availability of financial access points and usage of formal financial services does not essentially illustrate that the financial systems are inclusive hence this is not a comprehensive measure of inclusiveness but rather the output of financial inclusion. Therefore, in broader terms, financial inclusion can also be outlined as access and maximization in utilization of various financial services among vulnerable communities in a society while minimizing involuntary financial exclusion (Camara and Tuesta, 2014).

Financial inclusion is measured through formal account ownership, ability to access formal savings, insurance and credit facilities. According to World Bank (2018), the first key step in the direction of financial inclusion is access to a transaction account (bank account). This facilitates activities within the scope of using financial services which include payment of services, savings, credit and insurance. According to Global Findex, (2014), an estimated 2 billion adult's lack access

to transaction accounts therefore are left out from the formal and recognized or mainstream financial systems.

On the other hand, financial exclusion can be categorized into two categories, that is, voluntary and involuntary financial exclusion. Firstly, voluntary financial exclusion is whereby people can access financial services nevertheless they are unwilling to use them due to personal choice motivated by cultural beliefs, religious orientation among others. Self-exclusion could also be as a result of lack of cognizance of the readily available financial services and the benefits that services offer, whereas involuntary financial exclusion is whereby people lack access to formal financial systems as a result of inclusion barriers that undermine social exclusion. Some of the issues that contribute to involuntary financial inclusion include lack of collateral to acquire credit, service affordability, the geospatial differences between an individual and the financial institutions, and lack of or inadequate trust in the financial systems (Camara et al. 2014).

1.2 WHY FINANCIAL INCLUSION

Its main aim is to encourage access to formal financial services mainly to the underserved including the poor, disadvantaged groups, women and those that depend on informal financial systems. United Nations Capital Development Fund, (Accessed May 2019) indicated that financial inclusion is a fundamental enabler of other Sustainable Development Goals which are; poverty alleviation, attaining gender equality, eradicating hunger, and empowerment of women, realizing food security and encouraging sustainable agriculture, promoting healthy living and well-being, supporting industry, encouraging economic growth and decent jobs, reducing inequality and promoting innovation and infrastructural development. Financial inclusion also helps in overcoming market conditions that would hinder activities undertaken in favor of the poor and underprivileged through monitoring and regulating financial markets to promote savings, investments and consumption that can spur growth.

Poverty or lack of a disposable income is also a major contributor to financial exclusion. Financially excluded sections of the society comprise mainly of small vendors, marginal farmers, informal laborers, migrants, tribal minorities, urban slum inhabitants, socially excluded groups, physically challenged people and women; who are more likely to be poor. In response to this, the

World Bank enacted the Universal Financial Access 2020 initiative to reduce the number of unbanked population globally, with the main focus being on 25 countries that account for 73% of the financially excluded persons and Kenya is one of these countries. The action structure for the Universal Financial Access is implemented through expanding digital payment instruments, expanding access points and achieving balance through social transfers. This can be realized through improvement of the ICT infrastructure for payments, formulating regulatory frameworks that are conducive, and strengthening political commitments towards achieving financial inclusion (World Bank, 2015). Inclusive financial services enable individuals to borrow, save money and make payments digitally. Also, having an account with a trustworthy bank boosts savings which can be used by the bank on intermediate business loans that could further foster investments hence promoting economic growth (EBRD, 2016-17)

According to CGAP et al. (2013), the World Bank Group president indicated that universal reach for financial services is possible through technological advancement, transformative business models and ambitious reforms. The global partnership for financial inclusion helps countries and institution to set targets that are aligned to promoting financial inclusion while maximizing beneficial development and growth. Through target setting, countries are more accountable and are able to set comprehensive and sensible view of the dimension of financial inclusion which enables them to manage challenges effectively and track progress. This is vital due to its apparent link to financial sector stability, integrity and consumer protection. Although financial service providers seek to meet their own business driven targets while ensuring convenience in the access of their services and promoting customer satisfaction, recently, most of the private sector players have started to articulate common global financial inclusion goals (CGAP et al., 2013).

1.3 SOCIOECONOMIC INEQUALITY AND FINANCIAL INCLUSION

As per the World Bank Global Findex database (2014), some of the socio-economic determining factors of financial inclusion are gender, age, religion, level of income, level of education, and area of residence. Disparities in the access of financial services is a major concern as financial services are mostly concentrated in urban areas and men tend to have higher access to mainstream financial services. Persistent inequality in income and wealth majorly in many developing countries is still

a detrimental issue which has led to the need for enacting policies that seek to address the threat that it poses.

Equal income distribution among populace gained worldwide attention after the 2007-2008 global financial crisis hence policies focusing on achieving this were enacted. This is because inequality in wealth and income results in; underinvestment and utilization of human capital (Galor and Zeira 1993), decreased aggregate demand (Carvallo and Rezai 2014), obstruct intergenerational mobility (Corak 2013) consequently, resulting in social conflicts perils. Therefore, financial inclusion is important because of its trickledown effect as it promotes growth in the level of employment, enhances the entrepreneurial sector and increases the level of GDP.

Financial access has increased from 42% in 2011 to 82% in 2018 with 86% of the increase being attributed to males with transaction accounts and 78% being attributed to females (CBK et al., 2019). Despite the tremendous progress, gender still plays a major role in financial inclusivity as women lag behind in accessing and using financial services which can be attributed to low financial literacy at 75%, collateral requirements at 66% and the socio-cultural environment at 63% (Alliance for Financial Inclusion, 2017).

1.4 INEQUALITY OF OPPROUNITY

John Roemer (1998) identified inequalities to be as a result of either circumstances or effort; inequality due to circumstance is caused by factors that are beyond an individual's control whereas inequality by effort is due to factors that individuals' can be held partially accountable for. According to Roemer, inequalities that are as a result of personal responsibility may be fair and morally acceptable while those that are not maybe classified as unjust and unfair. He advocates for equality of opportunity among individuals as this ensures a level playing ground for people to achieve their potential including earning better income. In addition, Roemer proposes that individuals should be rewarded for outcomes due to their efforts and also compensated for outcomes due to circumstances resulting to fair wealth distribution and reduction in inequality and poverty. In a world of equal opportunities, the success of an individual should only reflect their choices, efforts and talent but not the circumstances or background of the individual like ethnicity, sex, parental characteristics among others.

This study examined inequality of opportunity in financial inclusion with the focus on gender. Inequality of opportunity occurs when members of a particular society are not presented with the same opportunities as others and some of its shortcomings are; unequal distribution in growth benefits across different regions and sub groups defined by similar circumstances, unexploited use of skills, social exclusion and poor dynamism in adopting technological innovations. Inequality of opportunity is important because it helps policy makers comprehend the link between inequality and economic growth (Ferreira 2008), and this is vital in enacting policies that promote equality and widen the coverage rate of financial services. Discriminatory policies lead to social unrest hence to promote social cohesion policy makers need to curb regional poverty differences and inequalities. The EBRD (2016), points out that equity and development are essential elements because of two main reasons; inequality of opportunity can bring about social conflicts due to injustices and inequality as a result of circumstances brings about economic inefficiencies.

