

**ESSAYS ON FINANCIAL INCLUSION AND WOMEN EMPOWERMENT: THE
AFRICAN PERSPECTIVE**

By

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ABSTRACT

The literature suggest that finance plays a central role in promoting inclusive growth. This means that equal access to affordable finance to all economic agents, which is referred to as financial inclusion, plays a crucial role in promoting economic growth, poverty reduction, and income inequality reduction in an economy. Despite the importance of financial inclusion, the statistics show that there are more than 1.7 billion financially excluded adults globally. In Africa, it is estimated that less than one in every four (4) adults own an account in the formal financial service sector, which means that the level of financial inclusion in Africa is low.

The importance of financial inclusion to growth and development has, thus, resulted in development agencies (like the World Bank and the IMF) and governments implementing policy interventions to improve the level of financial inclusion in countries across the globe. This makes measuring the level of financial inclusion in an economy critical to a country. Infact, the World Bank roadmap to universal financial access highlights how to move people from being unserved (financially excluded) to being served (financially included). Per roadmap, the availability of affordable basic financial services such as payments, credit, savings, insurance, and remittances to adults can help to improve the levels of financial inclusion in an economy. Any comprehensive financial inclusion measure must, therefore, incorporate these services.

Financial inclusion is suggested as multidimensional concept, hence, it is best measured by an index. Previous studies that attempted to measure financial inclusion, however, used single indicators, which failed to capture the multidimensional nature of financial inclusion. The other studies created a financial inclusion index using only bank data, thus, failing to adequately capture the other critical financial industry services like insurance and remittance. To improve on previous

studies and add to the existing literature, this study includes insurance in constructing a financial inclusion index (FII) for 14 sampled African countries during the study period (2000 to 2021). The results of the study show that, apart from Sierra Leone that recorded an average FII of 0.30, the other 13 sampled countries had average FII below 0.30. Per the Sarma (2008; 2012) classification, therefore, only Sierra Leone can be classified as a medium financial inclusion country whilst the 13 other sampled countries fall within the low financial inclusion category. The results is in line with studies that found that countries in Africa generally have low levels of financial inclusion. The study also investigates the factors that drive financial inclusion in Africa and finds that inflation and urbanisation increase the level of financial inclusion whilst dependency ratio, and gross national income per capita dampen the level of financial inclusion. Further, the study finds that domestic credit to the private sector, education, money supply are insignificant in determining the level of financial inclusion in Africa during the study period.

The literature suggest a possible threshold effect of financial inclusion on economic growth and income inequality. The second essay of this study, therefore, investigates the threshold effect of financial inclusion on economic growth and income inequality in Africa. First, the study finds when FII is less than 0.37 (that is $FII < 0.37$), the coefficient is insignificantly positive, which suggests that economic growth is insensitive to FII that falls below this region. However, when FII is equal to or greater than 0.37, the coefficient is significantly positive, which suggests that economic growth improves when FII increases beyond 0.35 score. Second, the study finds FII reduces income inequality faster when it is above a threshold value of 0.05 in Africa. Thus, given the fact the all the countries recorded FII beyond 0.05, the study suggests that financial inclusion positively impacted the sampled countries in during the study period.

The literature suggest that despite the importance of financial inclusion to inclusive growth, women, who form the majority of Africa's population, are more disproportionately financially excluded compared to men in Africa. Further, the literature suggest that access to finance has the ability to improve women empowerment. The third essay, therefore, focused on examining the impact of financial inclusion on women empowerment in Africa in both the short-run and long-run. To achieve this, the study uses the gender inequality index (as proxy for women empowerment) as dependent variable. The comprehensive FII created in objective one (1) of this study is used as independent variable of interest as well as other independent variables. The study employs panel ARDL to estimate the long-run and short-run relationships between financial inclusion and women empowerment in Africa and finds that financial inclusion improves women empowerment in short run but decreases the level of women empowerment in the long run in Sub-Saharan Africa.

Overall, the study finds evidence to support the argument that financial inclusion is central to promoting economic growth, reducing income inequality, and improving women empowerment (in the short-run) in Africa. The study, therefore, recommends the following. First, African governments should implement policies and programmes that create a steady macroeconomic environments and stable political climate to promote financial inclusion. Second, regulators of the financial sectors must create confidence in the financial sector and develop/offer the right products and services to encourage the patronage and usage of the formal financial sector by all economic agents. Last, financial literacy campaigns must be intensified to educate all the segments of the population that formal financial sector is for all economic agents, not just for men, the rich, educated and urban dwellers.

DECLARATION

I, **Abraham Nii Adoteye Saka**, hereby declare that this thesis is the results of my own work and has not been presented by any person for any academic award in this or any other university, except sections duly acknowledged in the references. This is being submitted in fulfilment of the requirements for the award of a Doctor of Philosophy from the University of the Witwatersrand, Johannesburg, South Africa.

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DEDICATION

I dedicate this thesis to my family, to my late father and mother and to my siblings who have all supported and encouraged me throughout the period of my studies

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Though I acknowledge that I am responsible for this thesis, it is, however, the product of years of interaction with, and inspiration by, several people who have invested their precious time, expertise and financial resources to see me through to this end. I now acknowledge them.

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LIST OF ACRONYMS

ADT	Automatic Deposit Teller
AfDB	African Development Bank
AFI	Alliance for Financial Inclusion
API	Application Programming Interface
ATM	Automatic Teller Machine
AU	African Union
BIS	Bank for International Settlements
BLUE	Best Linear Unbiased Estimator
CLRM	Classical Linear Regression Model
COVID-19	Corona Virus 19
DF	Digital Finance
DFI	Digital Financial Inclusion
DFS	Digital Financial Services
DV	Dependent Variable
FAS	Financial Access Survey
FDI	Foreign Direct Investments
FE	Financial Exclusion
FGM	Female Genital Mutilation
FII	Financial Inclusion Index
FinTech	Financial Technology
FIs	Financial Intermediaries
G20	Group of Twenty
GDP	Gross Domestic Product
GINI	GINI Coefficient
GLM	Generalised Linear Model
GLSS	Ghana Living Standards Survey
GMM	Generalised Method of Moments
GNI	Gross National Income
GNP	Gross National Product
Govt.Spend	Government Spending
ICT	Information and Communication Technology
IFC	International Finance Corporation
IFRS	International Financial Reporting Standards
IMF	International Monetary Fund
INFL	Inflation
KYC	Know Your Customer
LDV	Limited Dependent Variable
LI	Legislative Instrument
MDGs	Millennium Development Goals
MFS	Mobile Financial Services
MSE	Mean Squared Error
NFIDS	National Financial Inclusion and Development Strategy
NFIS	National Financial Inclusion Strategy

OLS	Ordinary Least Squares
OxCGRT	Oxford COVID-19 Government Response Tracker
P2P	Person to Person
PCA	Principal Component Analysis
PG&L	Politics, Governance, & Leadership
PNDCL	Provisional National Defense Council Law
PoG	Parliament of Ghana
PoS	Point of Sale
PPE	Property, Plant and Equipment
PSP	Payment Service Providers
PwC	PriceWaterCooper
SDGs	Sustainable Development Goals
SSA	Sub-Saharan African
Telcos	Telecommunication companies
UFA	Universal Financial Access
UN	United Nations
UNDP	United Nations Development Programme
UNION	African Union
USSD	Unstructured Supplementary Service Data
VIF	Variance Inflation factor
WB	World Bank
WBG	World Bank Group
WDI	World Development Indicator
WHO	World Health Organisation

CHAPTER 1

INTRODUCTION

1.1 Background to the Study

Africa can boast of many natural resources but due to lack of equitable distribution (access and usage) of these resources, citizens of Africa remain amongst the poorest people in the world (Beegle & Christiaensen, 2019; Candia, Coibion, & Gorodnichenko, 2020; Jemli & Chtourou, 2022; Nwani & Osuji, 2020; Triki & Faye, 2013). Despite various attempts by African governments and development organisations, the continent and the people are still poor, and the prevalence of poverty and income inequality are still too high (Beegle & Christiaensen, 2019; Nwani & Osuji, 2020). Recent reports show that Africa has approximately 40% of its people being extremely poor (World Bank, 2018). Even against the people living under US\$1.9 per day benchmark, the Africa has the most poor after Asia (Koomson, Villano, & Hadley, 2020b, 2020c; Nsiah, Yusif, Tweneboah, Agyei, & Baidoo, 2021; Nwani & Osuji, 2020).

The literature show that shared prosperity, which improves the livelihoods of people, is absent on the African continent (Nwani & Osuji, 2020; Triki & Faye, 2013). Most African countries suffer from deepening poverty, widening income disparity, and slow or no economic growth (Nwani & Osuji, 2020; Triki & Faye, 2013). The literature show that the incidence of poverty and income inequality is prevalent in rural areas compared to urban areas (Beegle & Christiaensen, 2019). It is estimated that rural dwellers account for 81% of the extremely people in Africa (Beegle & Christiaensen, 2019). Further, extreme poverty and income inequality is found to be pervasive amongst women compared to men in Africa (Ahinkorah, Hagan Jr, Ameyaw, Seidu, & Schack, 2021; Beegle & Christiaensen, 2019; Koomson, Bukari, & Villano, 2021; Koomson et al., 2020b, 2020c).

Africa is at a critical point where growth and development must be equitable amongst all economic agents, which calls for paradigm shift towards inclusive growth (Ali & Son, 2007; Triki & Faye, 2013). In recent times, therefore, many developing economies have adopted policies and strategies centered around inclusive growth and development that benefits all citizens (Ali & Son, 2007; Triki & Faye, 2013). Inclusive growth is where there are equal opportunities for every economic agent (irrespective of their respective circumstances) (Ali & Son, 2007; Candia et al., 2020; Jemli & Chtourou, 2022). Inclusive growth and development enable every economic agent participate in and contribute to the growth process equally (Ali & Son, 2007; Candia et al., 2020; Jemli & Chtourou, 2022).

Finance plays a critical role in promoting inclusive growth in an economy (Ali & Son, 2007; Nizam, Karim, Rahman, & Sarmidi, 2020; Nsiah et al., 2021; Zins & Weill, 2016). On the other hand, lack of access to finance stifles inclusive growth and development because it represses economic growth and development, widens income inequality amongst economic agents, and increases the prevalence of poverty within an economy (Demirgüç-Kunt & Cihak, 2015; Demirgüç-Kunt, Honohan, & Beck, 2008).

Finance is predominantly provided by the formal financial sector and for most countries, the formal financial sector is made up of the banks, insurance companies, and capital markets (Zins & Weill, 2016). The financial sector provides savings, borrowing, making payments, remittance, and insurance services to economic agents (Zins & Weill, 2016). For instance, the financial sector enables individuals and households to save some of their disposable income for future projects and eventualities, take loan for things like home purchase and education, pay taxes to government, and take an insurance or pension, amongst other things. Also, businesses can secure loans from the

financial sector, which can deploy into productive/profit-making activities to create employment and pay taxes to government. Overall, the economy benefits from these activities and taxes paid by households and businesses (Zins & Weill, 2016). The empirical literature suggests that inclusive growth can result from an inclusive financial sector; referred to as financial inclusion (Beck, Senbet, & Simbanegavi, 2015; Cournède, Denk, & Hoeller, 2015; Triki & Faye, 2013).