1.5 PROBLEM STATEMENT

Financial inclusion, among other things, aims at ensuring that the unbanked population can access and use mainstream financial system. Formal financial system offers unlimited access to proper, secure and affordable financial services. According to Beck, (2016), there is empirical evidence that poverty reduction and decrease in income related inequalities are associated with increase in access to financial services. In addition, he emphasizes that availability of proper and appropriate financial services involvement and participation of the less privileged in economic activities would result in improvement of their living standards.

According to the CBK et al. (2019), the percentage of Kenyans who could access mainstream financial services rose from 75.3% in 2015 to 82.9% as of 2018. In spite of this, the amount of women with access to mainstream or formal financial services remains low at 80% compared to men at 86%. This necessitates implementation of policies that are redistributive. Additionally, the Transition report (European Bank for Reconstruction and Development, 2016-17) , highlights need for equality of opportunity in financial access and indicates that the access to education or financial services should not be limited on the basis of an individual's circumstances such as race, place of birth, gender or parental upbringing as this would lead to poor skills utilization, negative outcome on long-run economic growth and loss in confidence in political and economic institutions. It is

therefore important to provide a level field of opportunities for everyone to enable them participate in financial activities.

The International Monetary Fund (IMF) (2012), through Financial Access Survey pronounced that fewer women than men accessed and used formal financial services. According to Demirguc-Kunt (2013), the major causes of the differences were discrimination towards women, societal attitude and other norms. Discrimination towards women was portrayed by gender-based violence targeted on women, low representation in leadership, early and forced marriages among other atrocities. In conclusion, they emphasized that gender inequalities and parity in financial inclusion are mainly due to improper presentation and scrutiny of indicators of financial inclusion. All these empirical evidences support the need for financial inclusion in the society and especially among women.

Previous studies tend to address the question of whether financial inclusion has helped reduce the gender gap through their findings on access to financial services focused on inequalities due to income disparities and the effect on welfare. Although, evidences show that inequality of opportunity influences women's access and consumption of financial services, most studies have either concentrated only on association between financial access and women however, based on our literature review, no study in Kenya has attempted to evaluate inequality of opportunity in financial access and assessed the role of gender. Accordingly, this paper will bring in the aspect of equality of opportunity in financial inclusion which eliminates circumstances such as area of residence, gender and family background from being a barrier in the access of financial services. Additionally, the study constructed a multidimensional index of financial inclusion for Kenya which is useful in identifying determinants of financial inclusion and can help track economic growth and development.

1.6 RESEARCH QUESTIONS

1) What is the coverage rate of opportunity in financial inclusion?
2) What inequalities exist in financial inclusion?
3) What are the drivers of inequality of opportunity in financial inclusion?

1.7 OBJECTIVES OF THE STUDY

1) To determine the extent of financial inclusion in Kenya.
2) To examine the extent of financial inclusion by gender variation
3) To estimate the extent of inequality of opportunity in financial inclusion in Kenya
4) To estimate the percentage contribution of each circumstance to unequal opportunity or chance in financial access

1.8 JUSTIFICATION OF THE STUDY

The results and the recommendation of this research paper will be of impact to financial institutions and the government in providing objective analysis of the importance of facilitating overall access and ensuring opportunities are equitable across regions. This may form a good basis for policy adjustments and reforms of the existing financial regulations to foster equal opportunity in promoting financial inclusivity.

To the stakeholders of the industry and potential entrants to the market, this research will provide vital insights into the challenges that need to be addressed and opportunities that are created through favorable terms of setting up financial institutions.

This study will also provide a basis for evaluating the viability of using financial inclusion to reduce inequalities and alleviate poverty as the methodology used measures the extent to which circumstances affect access to various opportunities. Inequality of opportunity has mainly been applied in the Health and Education hence adopting it in finance it will deem enriching to the available literature. Scholars interested in pursuing and advancing the theoretical framework discussed herein in this field will be able to explore any knowledge gap and make great contributions to the already existing research theories either in critique or accolade.

CHAPTER TWO: LITERATURE REVIEW

2.1 INTRODUCTION

This chapter outline the economic theory and experiential evidence in regards to financial inclusion, social justice, inequalities and macroeconomic variables that promote financial inclusion.

2.1.1 Indicators of Financial inclusion

Financial inclusion can be measured through access, quality, usage and its impact. According to Allen (2016), both country and individual characteristics influence the extent of financial inclusion. Country characteristics such as high quality financial institutions, political instability, legal framework governing financial institutions, cost of opening a bank account and disclosure issues by financial institution affects inclusivity. With respect to individual characteristics, the probability of being financially included depends on the level of education, gender, marital status, area of residence and employment status among other things. Demirguc-Kunt (2013) also states that religion influences financial inclusion for examples Muslims were found to be less probable to have bank accounts or save formally as compared to Non-Muslims.

2.1.2 Concept of Social Inclusion

Social inclusion encompasses involvement in production, consumption, social networks and decision making in a society hence promotes the availability of opportunities that counter conflict and poverty. When individuals are excluded from participating in societal activities this has an adverse effect on inequality and poverty. The universal provision of basic opportunities can be a realistic social goal through increasing the coverage rate of these basic services with a bias towards the deprived groups in a community.

2.1.3 Financial Development and Income Inequality

Financial development seeks to reduce the cost incurred in delivering financial services through the expansion of financial institution which are paramount in increasing access and use of financial services hence fostering economic progression and poverty alleviation. The dimensions of

financial advancement have been overlooked due to serious gaps on data regarding who can access financial services and the hurdles that can promote broader access. The presence of market imperfections such as high transaction cost and information asymmetry limits the opportunity of financial access to the poor. Moreover, lack of collateral and credit histories among the poor also reduces the chances of financial access but through financial development this can be averted as it promotes the relaxation of these constraints hence reducing inequalities among the poor. Levine (1993) argues that financial instruments and institutions arise to mitigate information asymmetry and transaction costs which highly influences technological innovations, savings rates, investment decisions and long term economic growth and development.

To broaden the scope and depth of financial systems, financial institutions need to diversify to cope with shocks and enhance macroeconomic stability. In cross country regression, the existent of efficient financial systems ensures that capital is channeled to productive use, reduces information asymmetry, provides insurance against shocks and can possibly alleviate poverty and dissimilarity (Beck, Demirguc-Kunt, and Levine, 2004).

According to Schumpeter (1912) vital technological innovations are fundamental in promoting long-run economic growth and these innovations in the financial sector are derived from the ability to broaden credit access (Hicks, 1969). (Banerjee and Newman, 1993) and (Aghion and Bolton, 1997) emphasizes on the link between inequality and development through the operation of capital market. Additionally, the Kuznets theory holds that in the initial stages of capital accumulation, inequalities tend to increase whereas on later stages inequalities reduce. Even though the poor have access to investment opportunities, due to market imperfections it may be difficult for them to exploit them fully construing income inequality. As a result, this necessitates expansion to access to credit which may both increase elasticities between economic growth, reduction of inequalities and reducing poverty.

2.1.4 Financial Inclusion, Gender Inequalities and Poverty

According to World Bank (2018), financial access has increased from 42% in 2011 to 82% in 2018 with 86% of the increase being attributed to males with transaction accounts and 78% being attributed to females. World Bank (2012), indicated that financial inclusion contributes majorly in reduction of susceptibility amongst the less privileged through improved saving and credit

facilitation which in turn improves their living standards and cushions them against financial instabilities.

In spite of financial inclusion growth in Kenya, usage of proper financial services especially among women remains low. According to Campero and Kaiser (2013), elements of financial inclusion can be classified into two broad groups. These are demand and supply side determinants. Demand side determinants comprise individual income, education, age among other aspects whereas supply side determinants include availability of infrastructure, cost, alternatives among others. In addition, World Bank (2015) emphasizes that perceptions and attitudes portrayed by individuals directly influences their choice of their preferred financial institutions or services. On the other hand, Tuesta (2015), links level of education, gender, level of income, age among other factors to the consumption of formal financial services.

In the recent past, various scholars have recognized a very apparent gender variance in financial services access and usage. According to Demirguc-Kunt (2013), analysis of the Global Findex data on Ninety-Eight developing countries recognized a solid indication of gender differences in formal financial services usage and access. Despite great strides being made in increasing the population of financially included persons through advances in technology and mobile banking, the gender gap threatens the sustainability of achieving key sustainable development goals that are achievable through financial inclusion. To address the issue, scholars have sought to understand the causes of the gap through measuring disparities in income and wealth distribution given opportunities.

The high level of poverty in developing countries including Kenya has drawn major attention to structures that can be put in place so as to eradicate poverty; one of these structures is financial inclusion. According to World Bank as at 2017 the number of unbanked adults stood at 6.7 million out of 26.4 million; with many of these individuals relying on informal systems to supplement their low incomes especially those in rural areas (Germidis, Kessler 1991). Nevertheless, reforms in the formal financial segment, the number of individuals who rely on informal financial services has waned. Financial inclusion has shown great strides in promoting gender equality through increasing the quantity of individuals who can access and use financial services, promoting savings

and usage of various services such as insurance and payment systems which improve the living conditions of the beneficiaries hence reducing poverty.

The AFI (2010), indicates that each country or region experience dissimilar barriers to financial inclusion. This is due to factors such as level of infrastructure, geographical situations, transactional costs, financial literacy among other factors. In an effort to financially include the over 2.5 billion poor people, the Maya declaration was incepted in 2011 and there has been an increase in commitments with 66 countries committing themselves as of July 2018 according to a 2018 progress report. The declaration seeks to unlock the economic and social capability of economies through financial inclusion by harnessing technological innovations that support the availability of affordable financial services, integrating consumer protection and utilizing data for cognizant policymaking for ease in tracking progress.

2.1.5 Financial Systems in Kenya

Aduda and Kamunda (2012) established that the contributing factors of financial inclusion vary reliant on on the level of a country's economic development and geographical location. They added that policymakers should be clear in their course of translating financial inclusion into operational terms to facilitate tracking of progress and measuring the impact of policy reforms. It is evident that intensifying the scope of policy experiments that are properly evaluated eases implementation. In Kenya, the number of financially excluded individuals registered a drop from 41.3% in 2006 to 17.4% in 2016 (CBK et al., 2016).

In Kenya, some of the initiatives embarked on include implementation of mobile money services, enactment of microfinance legislation and the roll out of agency banking model. The embracing of mobile money transfers in Kenya has accelerated since the introduction of MPESA in 2007 which has also spread out in other East African countries. This has helped fuel financial inclusion due to its high reliability and accessibility in transferring money hence increasing outreach. According to a report by the Communications Authority of Kenya active mobile subscribers rose from 41.0 million to 42.8 million hence the penetration level increasing from 90.4% to 94.3%

hence the need to tap into this when seeking to reduce gender inequality through creation of policies that favor women's aquiring financial services.

The use of Information and Communication Technology has spearheaded the success of these systems bringing about economic and social change worldwide. ICT helps in reducing poverty through improving access to education, health facilities, government services and financial services and connecting businesses to the market. Demirguc- Kunt et al (2015) accounts that Africa is leading in the use of mobile banking hence having the highest population that owns mobile money accounts estimated at 10% or more and this is especially evident in Eastern Africa countries.

2.1.6 Inequality of Opportunity

Inequality of opportunity majorly accounts in determining the level of redistribution and relevance of policies meant to address inequalities. Individuals' capacity to make financial decisions is dependent on the available options as different obstacles exist in different continents. In the context of developing countries, the poor tend to be underserved due to financial market imperfections such as high transaction costs and info asymmetry which limit their opportunity to access and use financial services majorly because they lack credit histories, collateral and connections leading to increased inequality and low growth opportunities.

Regions with pervasive inequality of income, and where groups defined by circumstances are excluded from participation in socioeconomic progress, efforts towards attaining equality of opportunity provide a better guide for public policies. Sustainability of equality of opportunity can be attained when individuals' exogenous circumstances (gender, race/ethnicity, birthplace and family background) do not play a role in determining outcome.

Studies conducted in the past have focused on determining inequalities from outcomes with social inequalities being measured by the degree of income inequality and minimal attention has been given to inequality of opportunity as a result of circumstances. Therefore, this study aims to fill the gap through the use of Human Opportunity Index to measure inequality of opportunity more systematically in financial inclusion in Kenya with key focus on gender.

2.2 THEORETICAL LITERATURE REVIEW

Roemer's Theory of inequality

Early contributions of John Roemer theory in the measurement of equality of opportunity are incorporated in this paper. Roemer coined the principle of equality of opportunity, this constitutes a situation where the distribution of outcomes of a particular service are identical across social groups and is independent of their circumstances. Roemer's (1998) contribution on egalitarianism focused on reducing inequalities that are deemed unfair which are associated with gender, race, parental background and ethnicity. He advocated for a level playing field of opportunities to everyone to the access of services and inequalities dues to an individual's circumstances should not act a hindrance. In his paper, inequalities that are acceptable are ones that are as a result of effort but inequalities due to one's circumstances are ethically unjustifiable because they're beyond human control.