Financial inclusion refers to all initiatives to ensure that formal financial services and products are available, accessible and affordable to all segments of the population (Amidžic, Massara, & Mialou, 2014; Hannig & Jansen, 2010; Triki & Faye, 2013). Financial inclusion is, therefore, a very an important development priority because it can lead to poverty alleviation; especially amongst women, the poor and vulnerable, and help boost economic progress (Bateman, Duvendack, & Loubere, 2019; Erlando, Riyanto, & Masakazu, 2020; Evans, 2016a; Nsiah et al., 2021; Zins & Weill, 2016).

Despite the fact that financial inclusion was not one of the main targets of United Nation's (UN) 2030 Sustainable Development Goals (SDGs), the literature suggest that financial access is a key enabler to achieving 8 out of the 17 SDGs (Arner, Buckley, Zetzsche, & Veidt, 2020; Demirgüç-Kunt & Singer, 2017; Emara & Mohieldin, 2020; Klapper, El-Zoghbi, & Hess, 2016; Kuada, 2019; Nanziri, 2016; Wanyama, 2016). These include SDG #1 that aims to eliminate extreme poverty in all its forms; SDG #2 that aims to reduce hunger, promote food security, and foster sustainable agriculture; SDG #3 that aims to ensure good health and well-being across the world; SDG #4 that aims to achieve quality education for all; SDG #5 that aims to improve gender equality and promote economic women and girl-child empowerment; SDG # 8 that aims to achieve shared economic growth and job creation; SDG #9 that aims to promote innovation, and infrastructure growth; and SDG # 10 that aims to reduce inequality and help to sustain income equality within

and across countries (Demirgüç-Kunt & Singer, 2017; Kara, Zhou, & Zhou, 2021; Klapper et al., 2016).

Notwithstanding the importance of access to finance and the role the financial sector plays in development, it has been estimated that there are 1.7 billion financially excluded adults globally, which means they have no access to accounts, savings, credit, ability to make payments in the formal financial sector (Demirgüç-Kunt, Klapper, Singer, Ansar, & Hess, 2020; Van, Vo, Nguyen, & Vo, 2021). The literature shows that financial exclusion is pervasive in developing countries compared to the developed world (Asongu, 2017; Kuada, 2021; Nsiah et al., 2021; Ozili, 2021). It is estimated that less than one in every four (4) adults (less than 25%) in Africa own an account (financially included) in the formal financial service sector (Asongu, 2017; Demirguc-Kunt & Klapper, 2012; Kuada, 2021). Financial exclusion has been identified as a global challenge because it disproportionately affects twomen, the poor, and rural dwellers compared to men (Khmous & Besim, 2020; Nanziri, 2016; Ozili, 2021; Yin, Yang, & Mehran, 2013).

Financial exclusion amongst African women has been acknowledged as a serious challenge because women make up more than half of the world's population; including the Africa (Bertay, Dordevic, & Sever, 2020; Cuberes & Teignier, 2014; Delechat, Newiak, Xu, Yang, & Aslan, 2018; Teignier & Cuberes, 2014). Women tend to be poorer (with an ever-existing cycle of poverty) compared to men (Alhassan, Li, Reddy, & Duppati, 2019).

The literature suggest that women are more financially excluded because of discrimination, gender inequality, and government policies that have failed to deliberately acknowledge women as essential to the economic growth and development process (Duflo, 2012a).

The lack of access to the formal financial sector tend to encourage women to rely on the informal financial sector such as personal social networks and loan sharks for their basic financial needs (Allen, Demirguc-Kunt, Klapper, & Peria, 2016; Hess, Klapper, & Beegle, 2021). This makes them vulnerable and susceptible to exploitation or theft by these informal financial sector players (Alhassan et al., 2019). Thus, lack of access to finance remains a major predicament for women in Africa (Kehler, 2001). Achieving gender equality is critically important because women form half of the global population so gender inequality against women only hurts growth of the global economy (Assembly, 2015; Bertay et al., 2020; Carlsen, 2020; Esquivel & Sweetman, 2016; Griggs et al., 2013).

The literature suggests that having basic access to the formal financial system can greatly enhance women economic empowerment (Ashraf, Karlan, & Yin, 2010; Nsiah et al., 2021). Also, financial access would help to close the inequality gap between men and women, which can result in improvements in the overall social and physical wellbeing of women (Cabeza-García, Del Brio, & Oscanoa-Victorio, 2019). The Maya Declaration is an important drive to encourage a financially inclusive economies to reduce the prevalence of poverty and encourage financial stability in a truly inclusive and equitable manner to all (both men and women) (Koomson, Villano, & Hadley, 2020a; Villaseñor, West, & Lewis, 2015).

1.2 Statement of Problem

The literature suggests that financial inclusion makes products and services of the formal financial sector available, easy to access and use, and affordable to all economic agents (Agyekum, 2017; Nsiah et al., 2021; Ozili, 2020a, 2020b; Park & Mercado, 2021) Thus, individuals can own accounts, take up insurance covers and pension policy, make payment, access loans and credit, send and receive remittances (both within the country and overseas) (Allen, Demirguc-Kunt,

Klapper, & Peria, 2012; Koomson et al., 2020b; Zhang & Posso, 2019). It is, however, estimated that there are over 1.7 billion unbanked adults globally and only 43% of African adults own bank accounts (Findex, 2017). Also, it is estimated that only 12% of the adult population in Africa banked and borrowed from a regulated financial institution whilst only 16% of adults banked and saved with a regulated financial institution (Findex, 2017). This means that Africa's adult population (particularly in rural Africa) still have limited financial access in the formal financial sector, which calls for urgent action to improve financial inclusiveness amongst economic agents in Africa (Koomson et al., 2020b, 2020c).

Though the financial sector structure may differ across African countries, the existing literature suggest that the financial functions include savings and investment, provision of access to credit, provision of payment systems and remittances, insurance and pension, management of risk, aiding foreign transactions, and building social capital (Aggarwal, Demirgüç-Kunt, & Pería, 2011; Fanta & Mutsonziwa, 2016a; Sarma, 2008).

Previous studies on financial inclusion have restricted their studies to banks, thereby, neglecting the other formal financial services providers such as insurance companies, finance companies, pension funds, and capital market (Cámara & Tuesta, 2014; Koomson et al., 2020b, 2020c). By using only banks, the previous studies failed to capture other vital financial functions such as insurance and pension. Thus, there is a huge literature gap. This study, therefore, helped to address this deficiency in empirical literature by expanding the financial inclusion conversation to include both banking and insurance industries. To this end, this study filled the highlighted literature gap by constructing a comprehensive and a more representative financial inclusion index using data from both banking and insurance industries

As discussed earlier, women account for more than half of Africa's adult population (Fanta & Mutsonziwa, 2016a) so having them being financially included offers the potential for a greater, faster, and more inclusive economic growth and development in Africa (Fanta & Mutsonziwa, 2016a). There is, however, a huge financial inclusion gender gap between men and women in Africa (Ashraf et al., 2010; Demirgüç-Kunt, Klapper, & Singer, 2013; Fanta & Mutsonziwa, 2016a; Kapoor, 2014; Yin et al., 2013). Men are more financially included compared women (Beck & Brown, 2011; Demirgüç-Kunt et al., 2013; Fanta & Mutsonziwa, 2016a; Moore, Presbitero, & Rabellotti, 2017; Nanziri, 2016; Wale & Makina, 2017). The existing literature suggest men tend to more financially included compared to women due to a number of reasons. First, men tend to be more favourably treated and deliberately enabled to have access to the formal financial services compared women (Henderson, Herring, Horton, & Thomas, 2015). Second, gender inequality is mostly against women than men (Aslan, Deléchat, Newiak, & Yang, 2017; Demirgüç-Kunt et al., 2013). Third, women are less empowered and disproportionately discriminated against financially, economically, socially, religiously, and politically compared to men (Demirgüç-Kunt et al., 2013; Henderson et al., 2015).

This means that more women are not enjoying the full benefits of having access to formal financial sector because they are financially excluded compared to men (Ashraf et al., 2010; Aslan et al., 2017; Fanta & Mutsonziwa, 2016a; Moore et al., 2017; Nanziri, 2016; Yin et al., 2013). What is the extent of the potential harm of women financial exclusion, what is the impact of financial inclusion on women empowerment in Africa? The quest for answers to these questions motivates one of the study's objective to examine the effect of financial inclusion on women empowerment in Africa. Such a study is missing in Africa's empirical literature. It is worth mentioning that,

whereas there is growing interest in financial inclusion, a review of literature showed that very little empirical studies have been conducted in Africa with reference to women empowerment.

The literature suggests that financial inclusion promotes improvements in the welfare of individuals and households and can lead to women's empowerment (Ashraf et al., 2010; Koomson et al., 2020b). on the other hand, financial exclusion amongst women is counter-productive to promoting women empowerment and improving financial capability amongst women (Aterido, Beck, & Iacovone, 2013). There is the global push to empower women through financial inclusion (Ashraf et al., 2010; Hendriks, 2019; Kantachote, Mallick, Polster, & Roets, 2013). Women empowerment has gained significant attention globally because its ability to reduce discrimination against women and promote development; particularly in under or developing places like Africa (Adjei, 2015; Ashraf et al., 2010; Ruppanner, 2010). It is therefore, imperative to gauge the level of empowerment amongst African women to advise policy directions.

Empowering women is key to inclusive growth in Africa (Adjei, 2015; Ruppanner, 2010; Wekwete, 2014). Through empowerment, women are able to take their own financial and other socio-economic decisions (that is be independent of men), they have the ability to assert their own preferences rather than those dictated by the society (Ruppanner, 2010). The literature suggest that women empowerment hinges on key socio-economic (economic disparity, poverty, education, girl child, and health), political (violence, armed conflict, power sharing, and institutions), and legal (human rights, mass media, and environment) influences (Adjei, 2015). This means that women empowerment must sufficiently incorporate these area as much as possible to be holistic (Union, 2008).

The existing literature suggest there is a relationship between financial inclusion and women empowerment (Siddik, 2017a; Yaumidin, Suhodo, Yuniarti, & Hidayatina, 2017). Recent studies posit that financial inclusion impacts women empowerment, which ultimately leads to inclusive growth and development (Pal, Gupta, & Joshi, 2021). There is evidence from recent studies that access to finance helped to promote women empowerment, improved their consumption and enabled them to increase their savings and productive investments (Ashraf et al., 2010; Yin et al., 2013).

Even though there has been significant progress made with promoting financial inclusion amongst women, empirical studies show that financial inclusion gender gap still persists (Hendriks, 2019). There is the need to find answers to questions in respect of the extent to which financial inclusion impacts women empowerment in Africa, whether closing the financial inclusion gender gap promotes women empowerment for Africa (Hendriks, 2019). Investigating the real relationship between financial inclusion and women empowerment would assist policymakers in drawing more efficient strategies that improve financial inclusion amongst women to ultimately promote greater women empowerment in Africa.

Empirical results on the relationship between financial inclusion and the major development variables such as economic growth, poverty and income inequality reduction showed mixed results; that is a positive relationship, a negative relationship, or an indifferent relationship (Mehrotra & Yetman, 2015; Mohieldin, Iqbal, Rostom, & Fu, 2011). Other studies found evidence to suggest the direction of the relationship between financial inclusion and economic growth and income inequality depends on the economy in question (De Gregorio & Guidotti, 1995; Rahman, Khan, & Charfeddine, 2020). It is no surprise that there are still arguments amongst economists and policy-makers on the distributional implications of financial inclusion amongst economic

agents; particularly for individuals and households (Beck, Demirgüç-Kunt, Laeven, & Levine, 2005; Nsiah et al., 2021; Park & Mercado, 2018).