Roemer (1998) and Peragine (2004) pointed out that the barriers to accessing basic services that are beyond the control of individuals is as a result of low capability and being socially excluded hence the need for compensation as such shortcomings in the opportunities available may hinder putting of effort and this reflects poorly on broader aspects of economic growth. It is crucial to promote equality of opportunity as it fosters economic efficiencies and improves social cohesion development.

Kuznets curve theory

The Kuznets curve theory postulates that in early stages of economic development per capita income inequalities increases before the benefits of growth spread throughout the economy until it reaches a peak then declines. This is evidenced by the work of Greenwood et al. (1988) where they argue that the distributional results of financial development are dependent on the magnitude of a country's economic development. High level of economic development is directly proportional to reduction in income inequalities and at initial stages of development only the rich enjoy the profits of financial development. Greenwood et al. also argues that at the preliminary stages of financial enhancement, inequalities in income rise until the financial sector stabilizes.

Theory of Justice

John Rawl's theory tries to conceptualize liberty and equality. The theory births justice as fairness, and advocates that the allocation of goods and services in a society should be distributed in a just manner. Justice as fairness is based on two ideologies; equal liberty doctrine and difference principle;

i. Equal liberty doctrine- focuses on fair equal opportunities across groups which ensures that justice does not only benefits those with advantageous social classes

ii. Difference principle- suggests that inequalities are only justified if they are to the advantage of those that are well off.

Basic financial services ought to be distributed equally across regions independent of individual circumstances to foster social fairness and cohesion.

2.3 EMPIRICAL LITERATURE

2.3.1 Financial Inclusion, Poverty and Inequality of Opportunity

Camara et al. (2014) constructed a multidimensional index using Principal Component Analysis (PCA) and used the index to measure the degree of financial inclusion. They found out that macroeconomic variables such as financial stability GDP per capita, efficient financial systems and education determine the extent of financial inclusion. Therefore, through the use of the index, countries and institutions could be able to establish the contributing factors of financial inclusion and its impact on economic growth.

Early measurements of the view on equality of opportunity were analyzed by Gavaria (2006) where he tried to understand the views of Latin Americans on whether individuals' ability to move out of poverty could be accredited to lack of opportunities or efforts. 74% of the population believed that everyone is not accorded same opportunities and 64% believed that poverty was caused by factors not emanating from effort. Evidently, effort was not considered important in socioeconomic advancements.

Prieto et al. (2018) measured the inequality of opportunity in the access of superior education in Florida and they aimed at explaining how far a given distribution of individual outcomes arises from equal opportunity. The aspects considered were participation, attainment and achievement and they found out that, students enrolled in the School District of Hillsborough County (SDHC) did not have the equal opportunities. In the enrollment stage students with high socioeconomic status had a higher chance of attending high performing schools. Access was unevenly distributed among children of different race/ethnicity whereby black children opportunity were below the overall coverage level of education. Consequently, the socio-economic status of a child was a major determinant of being enrolled in high quality schools. The decomposition analysis showed that circumstances, location of the school and social economic status of the children were a significant contributor to inequality of opportunity.

Jemmali et al. (2014) assessed inequality of human opportunities using a random sample of households drawn in Tunisia. They found out that the most significant aspects that affect dissimilarity in housing services and education are gender, area of residence, education level and the expenditure of the household head. Thus, they recommended the investment of programs that promote illiteracy alleviation, curbing gender discrimination and redistributive development especially in the rural areas.

Niehus and Peichel (2013) conducted a study on upper bounds of inequality of opportunity using theory and data from Germany and the US by use of harmonized data from national panel surveys and found that, from lower bounds estimation, individual earnings were determined mainly by one's effort and to a less extent by their circumstances while to a large extent the upper bound estimates showed that individual earnings were pre-determined by exogenous circumstances. Although the upper bounds estimates do not portray the true picture of inequality of opportunity (IOP) they provide better estimates and show the extent of IOP.

2.3.2 Financial Stability and Financial Inclusion

According to Hannig et al. (2010), empirical evidence on financial stability and inclusion on the 2007-2008 financial crisis, shows that financial innovations can have devastating systematic impacts to the economies globally and hence the need for setting international standard and having

national regulators to implement the financial regulations and guidelines. Furthermore, they noted that innovations aimed at reducing financial exclusion should strengthen financial systems rather than weakening them. To this effect it is important for policies endorsed to regulate financial institutions, and promote financial inclusion.

Adhikary and Bagli(2013), carried out a research on the influence of Self Help Groups on financial inclusion, in District of Bankura where they used multiple regression model to estimate financial exclusion and binary logit model to estimate access to financial services. They found that membership to a Self-help group and the duration in which one has been registered significantly accelerates financial inclusion. Ways in which financial exclusion could be reduced is by encouraging financially excluded individuals to join these groups as it places them in a better position to access financial services.

2.4 SUMMARY OF THE LITERATURE

Financial inclusion is fundamental in stimulating economic growth and in the reduction of income and gender related inequalities hence there is dire need to ensure financial services are equally available to all without any form of discrimination due to individual characteristics. The regulatory framework within which financial institution operate should also promote financial inclusion through financial development as a result of technological innovations which reduce the cost of delivering these services.

CHAPTER THREE: METHODOLOGICAL APPROACH

3.1 INTRODUCTION

This chapter presents the theoretical model, model specification, estimation technique, definition of variables and data source.

3.2 THEORETICAL FRAMEWORK

Paes de Barros et al. (19-43) and Molinaset al. (38) measured inequality of opportunities in the Caribbean and Latin America by use of Human Opportunity index (HOI) and were able to realize the opportunities that needed to be presented to children to achieve equality in education and provision of basic services hence HOI was applied in this study. HOI is important because it helps track variations in opportunities to enable policy makers to design policies that break the cycle of inequality hence improving outcomes. The Human opportunity index approach is constructed by analyzing basic opportunities to measure how circumstances associated to differentiated socioeconomic factors impact on inequality.

This approach proceeds in two-step manner; first a dissimilarity index is used to gauge if available opportunities are allocated equitably by comparing circumstances sub groups' probabilities of accessing certain basic opportunities. Secondly, the dissimilarity index is joined with the absolute level of opportunities to form the Human Opportunity Index.

The Human Opportunity Index helps in identifying the most disadvantaged groups therefore, more emphasis should be directed towards them to ensure that they enjoy social benefits regardless of their circumstances.

This paper used the Human Opportunity Index (HOI) to quantitify the coverage or availability, inequality of opportunity and utilization rate of financial services in Kenya using Human Opportunity Index (HOI), a Stata add on module using multidimensional indicators. The study constructed a multidimensional index that uses weighting approach and incorporates the demand and supply side of financial inclusion. The study used Shapley decomposition technique to

established the determinants of inequality of opportunity in financial inclusion. This was implemented using HOISHAPLEY Stata add on module. Stata 14 was used for analysis.

3.3 MODEL IDENTIFICATION AND ESTIMATION

The core objective of this study is to construct a multidimensional index of financial inclusion and examine inequality of opportunity in financial inclusion main focus on gender in Kenya. The Dissimilarity Index, which has been used in the field of sociology and applied in dichotomous outcomes, will be applied in the measurement of the coverage rate of opportunity and the Human Opportunity Index will be applied to track coverage rates and the existing gaps to accessing financial services.

3.4 THE ECONOMETRIC MODEL

To compute the financial inclusion index, the principal component analysis (PCA) is used which estimates the dimensions of financial inclusion. We take into consideration both demand and supply side dataset weights of individuals. Demand side components focus on barriers and utilization of financial services whereas the supply side components focus on the access to financial services. The measurements of financial inclusion therefore are access, usage and barriers to financial services whose indicators are specified below. This study focused on usage and barriers in measuring inequality of opportunity in financial inclusion.

Figure 1: Measurements of financial inclusion

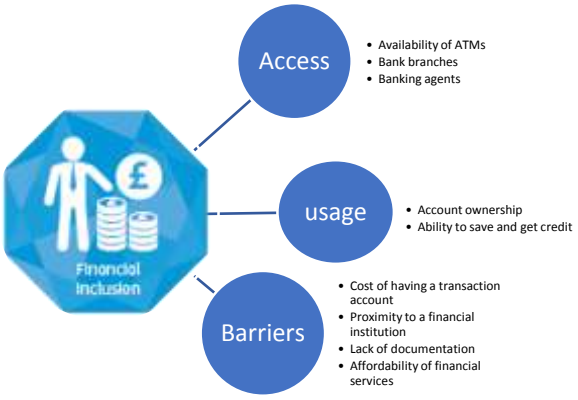


Table 1: Dimensions of financial inclusion

Usage/demand	
Ownership of an account	Having either a bank/mobile money account
Being able to get credit	Ability to get credit from a bank, a Sacco or a microfinance institution
Being able to save	Being able to save in a bank, a microfinance institution or a Sacco
Barriers	
• Cost of having a transaction account • Proximity to a financial institution • Lack of documentation • Affordability of financial services	Variable was coded 1 if involuntarily financially excluded and 0 otherwise

To measure inequality of opportunity the financial inclusion function will be given by;

$$F_{ij} = f(C_{i,}\, x_i, e, \varepsilon)$$

Where F_{ij} is the sub group division of financial outcomes for an individual, C_i is the set of circumstances faced by an individual, x is the control variables, e is the effort factors and ε is the error term. Here the barriers to accessing financial services will be the circumstance variables.

The coverage rate of opportunity in access of financial services will be measured using the Dissimilarity Index (D-index) through groups defined by circumstance features then compared to the overall rate of coverage for the entire populace. It is given by the equation below:

$$D = \frac{1}{2\bar{F}} \sum_{i=1}^{n} \alpha_i |F - F_k|$$

Where n is the number of circumstance group, F_i is the coverage rate of the circumstance group i and α are the subset of circumstance group i of the total population. D-index varies from 0 to 1; at 1 there's high IOP and at zero it represents perfect equality. The Human Opportunity Index will be used to measure the coverage rate of opportunity after discounting distribution of the inequality across groups. It is given by the equation below:

$$HOI = (1 - D)W$$

HOI ranges from 0 to 100. As the coverage rate increases the HOI increases.

3.4.1 Inequality of Opportunity Measure

To measure the opportunity of individuals accessing and using financial services, we adopt the logistic regression method. We assume the probability of using financial services to be 1 and 0 if otherwise and a vector of variables that indicate the circumstances which are gender, area of residence,level of education, household size, age, proximity to a financial institution and marital status, $X_i = X_{1i,}\ X_{2i}, \dots, X_m$.

Individuals with the same circumstances belong to the same group type. Six steps are followed to achieve this:

1) Estimate a logistic regression model to ascertain whether the an individual's use of financal services is a function of their circumstamces using the maximum likelihood approach.

$$L_n\left(\frac{P(1=1|x_1,x_2,\dots,x_m)}{1-P(1=1|x_1,x_2\dots,x_m)}\right) = \sum_{k=1}^{m} \beta_k(X_k) \dots\dots\dots\dots\dots\dots\dots\dots(1)$$

2) From the estimation (1) above we will obtain coefficients estimates(β_k), and the predicted probability ($\widehat{p_i}$)of using financial services based on the relationship of the coefficient and the vector of circumstances of the population.

$$\widehat{p_i} = \frac{Exp\left(\hat{\beta} + \sum_{k=1}^{m} X_{ki}\ \widehat{\beta_k}\right)}{1 + Exp\left(\widehat{\beta_o} + \sum_{k=1}^{m} X_{ki}\ \widehat{\beta_k}\right)} \dots\dots\dots\dots\dots\dots\dots\dots.(2)$$

3) Proceed to calculate the overall coverage rate for financial services represented by F, which provides the fraction of the population that has access to particular opportunities.

$$F = \sum_{i=1}^{n} \alpha_i \widehat{p_i} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3)$$

4) Calculate the dissimilarity index as shown below; where n is the aggregate population and $\alpha_i = \frac{1}{n}$

$$\widehat{D} = \frac{1}{2\bar{F}} \sum_{i=1}^{n} \alpha_i |\widehat{p_i} - F| \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (4)$$

5) Compute the usage and barriers to services that are unevenly allocated through,

$$\mathrm{P} = \mathrm{F} * \widehat{\mathrm{D}} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (5)$$

6) The final step will be to compute the HOI, discounting the inequality of distribution from the overall coverage rate F which will be given by;

$$HOI = F - P \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (6)$$

To determine the contribution of each circumstance variable we introduce a potential function. Therefore, the contribution of one circumstance variable is given by the difference between the potential of the whole set on one hand from which this specific variable has been removed for an inequality index. The Shapley value decomposition rule was used to compute the marginal contribution of each variable. The Shapley value is advantageous because it's responsive to inequality index chosen, however, as presented by Shorrocks (1982) its limitation is the inability to respect independence.

3.4.2 Data, data source and diagnostic tests

The study used the National Fin Access data of 2018 collected by the Central Bank of Kenya (CBK), Kenya National Bureau of Statistics (KNBS) and Financial Sector Deepening Kenya (FSDK).