On the one hand, financial inclusion is suggested to impact aggregate economic growth, promote poverty reduction, and reduce income inequality amongst segments of the population (Beck et al., 2015; Claessens & Feijen, 2007b; Demirguc-Kunt & Klapper, 2012; Triki & Faye, 2013). Beck et. al. (2008) found that countries with deeper inclusive financial systems experienced faster growth rates as well as enjoyed reductions in income inequality and prevalence of poverty. This means that a well-functioning inclusive financial system benefits the poor, creates greater opportunities for advancement, and enhances private investment (Allen et al., 2012; Beck, Demirgüç-Kunt, & Levine, 2007). Burgess and Pande (2005) also highlighted the importance of financial inclusion when they found that state-led expansion of rural bank branches helped to reduce poverty in India. Access to formal financial sector can help reduce the growth of informal sources of credit (such as moneylenders) who often tend to be exploitative of the consumers (Sarma, 2012).

Other studies, however, found that the relationship between finance-growth is not positive in all cases (Sharma, 2016a). In fact, some studies found an opposite and/or varying relationships between financial inclusion (access to finance) and various development indicators such as economic growth, and poverty reduction consumption. Some recent studies found evidence to suggest that financial development helped to improve economic growth (that is output, consumption, and investment growth) but only up to a certain point after which it tipped off (Cecchetti & Kharroubi, 2012; Dabla-Norris & Srivisal, 2013). Johnson & Nino-Zarazua, (2011) found evidence to suggest that financial development strongly led to economic growth but it did

not effectively lead to poverty reduction (Johnson & Nino-Zarazua, 2011). Investigating long-term growth, De Gregorio & Guidotti, (1995) found that the impact of financial development differs across economies. Their study found a positive relationship between financial inclusion and economic growth (using GDP as proxy) in some countries and in inverse relationship between financial inclusion and long term economic growth in Latin American countries (De Gregorio & Guidotti, 1995).

The empirical literature show that recent studies have attempted to test the relationship between financial inclusion and the major development indicators in Africa but these studies have used indicators, which do not sufficiently capture the entire financial sector whilst the other studies had narrow scope in terms of study periods. The following studies are worth mentioning (Koomson et al., 2020b; Mohammed, Mensah, & Gyeke-Dako, 2017). This study addresses this empirical gap.

The study by Agyekum (2017) used financial depth (as bank credit to private sector to GDP ratio) and financial market depth (as stock market capitalization to GDP ratio) as proxies for financial inclusion. Unfortunately, these proxies were restricted to the banking sector, hence, were narrow and failed to adequately capture majority of the financial sector. Mohammed et al (2017) attempted to examine how financial inclusion impacted poverty reduction in Africa. They used four single indicators; namely formal account, savings, withdrawals, and credit to represent financial inclusion (Mohammed et al., 2017). The problem with their approach was two-fold. First, they failed to capture financial inclusion as a multidimensional concept, hence, lost the benefit of representing financial inclusion as an index. Second, their study only used banking data rather than using data on the entire financial sector to represent financial inclusion. The study by Koomson et al. (2020b) only provided empirical literature on the effects of financial inclusion on poverty and vulnerability

to poverty of Ghanaian households without going further than that. Their study found evidence to suggest that expansion of financial inclusion resulted in reduction in the prevalence of household poverty and future poverty by 27% and 28%, respectively. Their study period was, however, narrow (2016 – 2017), hence, too limited to make a meaningful extrapolation for the rest of Africa.

It is, therefore, evident that there is a gap in literature and this provides a real motivation and justification for this study. This study helps to close this gap because it tests the relationship between financial inclusion and economic growth and income inequality in Africa using a comprehensive financial inclusion index. The study, thus, provide answers to questions such as; what is the nature of the relationship between financial inclusion and development variables such income inequality and economic growth in Africa? Is the relationship direct, inverse or indifferent?

1.3 Aim and Objectives of the Research

This study would seek to achieve the following specific objectives:

1. To construct a comprehensive financial inclusion index (FII) for Africa and examine the factors that drive financial inclusion in Africa
2. To examine the threshold effect of financial inclusion on economic growth and income inequality in Africa
3. To examine the effect of financial inclusion on women empowerment in Africa.

1.4 Research Questions

Subsequent to the problem statement, thesis seeks to answer the following research questions:

1. What represents a comprehensive financial inclusion index (FII) for Africa and what are the key factors that drive the level of financial inclusion in Africa?
2. What is the threshold effect of financial inclusion on economic growth and income inequality in Africa?
3. What is the effect of financial inclusion on women empowerment in Africa?

1.5 Significance of the Study

Previous studies used individual indicators as proxies for financial inclusion (Allen et al., 2014; Cihak, Demirgüç-Kunt, Feyen, & Levine, 2012; Naceur, Barajas, & Massara, 2017; Varman, 2005). Using single indicators to represent financial inclusion is problematic because it fails to capture the multi-dimensional in nature, does not tell the full story and can be misleading as to the real extent of financial inclusion (Cámara & Tuesta, 2014). Recent researchers have criticized using single indicators to represent financial inclusion as being too narrow and have recommended using an index to represent financial inclusion (Nsiah et al., 2021; Omar & Inaba, 2020a). These studies, however, used only banking data to construct their indices of financial inclusion (Cámara & Tuesta, 2014; Nsiah et al., 2021; Omar & Inaba, 2020a). This study significantly adds to knowledge because the study constructs an index for financial inclusion in Africa using banking, insurance, and pension data, hence, goes a step better than previous studies. This approach is, therefore, more representative of the financial sectors of most African countries and makes generalization more appropriate compared to previous studies. This study will, therefore, fill significant gap in the existing empirical literature.

This study also uses a more comprehensive financial index to investigate the drivers of financial inclusion in Africa that previous studies failed to achieve. This study, therefore, significantly contributes to the empirical literature by closing the gap.

Empirical results from previous in respect of the relationship between financial inclusion and the major development variables such as economic growth and income inequality reduction showed mixed results (Mehrotra & Yetman, 2015; Mohieldin et al., 2011; Sharma, 2016a). It is no surprise that there are still arguments amongst economists and policy-makers on the distributional implications of financial inclusion for economic agents (Beck, Demirgüç-Kunt, Laeven, & Levine, 2005). By using a more comprehensive financial inclusion index to examine how financial inclusion is related to economic growth and income inequality, this study further provides fresh perspective on the direction of the relationship within the African context.

The study also examines how financial inclusion helps to improve women empowerment, which appears to be a gap in the empirical literature on Africa. This study, therefore, contributes to literature examining the relationship between a comprehensive financial inclusion and women empowerment.

In summary, this study would construct a more comprehensive financial inclusion index for Africa. It would provide an understanding of the drivers of financial inclusion in Africa. In addition, it examines the impact of a more comprehensive financial inclusion on economic growth and income inequality reduction in Africa. It also provides empirical literature on how financial inclusion affects women empowerment. Findings of this study would also help the financial sector players and policy-makers to measure the extent of financial inclusiveness across Africa.

1.6 Scope and Limitations of the Thesis

In terms of scope, this is a 22-year (1980 to 2021) study that focusses on the financial inclusion and its determinants in Africa, the relationships between financial inclusion, economic growth, and income inequality reduction in Africa during, and how financial inclusion impacts women empowerment in Africa. It only covers 14 sampled African countries due to data availability constraints. For the purpose of this study, financial inclusion was measured following the approaches of recent studies who used bank data to construct their respective financial inclusion indices (Cámara & Tuesta, 2014; Nsiah et al., 2021; Omar & Inaba, 2020a) but this study goes a step further by banking, insurance, and pension funds data to construct a more comprehensive financial inclusion index for Africa.

This study is limited because of a number of reasons. First, the study is limited to only 14 countries sampled due to data availability. Second, the study assumed that all the sampled countries are on the same income levels (that is low-income, medium-income, and high income countries), which may not be the case. Third, the concept of financial inclusion is a multidimensional and the literature suggest several dimensions of financial inclusion (such as depth, access, efficiency, barrier, quality) but due to data constraints, this study used only three dimension; namely depth, access, and efficiency to construct the financial inclusion index.

1.7 Structure of the Thesis

The rest of this thesis is structured according to the specific objectives as follows. Chapter 2 constructs a comprehensive financial inclusion index for Africa with data from banking and insurance and investigates the determinants of financial inclusion in Africa. Chapter 3 examines the threshold effect of financial inclusion on economic growth and income inequality in Africa.

Chapter 4 is investigates the relationship between financial inclusion and women empowerment in Africa. Finally, chapter 5 presents a summary, conclusions and recommendations of the various chapters of this thesis.

CHAPTER 2

AN ANALYSIS OF THE DETERMINANTS OF FINANCIAL INCLUSION IN AFRICA

2.0 Introduction

The need for a paradigm shift towards growth and development that benefits every economic agent; irrespective of their circumstance, has received increased attention globally in recent times. Access to finance (financial inclusion) has been identified to play a critical role in promoting growth and development in an economy and it is a key enabler for reducing poverty and improving prosperity (Ali & Son, 2007; Nizam, Karim, et al., 2020; Nsiah et al., 2021; Zins & Weill, 2016). However, the estimates that there are over 1.7 billion adults who are financially excluded (World Bank, 2013). This means they do not have access to formal financial services such as savings, access to credit, payments services, and other basic financial services (Findex, 2017). To this end, financial exclusion has been identified a global challenge; especially in developing countries (Ali & Son, 2007; Nizam, Karim, et al., 2020; Nsiah et al., 2021; Zins & Weill, 2016).

2.1 Concept and Measurement of Financial Inclusion

Financial exclusion presents a global challenge because it represents because it retards economic growth and fuels the prevalence of poverty and income inequality amongst households (Agyemang-Badu, Agyei, & Kwaku Duah, 2018; Ahamed, 2016; Akram, 2018; García Moritán, 2020). In recent decades, there has been a push towards achieving greater levels of financial inclusion because of its suggested benefits to economic agents in any economy (Nguyen & Mogaji, 2021; Nguyen, 2020; Ozili, 2021; Park & Mercado, 2021; Tang, 2022). The literature suggests that financial inclusion is crucial for sustainable economic growth of developing countries (Agyekum, 2017; Cicchiello, Kazemikhasragh, Monferrá, & Girón, 2021; Triki & Faye, 2013).

Despite the importance of financial inclusion, there is no universally accepted definition for the concept of financial inclusion (Nguyen, 2020; Sahay et al., 2015; Tang, 2022). To this end, literature have defined financial inclusion in different ways (Ifediora et al., 2022; Nguyen, 2020; Tang, 2022). Some authors suggest that financial inclusion is where all economic agents have equal access to finance (Demirgüç-Kunt et al., 2020; Nsiah & Tweneboah, 2023; Ozili, 2020a, 2020b). Economic agents here refers to households (especially the poor, vulnerable, and women), the firms (especially small and medium-sized enterprises (SMEs)), and the economy (central government) (Yoshino & Morgan, 2016). Financial inclusion ensures that formal financial services are available, accessible, and affordable to all adults equally (Demirgüç-Kunt et al., 2020; Nsiah & Tweneboah, 2023; Ozili, 2020a, 2020b). The literature suggest that improvements in the level of financial inclusion will bring more economic agents into the formal financial system (Ozili, 2018; Ozili, Lay, & Syed, 2023).