Table 2: Definition of variables

Dependent variable	**Measurement**	**Expected sign**
Usage • Ability to save • Ability to get credit	Equal to 1 if currently using and 0 otherwise	
Barriers • Reason for non-bank use	Equal to I if involuntarily financially excluded and 0 otherwise	
Independent/ Circumstance variable		
Gender	This variable was coded 1 if female and 0 otherwise	Negative
Area of residence	This variable was coded 1 if urban and 0 otherwise	Positive
Education level	This variable was coded 1 if education attained was above secondary level and 0 otherwise	Positive
Age	This variable is continuous, it shows age of the respondents	Positive
Household size	This is a categorical variable	Positive
Marital status	This variable was coded 1= married, 2=formerly married and 0=never married	Positive

A brief definition of the study population was done in order to understand the data well. All the data management and analysis was done using STATA statistical software version 14 and results presented in tables. To construct the multidimensional financial inclusion index, Principal Component analysis was used whereas to find inequality of opportunity the HOI index was used.

The following diagnostic tests were conducted;

I. Kaiser-Meyer-Olkin (KMO) test- measured how adequate the sample of each variable is in the model and for the complete model.

II. Normality test was conducted to test the overall importance of the correlation subgroups.

III. Heteroskedasticity test was used to determine whether the variance varies across observations.

CHAPTER FOUR: EMPIRICAL FINDINGS

4.1 Introduction

This chapter discusses the results of data analysis. The research topic investigates inequality of opportunity in financial inclusion in Kenya: The gender perspective and the data used is the National Fin access household survey for 2018. An index for financial inclusion was constructed and the Human Opportunity Index was used to measure disparity of opportunity. The analysis had two outcomes variables: usage and barriers of financial services. The circumstance variables used in the analysis are education level, gender, age of the respondent, residential area, household size and the marital status.

4.2 Data processing- cleaning and weighting

In order to achieve proportionality of the sample allocation to the size of the strata, the primary datasets of the 2018 National Fin Access household survey were weighted. Given that some of the sampled households were not interviewed due to various reasons, the sample had to be weighted to accommodate for non-proportional cluster distribution and non-response. This ensures that estimates provided are illustrative of the target population at both national and sub-regional levels. The below mathematical relation was applied to achieve this:

$$W_{hi} = D_{hi}\ x\ \frac{S_{hi}}{1_{hi}} x \frac{C_{hi}}{c_{hi}} x \frac{I_{hij}}{1}$$

Where;

W_{hi} -is the overall weight cluster for the i-th cluster in the h-th stratum

D_{hi} –is the sample cluster design weight attained from cluster choice probabilities for the i-th cluster in the h-th stratum

S_{hi} –Number of listed households in the i-th cluster in the h-th stratum

I_{hi} –Number of responsive households in the i-th cluster in the h-th stratum

C_h –Number of groups in h-th stratum

c_h –Number of selected clusters in h-stratum

I_{hij} –Number of listed qualified individuals within the j-th household in the i-th cluster in the h-th stratum

4.3 Principal Component Analysis (PCA)

To construct the multidimensional index for financial inclusion the PCA was used. The multidimensional measurement of financial inclusion is useful because;

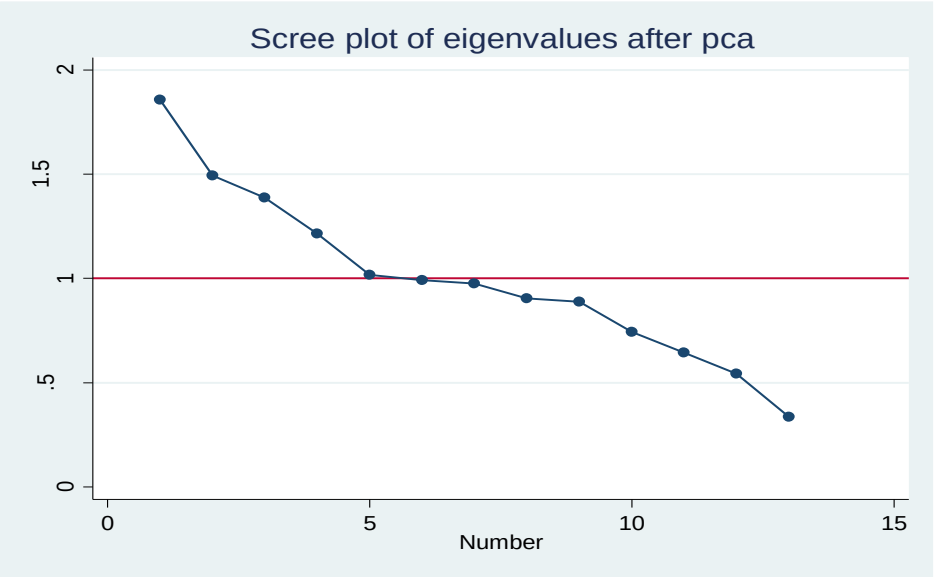
i. It aggregates financial inclusion identifiers into a distinct index which helps in monitoring evolution over time
ii. Using a better measure of financial inclusion allows studying the comparison between financial inclusion and other macroeconomic variables
iii. Information captured on the different dimensions of financial inclusion makes it possible to counter challenges facing inclusivity which is beneficial in policy making and evaluation.

Figure 1 plots the eigenvalues of the variables used to construct the financial inclusion index, the component with eigenvalues above 1 are retained as they explain the variation in the index and are significant. They collectively explain 53.6% of the variance in the index.

Table 3: Eigen values of the variables used to construct the FI index

Component	Eigenvalue	Difference	Proportion	Cumulative
Comp1	1.858	0.364	0.143	0.143
Comp2	1.494	0.107	0.115	0.258
Comp3	1.387	0.173	0.107	0.364
Comp4	1.214	0.198	0.093	0.458
Comp5	1.016	0.023	0.078	0.536
Comp6	0.993	0.016	0.076	0.613
Comp7	0.977	0.073	0.075	0.688
Comp8	0.904	0.017	0.070	0.757
Comp9	0.888	0.143	0.068	0.825
Comp10	0.744	0.100	0.057	0.883
Comp11	0.644	0.100	0.050	0.932
Comp12	0.544	0.207	0.042	0.974
Comp13	0.337	.	0.026	1.000

Figure 2. Eigen values of the variables used to construct the FI index



Sources: National Fin access Household data and own calculation

To ascertain the sample adequacy, the Kaiser-Meyer-Olkin (KMO) measure was used and an overall KMO statistic of 0.5327 was obtained hence the sample is fairly adequate to be measured using the principal component analysis.

Table 4: Sample adequacy measure

Variable	kmo
bankac	0.5722
mmoney_ac	0.5540
savingmfi	0.5101
saving_mbank	0.5946
saving_mmoney	0.6007
saving_sacco	0.5218
sacco_credit	0.5174
mficredit	0.5035
govtcredit	0.6840
emplcredit	0.5957
digital_creditt	0.6649
barriers	0.5266
distance	0.5622
Overall	0.5327

4.4 Descriptive statistics

The statistics under consideration are the mean, the standard deviation and the minimum and the maximum values.