In the past, financial inclusion was measured in respect of the number of people who had access and/or used formal financial services or products (Honohan, 2008). More recently, however, financial inclusion has been measured by how the formal financial sector is available, accessible, and affordable to all adults equally; particularly to those prone to being financially excluded like women and the poor (Cámara & Tuesta, 2017; Sarma, 2008; Triki & Faye, 2013). From the World Bank's perspective, financial inclusion refers to when economic agents are able to access financial products and services such as savings, credit, insurance, payment services, and remittance in an equal and sustainable way (Cámara & Tuesta, 2014; Ghosh, 2020b; Ghosh & Vinod, 2017; Nguyen, 2020).

The literature suggest that the level of financial inclusion in an economy is influenced by demand-side and supply-side and regulatory factors (Aterido et al., 2013; Nsiah et al., 2021; Yoshino & Morgan, 2016; Zins & Weill, 2016). Demand-side factors are drivers of financial inclusion from the perspective of the consumers of the financial services (Nsiah & Tweneboah, 2023; Yangdol & Sarma, 2019; Zins & Weill, 2016). Demand-side factors include but not limited to socio-economic variables such as gender, religion, age, income levels, educational, literacy level, demographics (urban or rural), and marital status (Allen et al., 2016; Barik & Lenka, 2022; Nsiah et al., 2021; Yangdol & Sarma, 2019; Zins & Weill, 2016). On the other hand, supply-side factors emanate from providers of financial services (Adil & Jalil, 2020; Bashiru, Bunyaminu, Yakubu, & Al-Faryan, 2023; Célerier & Matray, 2019; Njenga & Irungu, 2024; Nsiah & Tweneboah, 2023; Wokabi & Fatoki, 2019; Yoshino & Morgan, 2016). Thus, supply-side approach use financial institutions information such as infrastructure, quality of financial services, distance of financial service providers, channels (example the number of ATM and insurance/bank branches), collateral requirements, transaction fees, and regulatory factors to determine the level of financial inclusion (Njenga & Irungu, 2024; Oke & Adamson, 2023; Yoshino & Morgan, 2016; Zins & Weill, 2016). Supply-side determinants can be both from within the country and outside the country (Nsiah & Tweneboah, 2023).

2.1.2 Initiatives to Promote Financial Inclusion

2.1.2.1 International Initiatives

Financial inclusion has received increased attention globally (Badar, Anwar, & Naqvi, 2020; Bekele, 2023; Triki & Faye, 2013). Accordingly, there have significant global initiatives by development and international organizations such as the World Bank Group (WB), Alliance for Financial Inclusion (AFI), the International Money Fund (IMF), and African Development Bank

(AfDB) to promote financial inclusion globally; particularly in developing continents like Africa (Triki & Faye, 2013). The statistics show that the number of financially excluded (unbanked or underserved) adults has reduced from 2.5 billion adults to 1.7 billion adults globally (which means over 800 million adults have been financially included) and much of this positive results can be attributable to the impactful initiatives from the above international organisations (Ho, 2023; Ozili, 2020a; Wang & Shihadeh, 2015).

The World Bank's vision of universal financial access (UFA) is a central agenda in the drive towards ensuring that every adult is financially included (Chitimira & Warikandwa, 2023; Ho, 2023; Sharma & Changkakati, 2022; Swaiss, 2024). Under the universal financial access agenda, the gateway to financial inclusion framework (see Figure 2.1), provides a framework on how to move economic agents from being 'unserved' to being 'served' (World Bank, 2016). In fact, the gateway to financial inclusion framework highlights the fact that access to financial services like savings, credit, payments, insurance, and remittance are crucial to moving adults from being financially excluded to being financially included (World Bank, 2016). That means adults would be able to own account (to save and invest), access credit facility, transact, purchase in insurance policy, send and receive remittances (both locally and internationally) (World Bank, 2016).

Figure 2. 1: The Gateway to Financial Inclusion



Source: World Bank (2016)

The Alliance for Financial Inclusion (AFI) is a member-owned global network of central banks, regulators and member institutions (Ho, 2023). AFI is currently made of over 84 countries (including some SSA countries) and over 90 member institutions (Ho, 2023). AFI partners regulators, in-country private sector organisations and other international development organisations to collaborate to ensure that financial products and services are available to all economic agents in order to reduce the level of financial exclusion at country, regional and international levels (Ho, 2023). AFI adopts approaches such as peer learning, knowledge exchange, peer transformation and practical solutions to promote financial inclusion (Ho, 2023).

Amongst other things, the AFI works towards the objectives of the Maya declaration (Shofawati, 2023; Simatele et al., 2021). The Maya declaration, which is crucial to financial inclusion, was facilitated by AFI and signed by the respective central banks at the AFI Global Policy Forum in Riviera Maya, Mexico in 2011 (Ho, 2023; Voica, 2017). Subsequent to the Maya declarations, there have been further actions, statements, and manifestoes adopted to deepen the level of financial inclusion across the network countries and across the world (see Table 2.1 below).

Table 2. 1: AFI Accords/Statement/Manifesto

No.	Name of Accord/Statement/Manifesto	Year
1	Sasana Accord: Agreement to Strengthen The Effectiveness of the Maya Commitments	2013
2	Maputo Accord. SME Finance: Path to Greater Financial Inclusion.	2015
3	Denarau Action Plan: The AFI Network Commitment to Gender and Women's Financial Inclusion	2016
4	Sharm El Sheikh Accord on Financial Inclusion, Climate Change & Green Finance	2017
5	Sochi Accord: FinTech for Financial Inclusion	2018
6	Kigali Statement: Accelerating Financial Inclusion for Disadvantaged Groups	2019
7	Statement on Post-COVID-19 Recovery: The AFI Network's Commitment on Restoring the Momentum For Achieving Financial Inclusion Goals Bearing in Mind the Need to Be Vigilant To Mitigate Risks That May Jeopardize the Network's Goals	2020
8	The Manila Manifesto: AFI's Commitment To Coordinate, Collaborate, and Engage with Global Standard-Setting Bodies	2023

Source: Author's compilation and Ho (2023)

The Maya declaration has over 71 commitments and over 837 accompanying targets for each national financial inclusion agenda (Harker, 2021; Ho, 2023; Shofawati, 2023; Simatele et al., 2021). These commitments and targets are captured under thematic and sub-thematic areas (Ho,

2023) (see Table 2.2 below). To ensure the fight for financial inclusion remains relevant and sustained, the AFI continues to develop and implement new accords, policies, action plans, commitments and targets on a continuous basis (Ho, 2023). Recent thematic areas such as inclusive green finance (IGF), gender inclusive finance (GIF), small and medium-sized enterprise (SME) finance, FinTech, youth, and forcibly displaced persons (FDPs) are testament to the AFI's approach to sustainable, inclusive, and climate-friendly agenda (Ho, 2023).

Table 2. 2: Maya Declaration Financial Inclusion Thematic Areas

No.	Thematic Area	Sub-Thematic Area
1	Consumer empowerment and market conduct	Financial literacy and financial education
2	Digital financial services/Inclusive FinTech	Agent banking, E-money/E-wallet, National payments system, Mobile financial services, Crowdfunding (P2P lending and equity crowdfunding platforms), Cross-border remittances, payment technologies using digital Know-Your-Customer process and regulatory technology.
3	Financial inclusion data	
4	National strategy on financial inclusion	
5	SME finance	
6	Global standards	Financial integrity, Financial identity, and Financial stability
7	Gender and women's financial inclusion	
8	Financial inclusion for climate change and green finance	
9	Overarching national goal	
10	Credit information system	Alternative credit scoring,
11	Financial inclusion of youth	
12	Microcredit and micro-savings	
13	Microinsurance	
14	Financial inclusion of forcibly displaced persons (FDPs)	
15	COVID	

Source: Ho (2023) and AFI (2022e, 2022f)

On the global stage, the statistics show that between 2011 and 2021, account ownership amongst adults grew from 51 percent to 76 percent respectively (Ho, 2023). The statistics show that developing economies recorded the highest rise when account ownership rose from 63 percent in 2017 to 71 percent in 2021; representing 8 percent rise over the period (World Bank, 2022). Thus, the positive sign is that financial inclusion is improving in developing countries (Ho, 2023).

2.1.2.2 National Financial Inclusion Strategies

Both the World Bank Group and AFI have been instrumental in helping member countries and institutions develop and implement their National Financial Inclusion Strategies (NFISs) (Ho, 2023). NFIS is a plan of actions (roadmaps) created based on national and sub-national pacts to help to improve the level of financial inclusion globally (Ho, 2023; Mhlanga & Denhere, 2020; Porter, 2011). NFIS are aligned with Sustainable Development Goal (SDG). Table 2.3 presents the number of national financial inclusion strategies implemented by countries and the AFI network institutions. A look at Table 2.3 shows the Sub-Saharan African region has the highest number of countries (26 countries) within the AFI network; representing 42 percent of the network. At the high level, 87 percent of countries within the Sub-Saharan region have national financial inclusion strategies whilst 13 percent of the countries are currently formulating their national financial inclusion strategies. At the granular level, the sub-Saharan African region has 68 percent, 28 percent and 4 countries are at the first, second, and third national financial inclusion strategies respectively. Asia is second after Sub-Saharan Africa (SSA) with 12 member countries, which represents 19.4 percent of the Network's membership. Asia is followed by Latin America and Caribbean (LAC) with 9 countries, Pacific (PAC) with 7 countries. Lastly, we have Middle East and North Africa (MENA) and Eastern Europe and Central Asia (EECA) with 4 countries each in the AFI Network.

Table 2. 3: National Financial Inclusion Strategies: State of Practice in 2022

Regions	No. of Member Countries in Region	% of Countries with NFIS in Region	% of Countries Formulating NFIS	% of 1st NFIS	% of 2nd NFIS	% of 3rd NFIS
Middle East and North Africa (MENA)	4	57	29	100	n/a	n/a
Eastern Europe and Central Asia (EECA)	4	57	29	100	n/a	n/a
ASIA	12	92	8	75	8	17
Latin America and Caribbean (LAC)	9	69	15	56	44	n/a
Sub-Saharan Africa (SSA)	26	87	13	68	28	4
Pacific (PAC)	7	88	13	57	29	14

Source: Ho (2023) and AFI (2022a)

2.1.2.3 Government Policy Initiatives to Promote Financial Inclusion in SSA

Governments, policymakers, and financial sector regulators in Sub-Saharan countries continue to implement various policies and initiatives to drive up the level of financial inclusion in their respective countries (Ho, 2023).

2.1.2.4 Financial inclusion in Africa: Progress, Challenges, And The Road Ahead

Africa is the second largest continent after Asia (estimated to covers about one-fifth of the total land surface of the Earth) with a current population of over 1.5 billion people (the median age is 19.3 years). Africa covers an approximate land area of 30, 365, 000 square km (11, 724, 000 square miles). The continent is bounded by oceans on all sides; the Atlantic Ocean on the West, the Indian Ocean and Red Sea on the East, and the Mediterranean Sea on the North of Africa. The continent is made up of both landlocked countries as well as a few islands. Africa is rich in natural resources, great biodiversity, green vegetation (particularly forest), excellent climate, and fossil fuel in its oceans. Africa has 54 countries of which 45 percent of the population is considered urban, which means 55 percent (majority) of Africans are considered rural.

The Sub-Saharan Africa region (located south of the Sahara desert) has seen significant increase in the level of financial inclusion over the past decade. This has been mainly driven by improvements in technology. The literature highlight the fact that technology-enabled financial innovations (also referred to as FinTech) have aimed financial inclusion (AlBenJasim, Dargahi, Takturi, & Al-Zaidi, 2023; Ehrentraud, Ocampo, Garzoni, & Piccolo, 2020; Laidroo, Koroleva, Kliber, Rupeika-Apoga, & Grigaliuniene, 2021). Financial services providers and regulators within the region have continued to put in strategies/interventions and policies that help to promote access and usage of financial services and ensure equal access irrespective of gender, income, education, and age.

The rest of this section discusses financial inclusion strategies in the sampled countries in this study.

Republic of Sierra Leone (Sierra Leone)

Sierra Leone is a West African agrarian economy with an estimated total population of 8.64 million people. Freetown and the Leone (Le) are the capital city and national currency of Sierra Leone respectively. Sierra Leone is a Republic with one legislative house (Parliament). Sierra Leone has a tropical climate and rich in natural resources such as precious minerals (diamonds, gold, bauxite), agricultural & forestry produces (cocoa, coffee, cassava, rice, millet, peanuts, etc). Sierra Leone is bordered on the south by the Gulf of Guinea, which provides the country with fishery products. Sierra Leone is classified as a developing country.

On the 14th of April 2022, Sierra Leone launched its second National Strategy for Financial Inclusion 2022-2026 (NSFI-2). The implementation of NSFI-2 is expected to build on the successes achieved with the implementation of first National Strategy for Financial Inclusion

(NSFI-1) and address the challenges identified in the first strategy. NSFI-2 has three priority intervention areas (PIAs). These are: access to client-centric financial services and products, Digital Financial Services (DFS) and Financial Literacy, and Financial Education, and Consumer Protection.



Republic of Botswana (Botswana)

Botswana is a landlocked South Africa country with an estimated total population of 2.52 million. It is multiparty republic with one legislative house (National Assembly). Gaborone is the capital city and the Botswana Pula (P) is the official currency. Botswana runs a free market economy. Unlike other African countries, Botswana is not rich in vast fertile land for significant productive agricultural cultivation for export for which reason the country's agricultural outputs form less than one-tenth of its gross national product. Botswana, however, has grains (such as corn, millet, and sorghum) and beef cattle that it exports mainly to Europe. In addition, Botswana has precious minerals such as diamond, nickel and copper.

Botswana's journey towards financial inclusion under the National Financial Inclusion Strategy and Roadmap (2015 – 2021) delivered some notable success. It reduced financial exclusion amongst adults by 6%, increased access to more than one financial product by 7%. Subsequent to this, the country launches the Botswana National Financial Inclusion Strategy and Roadmap (NFIS) 2024 – 2030. NFIS is expected to contribute to the achievement of sustainable and inclusive economic growth in Botswana, support job creation through inclusion of all players in the economy; particularly the easily excluded segment of the population such as women, youth and SMEs. To this end, the following recommendations have been adopted by Botswana under the NFIS 2024 – 2030 roadmap:

1. Strengthening & Harmonization of Financial Inclusion Legal and Regulatory Framework such as Economic Inclusion Act;
2. Adoption of the Implementation Matrix/Roadmap and budget for the proposed interventions;
3. Integrating the budget for financial inclusion interventions within the National Development Plans and Private Sector budgeting cycles;
4. Government to facilitate the Private Sector to take the lead in innovating solutions for financial inclusion through policy development;
5. Development of a comprehensive insurance cover;
6. Development of a National Payment Switch; and
7. Strengthening of Financial Literacy



Republic of The Gambia (Gambia)

The Gambia is the smallest non-island country located in West Africa. It runs a multiparty republic with one legislative house called the National Assembly. With an estimated total population of 2.76 million, Gambia has Banjul as its capital city and the Dalasi (D) is the national currency. The Gambia is mainly agrarian economy. Peanuts (groundnuts) constitutes the country's main agricultural export commodity. It has other subsistence crops such as rice, tomatoes, cassava, and yams as well as livestock such as cattle and goat. Due to its small coast line, the does not do major fishing like most of the coastal West African countries.

In 2022, the government, through the Central Bank of The Gambia and with the help of the Alliance for Financial Inclusion (AFI), launched its first National Financial Inclusion Strategy (NFIS). NFIS, is aimed at ensuring financial access to at least 70 percent of adults by 2025; particularly the segment of the population that is likely to financially excluded such as women and

the youth. NFIS rests on three (3) pillars, which are Financial Innovation, Financial Literacy, and Consumer Protection.



United Republic of Tanzania (Tanzania)

Tanzania is an East African country with an estimated total population of 68.56 million people. Dodoma and the Tanzanian Shilling (TZS) are the capital city and national currency of Tanzania respectively. Politically, Tanzania has one legislative house called the National Assembly. Tanzania is an agrarian economy with coffee, cashew nuts and cotton as its main export commodities. It grows other crops such as corn (maize), rice, bananas, cassava, potatoes, millet, and wheat. Tanzania also has precious minerals such as gold (main mineral export), tin, and gypsum as well as natural gas, which was recently discovered.

The Tanzania National Financial Inclusion Framework (2023 – 2028) (or NFIF 3) is Tanzania's third financial inclusion framework; it follows the National Financial Inclusion Framework (2014-2016) and National Financial Inclusion Framework (2018-2022). NFIF 3 is focused on expanding access and usage of affordable financial services and products amongst adults; especially those prone to being financially excluded like women (to close the persistent barriers and financial inclusion gender gap), the youth, and Micro, Small & Medium Enterprise (MSMEs). NFIF 3 has four (4) strategic objectives as follows:

1. Universal access to financial services and products;
2. Expand usage of a broad range of financial products and services;
3. Enhance quality of financial products and services; and
4. Enhance the financial welfare of individuals and businesses.

Under the NFIF 3, Tanzania's financial inclusion pathways are captured in three (3) phases:

Phase 1: Addressing Access Barrier,

Phase 2: Increase Usage of Financial Products and Services; and

Phase 3: Deepen Usage of Financial Services.



Republic of Kenya (Kenya)

Kenya is located in East Africa and follows a multiparty republic with two legislative houses (called the Senate and National Assembly). With an estimated total population of 56.43 million, the capital city of Kenya is Nairobi and the Kenyan Shilling (K Sh) is the national currency. Kenya is blessed with enormous landscape and wildlife (such as lions, elephants, rhinoceros, hippopotamuses, and cheetahs), which attracts significant tourism into the country. Tea, fresh flowers, cotton, and coffee are some of the highest foreign currency earners for Kenya. Kenya also produces other crops such as corn (maize) and wheat as well as cattle (for beef and dairy products like milk, cheese, and butter) & goat. Kenya mines significant amounts of Soda ash as its main mineral export.

Digital financial inclusion; mostly driven by the mobile financial service (MFS), has become a key part of Kenya's journey towards financial inclusion in recent years. MFS involve the use of mobile phones to receive and send money as well as make payments. It has become popular because it is less expensive compared to the formal financial service (Van Hove & Dubus, 2019). M-PESA, which was launched in 2007, transformed Kenya's MFS and has become a template for other African countries and regulators that venture into the mobile financial services industry.



Federal Republic of Nigeria (Nigeria)

Nigeria is a Muslim-majority West African country is the estimated to be the most populous African country with a total population of 232.7 million people. The capital city of Nigeria is Abuja and the Nigerian Naira (₦) is its national currency. Nigeria runs federal republic with two legislative houses, which are the Senate and the House of Representatives. The country is bordered at the North by Niger, east by Chad and Cameroon, Benin on its west, and the Gulf of Guinea to the South. Nigeria has a tropical climate and rich in natural resources (both renewable and non-renewable) in significant commercial quantities. These include but not limited to petroleum products/crude oil, natural gas, coal, precious minerals, forestry/agricultural products, fisheries, etc. The economy of Nigeria is mainly based on petroleum products, agricultural products/crops (such as cocoa, palm oil, corn, rubber, cassava, and kola nuts,), livestock/animal product (such as cattle, sheep and goat), amongst others.

Nigeria has a vibrant financial system, which is dominated by the banks (managed by the Central Bank of Nigeria), insurance institutions, the stock exchange market, and securities exchange commission. Over the past 10 years, Nigeria has witnessed growth in the level of financial inclusion in the country and achieving greater levels of to access to finance remains a key focus for Nigeria. To this end, the Central Bank of Nigeria and the National Financial Inclusion Governance Committees have introduced various policy interventions; notably the National Financial Inclusion Strategy (NFIS 3.0), which is aimed at increasing the level of financial inclusion in the country. Nigeria also a National FinTech Strategy, Strategy for Leveraging Agent Networks (to drive women's financial inclusion), and Payment System Vision 2025 to support and improve the level of financial inclusion on all fronts.

Republic of Mozambique (English) or República de Moçambique (Portuguese)



Mozambique is former Portuguese colony located in southeastern part of Africa; with an estimated total population of 34.63 million. It is a multiparty republic with a single legislative house called the Assembly of the Republic. Maputo is its capital city and the Metical (MTn) is the national currency. Mozambique has a tropical climate, biologically diverse and is rich in natural resources. Though significant portion of the population is employed in agriculture (mostly in family farming operations), the agricultural produce only forms small percent of the country's gross domestic product. Mozambique's main crop include cassava, corn (maize), beans, rice, and peanuts (groundnuts). The country also has high-quality iron ore, gold, bauxite, graphite, marble, manganese, uranium, and a rare mineral like tantalite.

The new National Financial Inclusion Strategy (NFIS) 2025–2031, which was officially rolled out on the 6th of August, 2025, replaced the previous edition (NFIS 2016 – 2022) as Mozambique's framework in its journey towards greater financial inclusion. Amongst other things, NFIS 2025 – 2031 focuses on digitalization of financial services and the promotion of green finance to expand access to financial services and ensure sustainable inclusion for individuals and households that are likely to be financially excluded. To this end, NFIS 2025 – 2031 rests on four (4) key pillars:

1. Expanding Access to Financial Products and Services;
2. Increasing the Use of Affordable and Quality Financial Products and Services;
3. Promoting Financial Literacy; and
4. Strengthening Consumer Protection and Confidence in Financial Services



Republic of Cameroon

Cameroon that is located in West Africa. It is a multiparty republic with two legislative houses (the Senate and the National Assembly). Cameroon has an estimated total population of 29.12 million. Yaoundé is the capital city of Cameroon and the CFA franc is its national currency. Cameroon is one of the world's largest producers of cocoa. Coffee and cotton are the other leading agricultural export for the country whilst such as plantain, potatoes, oil, beans, yams, and millet.. form key subsistence crops for the country. Cameroon has many natural resources including kyanite, cobalt, and bauxite.

The National Strategy for Inclusive Finance 2023-2027 (NSIF) is the Cameroon's anchor intervention to improve the level of financial inclusion in the country. The main objective of NSIF (2023 – 2027) is to ensure that at least 65% of Cameroon's adult population have access to and usage of affordable financial products and services within five (5) years; particularly segments of the population like women, the youth, MSMEs, rural dwellers, and other socially vulnerable groups (SVGs).