The survey was based on a population of 8,669 households across 47 counties in Kenya. Among them 41.65% live in urban areas and 57.75% of the population is female.

Table 5: Descriptive statistics of the circumstance variable for Financial Access

Descriptive Statistics

Variable	Obs	Mean	Std.Dev.	Min	Max
Residence	8669	.417	.493	0	1
Gender	8669	.577	.494	0	1
Education	8669	.287	.452	0	1
Hhsize	8669	3.974	2.322	1	21
Age	8669	39.294	17.104	16	95
Marital	8669	.912	.64	0	2
Religion	8669	1.121	.387	0	5
Distance	8669	2.872	.551	0	5

4.5 Correlation Analysis and Normality test

Table 6: Correlation Matrix

Matrix of correlations

Variable	Residence	Gender	Education	Household size	Age	Marital	Religion
Residence	1.000						
Gender	-0.020	1.000					
Education	0.254	-0.110	1.000				
Hh size	-0.198	0.027	-0.148	1.000			
Age	-0.162	-0.025	-0.160	-0.151	1.000		
Marital	-0.143	0.161	-0.196	-0.085	0.554	1.000	
Religion	0.019	0.018	-0.081	0.173	-0.011	0.021	1.000

There is weak degree of correlation among the independent variables hence no multi-collinearity problem.

To assess normality, the Shapiro-Wilk W test was used

Table 7: Normality Test (usage)

Variable	Obs	W	V	z	Prob>z
Usage	7,222	0.99908	3.439	3.277	0.00052
Residence	8,669	0.99993	0.311	-3.114	0.99908
Gender	8,669	0.99998	0.09	-6.434	1
Education	8,669	0.99966	1.509	1.097	0.13626
Household Size	8,669	0.98062	85.251	11.855	0
Age	8,669	0.94027	262.794	14.857	0
Marital	8,669	0.9999	0.455	-2.1	0.98213
Religion	8,669	0.94477	242.989	14.648	0
Distance	8,669	0.90457	419.846	16.106	0

Table 8: Normality Test (barriers)

Variable	Obs	W	V	z	Prob>z
Barriers	6,496	0.99923	2.639	2.566	0.00514
Residence	8,669	0.99993	0.311	-3.114	0.99908
Gender	8,669	0.99998	0.09	-6.434	1
Education	8,669	0.99966	1.509	1.097	0.13626
Household Size	8,669	0.98062	85.251	11.855	0
Age	8,669	0.94027	262.794	14.857	0
Marital	8,669	0.9999	0.455	-2.1	0.98213
Religion	8,669	0.94477	242.989	14.648	0
Distance	8,669	0.90457	419.846	16.106	0

The dependent and independent variables are normally distributed. This is explained by the W statistic being greater than 0.7 and close to 1.

4.6 Heteroskedasticity test

LM test (Variable addition version)	
chi2(7) = 66.52	**Prob > chi2 = 0.0000**

Source: Compiled from Stata

The probability value of chi-squared was found to be 0.0000. This is less than 5% alpha level of significance. The null hypothesis of homoskedasticity was rejected. Heteroskedasticity was thus corrected using robust standard errors.

4.7 Empirical results

4.7.1 Logistic regression

Table 9 presents the model estimates for the opportunity to use and the barriers that exist in the provision and consumption of financial services. For the usage of financial services, a decrease of 2.94 in the log-odds of being financially included is expected when individual is a female. An increase of 12.16 in the log-odds of being financially included is expected when an individual has attained secondary level education or higher and a decrease of 4.95 in barriers that hinder an individual from being financially included.

Also an increase of 7.64 in the log-odds of being financially included is expected when an individual resides in an urban area instead of a rural area and a decrease of 3.27 in barriers that hinder inclusivity.

Table 9: Logistic regression (Usage)

Usage	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
Gender	-0.211	0.072	-2.94	0.003	-0.351	-0.070	***
Education	1.332	0.110	12.16	0.000	1.118	1.547	***
Household size	-0.003	0.016	-0.17	0.864	-0.034	0.029	
Age	-0.013	0.002	-5.85	0.000	-0.017	-0.008	***
Marital status							
Married	0.313	0.093	3.37	0.001	0.131	0.496	***
Formerly married	-0.529	0.124	-4.25	0.000	-0.773	-0.285	***
Residence	0.577	0.076	7.64	0.000	0.429	0.725	***
Constant	1.712	0.142	12.07	0.000	1.434	1.989	***

Mean dependent var	0.830	SD dependent var	0.376
Pseudo r-squared	0.089	Number of obs	7222.000
Chi-square	587.958	Prob > chi2	0.000
Akaike crit. (AIC)	6016.857	Bayesian crit. (BIC)	6071.936

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

Table 10**:** Logistic regression (Barriers)

Barriers	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
Gender	-0.065	0.063	-1.04	0.300	-0.189	0.058	
Education	-0.415	0.084	-4.95	0.000	-0.580	-0.251	***
Household size	0.022	0.013	1.67	0.096	-0.004	0.048	*
Age	-0.008	0.002	-3.62	0.000	-0.012	-0.004	***
Marital status							
Married	-0.709	0.076	-9.28	0.000	-0.859	-0.559	***
Formerly married	-0.540	0.114	-4.72	0.000	-0.764	-0.316	***
Residence	-0.216	0.066	-3.27	0.001	-0.346	-0.087	***
Constant	-0.346	0.116	-2.99	0.003	-0.572	-0.119	***

Mean dependent var	0.230	SD dependent var	0.421
Pseudo r-squared	0.028	Number of obs	6496.000
Chi-square	194.050	Prob > chi2	0.000
Akaike crit. (AIC)	6828.035	Bayesian crit. (BIC)	6882.267

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

4.7.2 Model marginal estimate for the opportunity to be financially included

The marginal effect explains the difference in the dependent variable for a change in the explanatory variable. For both models (usage and barriers), the household size is not statistically significant, however, the education level, age, marital status and the area of residence are statistically significant in explaining financial inclusion. The gender coefficient is negative which means when all else is equal, females are less likely to use financial services. From the results a

unit increase in the female cluster, the likelihood of being financially included decreases by 2.7% points while attainment of education by one level increases the likelihood of using financial services by 13.7 %.

Also when an individual was formerly married when all else is equal, they're less likely to utilize financial services with a lower likelihood of 8.5%. Individuals living in urban area and are married when all other predictor variables are constant, are additionally likely to use financial services by 7.1% and 4.0% points respectively.