Kingdom of Lesotho (Lesotho)

Lesotho is small independent landlocked African country. It is entirely located within South Africa and has an estimated total population of 2.337 million. It is a constitutional monarchy with two legislative houses; the Senate and the National Assembly. Lesotho is mainly rural with Maseru and the Loti (M) being the capital city and national currency respectively. Apart from water, the country does not have any natural resource in significant commercial quantities to support citizens so the country relies heavily on support from South Africa. In addition, inward remittances (from

family members living abroad) constitute a significant portion of Lesotho's gross national product. Only a small portion of Lesotho land is arable but majority of the population, which is mostly rural, engage in subsistence farming in crops such as corn, wheat, beans, and sorghum as well as cattle products and wool for export. Lesotho also has diamond and uranium in small quantities.

Like other countries, Lesotho sees financial inclusion as a tool that can lead to economic growth, poverty reduction, and resilience building. To this end, Lesotho has rolled the National Financial Inclusion Strategy 2024–2028 (NFIS II) as the main strategic intervention to promote financial inclusion in the country. NFIS II builds on the previous edition; NFIS (2017–2017), and has the following strategic priorities:

1. Financial literacy and consumer protection;
2. Financial products for MSMEs and farmers;
3. Digitization and financial service expansion, and
4. An enabling regulatory environment and collaboration.

NFIS II also aligns with regional initiatives; including the South African Development Community (SADC) Strategy for Financial Inclusion and SME Access to Finance 2023–2028.

Burkina Faso



Burkina Faso is a landlocked former French colony located in West Africa; formerly known as the Republic of Upper Volta until 1984. It has an estimated total population of 23.55 million. Ouagadougou is the capital city of Burkina Faso. Burkina Faso, which is currently under transitional military regime, is an agrarian economy with the cotton, shea nuts, sugarcane, and sesame produced for their main agricultural exports. It also raises livestock such as cattle, sheep,

pigs, guinea fowl, and goat for export. Burkina Faso is rich in natural resources such as manganese and gold (that generate the main foreign exchange revenue for the country) as well as nickel, bauxite, zinc, lead, and silver in moderate quantities.

Burkina's Faso Financial Inclusion Roadmap seeks to enhance credit availability and provision broaden the use of Digital Financial Services (DFS), ensure availability and accessibility of agricultural finance, improve risk management options, and support environment and infrastructure

Republic of Uganda (Uganda)



Uganda is landlocked multiparty republic located in East Africa; with one legislative house (Parliament). With an estimated total population of 50.02 million, Uganda has Kampala as the capital city and the Ugandan Shilling (UGX) as the national currency. Uganda is geographically diverse with mountains, lakes (including Lake Victoria that attracts significant tourists), and volcanic hills. The country has rich biodiversity, wildlife and national parks that attract significant tourism, which helps the economy of Uganda. Uganda has moderate climate and fertile lands for farming and livestock. Though Uganda is predominately agrarian, it has many other natural resources such as untapped oil reserves and precious minerals such as gold (its major export) copper, cobalt, tungsten, and iron ore. Uganda is a democratic republic with multiparty system; elections have been held since 1980 to elect its leaders. Demographically, Uganda is mostly rural with a high youth population (around 75% of the population is below the age of 30 years).

Uganda is committed to ensuring that every adult is financially included. To this end, Uganda launched its first National Financial Inclusion Strategy (NFIS I) in 2017, which resulted in

significant progress in improving the level of financial inclusion (reducing financial exclusion) through encouraging access, usage amongst the adults and promoting the quality dimension of financial inclusion in Uganda. NFIS I was also focused on the the segment of the population most-prone to being financially excluded such as women, the youth, rural dwellers. Uganda has new roadmap for financial inclusion, which is anchored by the National Financial Inclusion Strategy 2023-2028 (NFIS II). NFIS II has five (5) objectives, namely to reduce financial exclusion and access barriers to formal financial services, to deepen and broaden the usage of quality and affordable formal financial products, to strengthen financial consumer protection and financial literacy, to develop an inclusive green finance market, and to promote gender-inclusive finance. Key enablers in the NFIS II policy framework include: (i) Public and private sector commitment and coordination; (ii) Policy, legal, regulatory, and supervisory capacity; and (iii) Enabling infrastructure capacity and security.

Democratic Republic of the Congo



Democratic Republic of the Congo (DRC) is a unitary multiparty republic with two legislative houses (Senate and National Assembly) located in Central Africa. DRC has an estimated total population of 109.3 million. Kinshasa is the capital city and Congo franc (FC) is the official currency. DRC is rich in natural resources such as copper and diamond, which constitutes its main export revenue. In addition, DRC grows agricultural crops like coffee (main export produce), palm oil, rubber, corn, rice, sweet potatoes, and cotton as well as animal husbandry. The literature report that DRC is the process of formulating a national financial inclusion strategy (NFIS) at the moment.



Republic of Rwanda (Rwanda)

Rwanda is a landlocked country located in East-Central Africa with an estimated total population of 14.26 million. Kigali is the capital city and Rwandan franc (RF) is the official currency. Rwanda follows a is multiparty republic with two legislative houses (Senate and Chamber of Deputies). It is an agrarian economy, which growa beans, sorghum, bananas, corn, potatoes, and cassava for its major exports. Rwanda's primary mineral resources include tin, tungsten, tantalite, and gold.

The National Bank of Rwanda (NBR) plays a key role in Rwanda's financial inclusion agenda. To this extent, the NBR has launched a financial inclusion dashboard (updated weekly) to generate and provide timely insight into the state of financial inclusion in the Rwanda. The dashboard tracks and reports micro-level financial indicators such as transactional and deposit accounts, savings, credit, and insurance, as well as information on the different channels used to access these financial services. Further, the dashboard provides granularly details that can be filtered by gender, age, institution, type, and location.



Republic of Madagascar (Madagascar)

Madagascar is an island country; located off the southeastern coast of Africa, with an estiated total population of 31.96 million people. It is made of the Island of Madagascar and other smaller islands. Madagascar is the fourth largest island in the world and located in the Indian Ocean. It is republic with two legislative houses (National Assembly and Senate). Antananarivo is the capital city and Ariary (MGA) is the official currency. Madagascar is rich in ilmenite (titanium ore), chromite, copper, cobalt, iron, coal, and nickel.

Madagascar's national financial inclusion agenda pivots on the following:

Strategic Axis 1: Financial education and consumer protection;

Strategic Axis 2: Access and use of financial services; and

Strategic Axis 3: Strengthening of the political, legal, regulatory and institutional framework.

2.1.3 Dimensions of Financial Inclusion

The existing literature suggest that financial inclusion is a multidimensional concept, hence, best captured as a index (Cámara & Tuesta, 2014; Cámara & Tuesta, 2017; Triki & Faye, 2013; Tsouli, 2022). Thus, recent studies have used various dimensions to construct a financial inclusion index (Cámara & Tuesta, 2014; Cámara & Tuesta, 2017; Triki & Faye, 2013; Tsouli, 2022). The following section discusses the widely used dimensions of financial inclusion.

2.1.3.1 Access Dimension

This refers to the physical proximity, avenues or channels (both human and machine interventions) that that economic agents are able to access financial services and products. (Ho, 2023; Triki & Faye, 2013). Examples include bank or insurance branches and agents, Point-of-sale (POS) devices, Automated Teller Machine (ATM), Automated Deposit Teller (ADT), other channels such as agencies, partner banking and insurance agents, amongst others.

2.1.3.2 Usage Dimension

This refers to the actual consumption of financial products and services by economic agents, which includes the regularity, frequency, and duration of usage of the financial services (Chakravarty & Pal, 2010; Ho, 2023; Nguyen & Du, 2022; Sarma, 2008, 2012; Triki & Faye, 2013). Examples include number of insurance policies and annual premiums paid on life insurance, average bank

account balances, number of transactions per account and credit facilities & overdrafts limited taken with a financial institution, number of electronic payments made.

2.1.3.3 Quality Dimension

This refers to the whether or not financial goods and services meet the needs of economic agents or consumers (Hannig & Jansen, 2010; Ho, 2023). Quality dimension depends on the quality of information provided by the financial institutions as well as the experiences of the economic agents who used the financial products and services in the past (Hannig & Jansen, 2010). Quality helps financial service providers to improve their financial goods and services offerings (Hannig & Jansen, 2010; Ho, 2023). Therefore, because of the ever-changing tastes, preference, and needs of consumers, there is the need for continuous research and development to improve the quality dimension (Hannig & Jansen, 2010; Ho, 2023). Also, there is the need for frequent customer feedback surveys to understand client experiences to help improve the quality dimension (Hannig & Jansen, 2010; Ho, 2023). Examples of the quality dimension are transparency, convenience, and affordability.

2.1.3.4 Barrier Dimension

Barriers refer to the factors that prevent or discourage economic agents from accessing the financial sector (Cámara & Tuesta, 2014). Barriers are viewed as drivers of financial exclusion and consist of voluntary or self-exclusion and involuntary exclusion (Cámara & Tuesta, 2014). Examples of the barrier dimension include indicators such as the required minimum account opening deposits, lack of trust in the financial system, high account and insurance maintenance costs (cost of financial services such as interest charged on credit, insurance premiums, and service fees of financial products), documents required by the financial system (such as documents

required to open an account, sign-up to life insurance, and take up a pension), lack of knowledge of financial services and products (financial literacy), days it takes to process insurance claims and bank loans (Cámara & Tuesta, 2014; Yoshino & Morgan, 2016).

2.1.4 Measurement of Financial Inclusion

Like defining financial inclusion, there is no consensus on how to measure financial inclusion (Nguyen, 2020; Park & Mercado, 2021). In the past, some studies measured financial inclusion as either a single indicator, a set of indicators or using proxies (Cámara & Tuesta, 2014; Cámara & Tuesta, 2017; Demirgüç-Kunt et al., 2020; Nguyen, 2020; Park & Mercado, 2021). More recently, however, financial inclusion has been identified as a broad concept or multi-dimensional, hence, measured as an index rather than as a single indicator (Cámara & Tuesta, 2014; Cámara & Tuesta, 2017; Demirgüç-Kunt et al., 2020; Nguyen, 2020; Nsiah & Tweneboah, 2023; Park & Mercado, 2021; Sarma, 2012; Triki & Faye, 2013). To this end, recent studies have constructed indices using various dimensions (some of which have been discussed above) to represent financial inclusion (Ahamed, 2016; Cámara & Tuesta, 2017; Gupte, Venkataramani, & Gupta, 2012).

2.2 Review of Theoretical and Empirical Literature

Previous studies have attempted to study financial inclusion using various economic theories but developments in economics and finance (particularly the ever-evolving nature of financial systems as well as recent innovations and developments in the financial systems) suggests that further studies are still required in the area. This section, therefore, discusses both the theoretical and empirical literature relating to the concept of financial inclusion, its measurements, and factors that drive financial inclusion.

2.2.1 Review of Theoretical Literature

2.2.1.1 The Systems Theory of Financial inclusion

The systems theory of financial inclusion holds that success in financial inclusion will depend on the performance of the existing sub-systems; namely economic, the social and the financial system, that financial inclusion relies upon (Abdulai & Issahaku, 2024; Ozili, 2020b; Ozili, Lay, et al., 2023). That is financial inclusion and sub-systems are interdependent such that a change in the sub-system impacts the level of financial inclusion in an economy (Ozili, 2020b). This means improvement in financial inclusion will improve the sub-systems financial inclusion relies on and the efficiency and effectiveness of the sub-systems will define the success or failure of financial inclusion in an economy (Ozili, 2020b).