Table 11: Marginal effects (usage)

	dy/dx	Std.Err.	Z	P>z	[95%Conf.	Interval]
Gender	-0.027	0.009	-2.980	0.003	-0.045	-0.009
Education	0.137	0.008	16.380	0.000	0.120	0.153
Hhsize	-0.000	0.002	-0.170	0.864	-0.004	0.004
Age	-0.002	0.000	-5.890	0.000	-0.002	-0.001
Marital Status						
married	0.040	0.013	3.200	0.001	0.016	0.065
formerly_married	-0.085	0.020	-4.200	0.000	-0.125	-0.045
Residence	0.071	0.009	8.130	0.000	0.054	0.088

Note: dy/dx for factor levels is the discrete change from the base level.

In the case of barriers, education level and the area of residence variables are statistically significant. The marginal effects can be interpreted as follows; a unit increase in the level of education, decreases the likelihood of encountering barriers associated with financial inclusion by 6.6% points whereas a unit increase in the individual living in urban areas decreases the likelihood of encountering financial usage challenges by 3.7% points.

Table 12: Marginal effects (barriers)

	dy/dx	Std.Err.	Z	P>z	[95%Conf.	Interval]
Gender	-0.011	0.011	-1.030	0.302	-0.033	0.010
Education	-0.066	0.012	-5.350	0.000	-0.091	-0.042
Hhsize	0.004	0.002	1.670	0.095	-0.001	0.008
Age	-0.001	0.000	-3.630	0.000	-0.002	-0.001
Marital Status						
Married	-0.131	0.015	-8.720	0.000	-0.161	-0.102
formerly_married	-0.104	0.021	-4.850	0.000	-0.146	-0.062
Residence	-0.037	0.011	-3.340	0.001	-0.058	-0.015

Note: dy/dx for factor levels is the discrete change from the base level.

4.7.2 Inequality of opportunity

Inequality of opportunity estimates how an existing set of limited opportunity is fairly distributed. Equality of opportunity occurs when the access and distribution of various opportunities are independent of individual circumstances. Barriers hinder the access and usage of financial services and it could be caused by factors such as low literacy levels, lack of documentation, lack of income and lack of collateral to acquire credit. Therefore, to achieve financial inclusivity, the access and utilization of financial services should not be hindered by circumstances related to household socioeconomic and demographic background which are beyond their control. This is achieved by the use of the D index that measures how dissimilar access rates are to a financial service for clusters defined by circumstance features.

4.7.3 Human Opportunity Index

The Human Opportunity Index (HOI) combines coverage and inequality in a single calculation by portraying the share of obtainable opportunities that have been disseminated according to the ideology of equality of opportunity. Table 12 shows that HOI for financial usage and barriers. The value of HOI for financial usage is at 81.35% which shows 81.35% of financial services are

equitably distributed and only 18.65% is unequally distributed. This could be attributed to technological innovation that ease digital payments and the high usage of mobile money to perform transactions. Additionally, the human opportunity index by gender shows that males have a higher prospect of using financial services as compared to men with a percentage of 87.37% and 83.45% respectively.

Table 13: Inequality measure and in financial inclusion

	Usage		**Barriers**	
	Values	**Std. Error**	**Values**	**Std. Error**
Inequality Measure				
Coverage(C)	85.27	0.49	25.68	0.69
Dissimilarity Index (D)	4.59	1.07	12.86	4.65
Human Opportunity Index (HOI)	81.35	0.61	22.38	0.67
	Usage		**Barriers**	
Decomposition by Gender				
	Male	**Female**	**Male**	**Female**
Coverage(C)	87.37	83.45	27.19	24.48
Dissimilarity Index (D)	4.15	4.94	14.96	11.48
Human Opportunity Index (HOI)	83.75	79.33	23.12	21.67

4.7.4 Shapley decomposition value

Shapley decomposition reveals that a large percentage of inequality in the consumption of financial services is explained by Education level at 37 % followed by area of residence at 29% and age at 13%. Gender does not explain much of the contribution to financial usage with a percentage of 5.87. Education contribution to an individual not being financially included could be explained by most of the population sample having not completed secondary school education. This could be as a result of difficulties such as poverty and unemployment hence parents lacking fees to cater for the school expenses for their children hence resulting in them dropping out of school.

Table 14: Contribution of circumstances to Inequality of opportunity

Shapley Decomposition of the D-Index (Percentage explained by each variable)
Usage

Gender = 5.872546565044543
Rsidence = 29.37744837292323
Education = 37.93029889680415
Hh_size = 1.416000225288991
Age = 13.47655047248808
Marital = 11.92715536189504

Barriers
Gender = 4.069450978886552
Residence = 6.190908747142474
Education = 15.53067293508453
Hh_size = 7.898348053315242
Age = 30.83804793140942
Marital = 35.47256750268583

In the case of barriers, age explains the highest percentage at 30%. This could be explained by young people lack collateral to acquire credit and high levels of unemployment leave many without money to save.

CHAPTER FIVE: CONCLUSIONS AND POLICY RECOMMENDATION

Preceding research on financial inclusion depict the pointers of financial inclusion, inequalities and welfare aspects around the subject but few measure the equality of opportunity in the access of financial services. This study complements the contribution of these studies. Access and usage of financial services is enabler to: Saving which creates a pool for banks to make credit available; individuals can access credit to expand their businesses and engage in investments activities. Also the usage of financial services promotes innovation in the ICT sector which makes financial services easily accessible and transactions to be undertake in a seamless manner due to institutions embracing technology.

Inequality of opportunity consider the circumstances of individuals in the access and utilization of available opportunities. Circumstances ought to be independent of the chance of utilizing basic services or individuals' outcome. More often, the inequality of chances is undermined between various classes in a given region and this gives rise to not only the problem of equality but as well of equity. From the analysis, gender does not explain much of the inequalities that bring about financial exclusion however, the usage of financial services is higher among men as compared to women. Education explains the highest percentage of inequalities in financial inclusion hence there's need for the government to promote completion of education and do follow ups on school discontinuation. The government ought to promote successful transition from one level of education to the other while promoting gender parity and economic empowerment of parents to enable them pay for school fees with minimal difficulties.

The Human Opportunity Index allows for the analysis and evaluation of the possible inequalities in the usage of financial services as well the percentage of contribution of variables that hinder inclusion. This is vital and can be adopted by governments before rolling out any policies to ensure the success rates of implemented policies especially those geared towards achieving the Sustainable development goals.

Through analyzing inequality of opportunity in financial inclusion, it is evident that despite the tremendous growth in the number of Kenyans reported to financially included, there exists inequalities in the distribution of these services especially among classes differentiated by gender

and the area of residence. Policy makers need to evaluate the current policies of promoting financial inclusion, make projections and revise goals in place and optimize the number of individuals who are financially included. This is because when individuals are able to easily access and utilize financial services, it has a positive impact on the development of businesses, investments and to a larger extent improves their standards of living.

It is recommended that the government should incorporate the assessments used herein in measuring inequality to identify policies that need further evaluation to help in the design and implementation of policies that provide a level playing field for all in the access and utilization of financial services.

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