The systems theory of financial inclusion is critical to this study because of a number of reasons. First, theory provides an understanding on how the existing sub-systems (economic, social, and financial systems) influence or drive the level of financial inclusion in an economy and vice versa. Thus, this will help to provide theoretical foundations for the determinants of financial inclusion in Africa. For instance, a well-performing financial sector improves the economic systems, which contributes to improved economic growth (Kim, Yu, & Hassan, 2018; Nizam, Abdul Karim, Sarmidi, & Abdul Rahman, 2020; Ozili, 2020b; Ozili, Lay, et al., 2023; Zins & Weill, 2016). Also, improvements in the level of financial inclusion improves the performance of the financial system, which ultimately improves the level and efficiency of the financial intermediation function of the financial system (Abdulai & Issahaku, 2024; Ozili, 2020b; Ozili, Lay, et al., 2023). Second, the systems theory of financial inclusion provides a macro-level perspective on financial inclusion compared to other theories that focus on a micro-level perspective financial inclusion.

2.2.1.2 Theory of the Financial Sector and its Financial Intermediation Function

This theory suggests that finance plays an important role in the growth and development of an economy (Akinci, Akinci, & Yilmaz, 2014; Beck, Levine, & Loayza, 2000; Chandwani & Kulkarni, 2018; De Gregorio & Guidotti, 1995). The financial sector is the main provider of finance in an economy (Akinci et al., 2014; Beck et al., 2000; Chandwani & Kulkarni, 2018; De Gregorio & Guidotti, 1995). The financial sector (also called the financial system) is made of the financial institutions (financial intermediaries), which provide financial services, and the markets (the equity and bond markets) where financial instruments, securities or assets are traded (Allen & Santomero, 1997; Blum, Federmaier, Fink, & Haiss, 2002; Merton & Bodie, 1995; Stiglitz, 1998).

The financial sector performs a number of functions (Blum et al., 2002; Boot, Hoffmann, Laeven, & Ratnovski, 2020; Levine, 1997, 2005). These functions include but not limited to financial intermediation, allocating capital investments, disseminating information, facilitating trade, helping to diversify and manage risks, helping to mobilize and pool savings, and easing the exchange of goods and services (Ayadi & Ayadi, 2019; Blum et al., 2002; Chen, Doerr, Frost, Gambacorta, & Shin, 2023; Levine, 1997, 2005; Thakor, 1996; Thiel, 2001). The financial intermediation function is arguably the most significant role played by the financial sector in an economy (Allen & Santomero, 1997; Boďa & Zimková, 2021; Boot et al., 2020; Kwakye, 2012; Thiel, 2001). In fact, the significance of the financial intermediation process has been widely under-emphasised (Agyekum, 2017; Hannig & Jansen, 2010).

Financial intermediation is the process by which financial institutions bring together the surplus units (savers) and the deficit units (borrowers) of funds for investment and consumption in order to encourage economic transactions, investment and productive activities in every economy (Adu,

Marbuah, & Mensah, 2013; Agyekum, 2017; Bist, 2018; Boot et al., 2020; Chen et al., 2023; Kwakye, 2012; Levine, Loayza, & Beck, 2000; Minsky, 1961). The financial institutions are depository institutions (such as banks and savings and loans companies), insurance companies (life and non-life companies), pension funds companies, and investments banks (Danquah, Iddrisu, Quartey, Ohemeng, & Barimah, 2021; Kuada, 2019; Kwakye, 2012; Levine et al., 2000). The literature suggest that financial intermediaries exist due to the imperfections of the financial system so, for as long as these imperfections exist, financial intermediaries would exist (Gorton & Winton, 2003; Levine, 1997; Scholtens & Van Wensveen, 2003).

The theories of information asymmetry, transaction cost, and regulation underpin financial intermediation (Allen & Santomero, 1997; Bod'a & Zimková, 2021; Boot et al., 2020; Chen et al., 2023; Kwakye, 2012). In fact, without financial intermediaries, there would be information asymmetry and excessive transaction cost, which would negatively impact financial market players (Boot et al., 2020; Jiang, Sudhir, & Zou, 2021; Zeier Röschmann, 2018).

Information asymmetry is where one party has more or better information than the other party in the same financial transaction (Ahearne, Atefi, Lam, & Pourmasoudi, 2022; Allen & Santomero, 1997; Boot et al., 2020; Grassi, Lanfranchi, Faes, & Renga, 2022; Kwakye, 2012). Information asymmetry makes one party (ies) have an edge over the other party (ies) in a transaction because they disproportionately have more information to the same transaction(s) (Grassi et al., 2022). The presence of information asymmetry leads to information imbalance between surplus units and deficit units, insurers and policyholders/policy buyers (Beegle & Christiaensen, 2019; Einav & Finkelstein, 2011). Financial institutions help to lessen information asymmetry by collecting and

evenly sharing the information between financial market players (Ahamed & Mallick, 2019; Allen & Santomero, 1997; Boot et al., 2020; Gorton & Winton, 2003; Leland & Pyle, 1977).

The literature suggest that information asymmetry causes market imperfections, adverse selection, moral hazards, inefficiencies, and certain types of market failures (Degryse & Ongena, 2005; Hauswald & Marquez, 2006; Kwakye, 2012; Nouren, 2009). It can undermine the entire financial sector and ultimately hinder the fight for financial inclusion (Izquierdo & Tuesta, 2015; Leland & Pyle, 1977).

Adverse selection arises when the wrong party is chosen or is favoured over a good party to a financial transaction due to information asymmetry (Bessler, Drobetz, & Grüninger, 2011; Djankov, McLiesh, & Shleifer, 2007; Powell & Goldman, 2021). Example: a banks grants a credit facility to a bad loan applicant rather a creditworthy loan applicant or where an insurance company grants a generous insurance policy or plan (say lower premiums or high claims paid) to an insurance fraudster rather than a genuine applicant. Financial intermediation helps to address this issue by obtaining information of prospective borrowers/insure policy buyers and doing due diligence and scoring to eliminate the bad applicants or insurance fraudsters (Ioannidou, Pavanini, & Peng, 2022; Powell & Goldman, 2021). Moral hazard, on the other hand, refers to the situation where a financial service is sold to an applicant who applied for it for the wrong reason (Ioannidou et al., 2022; Powell & Goldman, 2021). Moral hazard can increase impairments (bad loans) for banks and insurance fraud for insurance companies (Ioannidou et al., 2022; Powell & Goldman, 2021). Financial intermediaries reduce the incidence of moral hazard because they build the skills, capability, and structures that help them to evaluate and screen bad applicants in a financial transaction (Saltzman, 2021).

Financial intermediaries help to overcome imperfect information such as moral hazard and adverse selection (Cohen & Siegelman, 2010; Cummins & Doherty, 2006; Ioannidou et al., 2022; Mol, Botzen, & Blasch, 2020). Both adverse selection and moral hazard tend to increase the cost/price of financial services.

Transaction cost is the money and time required by market participants to deal in the financial sector or to complete an exchange beyond the cost of the product/service itself (Benston & Smith, 1976; Scholtens & Van Wensveen, 2003). Transaction cost includes but not limited to the money and time spent in searching, exchanging, and monitoring financial goods and services between the financial sector players (Allen & Santomero, 1997; Benston & Smith, 1976; Cummins & Doherty, 2006; Hamdouni, 2011; Scholtens & Van Wensveen, 2003). The cost of getting and processing information to facilitate transaction and aid financial decision-making underscores the importance of financial intermediaries (Levine, 1997). By bringing financial sector players together, financial intermediaries help to reduce transaction cost (Boďa & Zimková, 2021; Hamdouni, 2011; Zeier Röschmann, 2018). Without financial intermediaries, economic agents would have to bear excessive transaction cost (Claessens & Perotti, 2005, 2007; Levine, 2005).

The role of financial intermediation in ensuring the efficient distribution of financial resource to improve productivity and overall economic growth is widely acknowledged in the existing literature (Di Tella, 2019; Gupte et al., 2012; Gurley & Shaw, 1960; King & Levine, 1993d; Muhoza, 2019). For example, banks accept deposits from surplus units and lend to deficit units who come to borrow. In this instance, the bank (financial intermediary) has helped to reduce the money and time that the respective surplus units (savers) and deficit units (borrowers) would have spent to seek each other. By offering insurance products and services through their wide network

of brokers and agents, insurance companies (financial intermediary) help customers save money and time they would have spent in the search process for insurance (Stricker, Wagner, & Zeier Röschmann, 2023; Zeier Röschmann, 2018).

A well-functioning financial sector (through an efficient financial intermediation) helps to reduce transaction costs, reduce information asymmetry, helps to spread, share or reduce risks financial sector players are exposed to (Boďa & Zimková, 2021; Hamdouni, 2011). Financial intermediation helps to lower transaction costs and make information available (that is reduce information asymmetry), which make financial services available, affordable, and accessible to economic agents (Beck, Demirguc-Kunt, & Martinez Peria, 2005; Demirguc-Kunt, Klapper, & Singer, 2017; Kwakye, 2012; Scholtens & Van Wensveen, 2003; Zeier Röschmann, 2018). Thus, the theory of financial intermediation is linked to financial inclusion (access to finance) because it ensures all economic agents are financially included (Allen et al., 2016; King & Levine, 1992; King & Levine, 1993c; Knight, 2013; Kwakye, 2012; Ozili, Lay, et al., 2023; Scholtens & Van Wensveen, 2003; Schumpeter, 1934; Stricker et al., 2023; Zeier Röschmann, 2018).

The existing literature suggest that financial inclusion (access to finance) leads economic growth, poverty reduction, and reduction in income inequality (Agbloyor, Gyeke-Dako, Kuipo, & Abor, 2016; Holloway, Niazi, & Rouse, 2017; Hunt & Samman, 2016; Kairiza, Kiprono, & Magadzire, 2017; Koomson et al., 2020c; Le, Chuc, & Taghizadeh-Hesary, 2019; Nizam, Karim, et al., 2020; Odo, BigBen, Agbi, & Anoke, 2016). There is a need for proper regulation of the formal financial sector to ensure it is operating transparently and sustainably to increase public confidence in sector so as to encourage patronage of the financial sector by economic agents; particularly amongst

households and vulnerable individuals who are prone to being financially excluded, and ultimately improve financial inclusion (Pal et al., 2021; Park & Mercado Jr, 2018).

2.2.1.3 Solow–Swan Neo-Classical Exogenous Theory

The Solow–Swan (neo-classical) theory of economic growth is one of the theories economists have used to explain economic growth (Agbloyor, Abor, Adjasi, & Yawson, 2014). Solow-Swan's theory holds that economic growth emanates from three (3) assumption; that is investments (savings and capital), workforce (labour) and technological progress (Sharipov, 2015; Solow, 1956). These assumption are closely linked and they interact with each other (Sharipov, 2015; Solow, 1956). The level of capital concentration in an economy is dependent on the rate of savings, which implies that there is a direct relationship between the rate of savings and capital concentration (Agbloyor et al., 2014; Engelbrecht, 1999; Sharipov, 2015; Solow, 1956). So, as savings increase, the capital available for productive activities within the economy also increases and vice versa (Agbloyor et al., 2014; Engelbrecht, 1999; Sharipov, 2015; Solow, 1956).

The Solow-Swan theory provides a sound theoretical foundation for this study because it explains the (financial inclusion) and economic growth relationship (Agbloyor et al., 2014; Agbloyor et al., 2016; Barro, 2003). For instance, investments, savings and capital must be equitably redistributed amongst economic agents by the financial sector and channeled into productive sectors to generate the needed economic growth, hence, there is a link. The direction of the link is, however, inconclusive and various scholars have found different directions of the finance-growth link.

2.2.2 Review of Empirical Studies

This section reviews empirical literature related to financial inclusion and the factors that driver financial inclusion.

Empirical studies on the factors that financial inclusion; particularly in Sub-Saharan Africa, is still at early stages (Aterido et al., 2013; Bashiru et al., 2023; Nsiah & Tweneboah, 2023; Wokabi & Fatoki, 2019). The literature suggests financial inclusion can be determined from both demand-side and supply-side factors (Aterido et al., 2013; Fahmy & Ghoneim, 2023; Ifediora et al., 2022; Kandari, Bahuguna, & Salgotra, 2021; Nguyen & Luong, 2023; Njenga & Irungu, 2024; Nsiah & Tweneboah, 2023; Uddin, Chowdhury, & Islam, 2017).

- **Demand-sided factors that influence financial inclusion**

Demand-side factors are drivers of financial inclusion from the perspective of the consumers of financial services; including households and businesses (Nsiah & Tweneboah, 2023). Demand-side factors include socio-economic variables such as gender, religion, age, income levels, educational background, literacy level, marital status, and urban or rural demographics (Allen et al., 2016; Asuming, Osei-Agyei, & Mohammed, 2019; Bashiru et al., 2023; Bekele, 2023; Gautier, Luc, & Djimoudjiel, 2020; Koomson & Danquah, 2021; Njenga & Irungu, 2024; Yangdol & Sarma, 2019; Zins & Weill, 2016).

Zins & Weill (2016) found that factors such as gender and educational and income influenced the level of financial inclusion across 37 African countries. Yangdol and Sarma (2019) found evidence to suggest that gender (being a woman), unemployment, being poor, and lacking education tend to be negatively associated with financial inclusion whilst individuals or households with better education and income tend to be financially included. The study by Bekele (2023) used the demand-side approach to study determinants of financial inclusion in Kenya and Ethiopia at both the micro and macro levels. They found that socio-economic factors such as gender, employment

status, and owning a mobile phone have significant effect on financial inclusion whilst lack of money was a hindrance to financial inclusion in the the two countries.

The empirical literature also identifies that age drives the level of financial inclusion in an economy (Allen et al., 2016; Koloma, 2021; Nsiah & Tweneboah, 2023). To this end, recent empirical studies have suggested that age has a direct relationship with financial inclusion (Allen et al., 2016; Gautier et al., 2020; Rashdan & Eissa, 2020). This means that an individual's participation in financial sector increases with age. Allen et al. (2016) argue that age was a factor in financial inclusion when they found that the youth were prone to being financially excluded compared to adults. To investigate the determinants and barriers of financial inclusion India, Dar and Ahmed (2020) deployed the probit model and found that amongst other factors, age had a positive relationship with financial inclusion. Rashdan and Noura (2020) and Gautier et, al. (2020) found evidence to support direct relationship between the level of financial inclusion and age of individuals in Egypt and Cameroun respectively.

The literature futher suggest that other factors such as educational background, gender, the family status of the youth, and employment status can influence the relationship between age and financial inclusion (Koloma, 2021; Senou & Manda, 2022). Using logit estimations to investigate the factors that drive the level of financial inclusion and entrepreneurship amongst the youth in Mali, Koloma (2021) found the youth were mainly financially included if they were educated, employed, and came from wealthy families (particularly when at least a family member owned an account) compared to the youth who did not have same privileges.

Recent studies suggest that geographical location influence financial inclusion (De Ollouqui, Andrade, & Herrera, 2015; Wokabi & Fatoki, 2019; Yorulmaz, 2016). Studies have found that challenges to financial inclusion are predominant in rural areas (De Ollouqui et al., 2015; Wokabi & Fatoki, 2019; Yorulmaz, 2016). Allen et al. (2016) found that living in rural communities made individuals and households more financially excluded compared to living in urban areas. Bashiru et al. (2023) also found that locational factors like rural population growth negatively impacted the level of financial inclusion amongst the countries within the sub-Saharan African region. Wokabi and Fatoki (2019) found that population growth tended to negatively impact the level of financial inclusion in East Africa.

In respect of gender, recent studies have found various evidence to suggest that gender plays a significant role in determining the level financial inclusion of financial inclusion in an economy (Demirgüç-Kunt et al., 2013; Mohammed et al., 2017). At the micro level, Ghosh and Vinod (2017) found that the probability of financial exclusion is high in female-dominated households and amongst families with women as head of household. The study found that these families were more prone to not owning bank accounts, access cash and credit facilities compared to male-dominated families or families with men as heads of the household. Mohammed et al. (2017) found evidence to the suggest women were more susceptible to being financially excluded compared men. Similarly, Demirgüç-Kunt et al. (2013) found that men disproportionately owned bank account compared to women; particularly due to factors such as discriminatory practices against women and early marriage amongst women, compared to men in developing countries.

Other studies have also attributed income levels and employment status (employed and unemployed) to financial inclusion in an economy (Altarawneh, Al-Nuaimi, & Al-Nimri, 2020;

Badar et al., 2020). Using multinomial logistic regression to estimate the determinants of financial inclusion, Badar et al. (2020) found evidence to suggest that being employed promoted the level of financial inclusion in India, Pakistan and Bangladesh compared to being unemployed. To investigate the determinants and barriers of financial inclusion India, Dar and Ahmed (2020) used the probit model and found that earning capability is directly related with financial inclusion.

- **Supply-sided factors that influence financial inclusion**

The supply-side determinants of financial inclusion come from the financial services providers' perspective (Adil & Jalil, 2020; Bashiru et al., 2023; Célerier & Matray, 2019; Njenga & Irungu, 2024; Nsiah & Tweneboah, 2023; Wokabi & Fatoki, 2019). The supply-side approach use financial institutions factors such as insurance and banking sector infrastructure, number of ATM and insurance/bank branches (Njenga & Irungu, 2024). Supply-side determinants can be both from within and from outside the country (Nsiah & Tweneboah, 2023).

The existing literature suggest that the most common supply-side determinant of financial inclusion is existence of financial institutions who offer appropriate financial services products and services to consumers (Adil & Jalil, 2020; Allen et al., 2016; Asuming et al., 2019; Bekele, 2023; Chikalipah, 2017; Ifediora et al., 2022; Kandari et al., 2021). Thus, factors such as greater the size, geographic outreach (greater proximity to financial intermediaries) and demographic outreach of financial institutions help to improve the level of financial inclusion in an economy (Kandari et al., 2021; Nsiah & Tweneboah, 2023). Using the autoregressive distribution lag (ARDL) method, Adil and Jahil (2020) found that the level financial inclusion improved in line with growth the size of the banks and geographical reach of banks in Pakistan. This may be because with the increased geographical outreach (greater proximity to the banks), consumers and

households had more access to credit in Pakistan. Also, Mossie (2022) deployed the logit model and found evidence to support the argument that distance to financial access point impacted the level of financial inclusion in Ethiopia in Africa.

It must be emphasised that the availability of financial institutions and financial services alone does not guarantee that financial inclusion would improve within an economy (Kandari et al., 2021). The actual usage of the financial services is, therefore, crucial here (Kandari et al., 2021; Nsiah & Tweneboah, 2023). Using the binary logistic regression on 780 rural households, Kandari et al. (2021) found that factors such bank account ownership, availability of credit facilities and mobile banking access were important determinants of financial inclusion in rural India.

The existing literature also suggest financial deepening, financial innovations, and the availability of new and improved financial services and products are important drivers of financial inclusion (Agyekum, Locke, & Hewa-Wellalage, 2016; Agyekum, 2017; Chipeta & Muthinja, 2018; Laeven, Levine, & Michalopoulos, 2015; Morgan, 2022; Muthinja, 2016; Oyelami, Saibu, & Adekunle, 2017; Qamruzzaman & Wei, 2019). Financial innovations arise in order to reduce transaction costs for economic agents who consumer financial market products and services (Merton, 1989; Muthinja, 2016). To the end, financial innovation has the propensity to reduce transaction cost (lower costs) and address the issue of information asymmetry, which can ultimately help to improve financial inclusion (Chipeta & Muthinja, 2018; Chitimira & Warikandwa, 2023; Demirgüç-Kunt & Klapper, 2012; Laeven et al., 2015; Mossie, 2022). Financial innovations also make information easily available to financial market players, thereby, making the financial intermediation process efficient and easy to access (Broby, 2021).

Using the panel autoregressive distributive lag (ARDL) method, Oyelami et al. (2017) found that bank innovations such as ATMs helped to improve the level of financial inclusion in sub-Saharan Africa. Employing the panel autoregressive distributed lagged model (under a linear and nonlinear framework) and Granger-causality test with System GMM specification to test the directional causality, Qamruzzaman & Wei (2019) found that the relationship between financial innovation and financial inclusion was positive in Bangladesh, India, Pakistan, Nepal, Bhutan, and Sri Lanka in both the short-term and long-term. Demirgüç-Kunt & Klapper (2012) found that the use of the mobile money service (a commonly used proxy for financial innovation) resulted in lower transactions cost of financial services (cost of money transfer) for economic agents. Similarly, Mossie (2022) found that affordable financial services and products was an important driver of financial inclusion in Ethiopia. In a recent study, high cost of accessing financial services was found to discourage the use of the financial products and services (Mossie, 2022).

Other supply-side and regulatory factors that influence financial inclusion include trust and documentation requirements (Agyekum, 2017; Akudugu, 2013; Nsiah & Tweneboah, 2023; Sanderson, Mutandwa, & Le Roux, 2018; Xu, 2020). Examples include the onerous Know Your Customer (KYC) requirement for account opening and insurance product sign-up, stringent requirement to access a bank facility or lines of credit, and bottlenecks in making insurance claims. Sampling 1000 adults with different income levels, Akudugu (2013) found that documentation was a barrier financial inclusion. They found that people who did not have the required documentation were less likely to be financially included compared those who have the required documentation in Ghana. The study also found that lack of trust in the financial system worked against improving financial inclusion amongst individuals. Abel et al. (2018) found that stringent account opening requirements were a barrier to financial inclusion in Zimbabwe.

The World Bank's vision of universal financial access (UFA) is a central agenda in the drive towards ensuring that every adult is financially included (Chitimira & Warikandwa, 2023; Ho, 2023; Sharma & Changkakati, 2022; Swaiss, 2024). Under the universal financial access agenda, the gateway to financial inclusion provides a framework on how to move economic agents from being 'unserved' to being 'served' (World Bank, 2016). In fact, the gateway to financial inclusion framework highlights the fact that access to financial services like savings, credit, payments, insurance, and remittance are crucial to moving adults from being financially excluded to being financially included (World Bank, 2016). That means adults would be able to own account (to save and invest), access credit facility, transact, purchase in insurance policy, send and receive remittances (both locally and internationally) (World Bank, 2016). This means that any index that measures financial inclusion must include savings, credit, payments, insurance, and remittance to be representative. A review of literature shows that previous studies only used bank information (savings, credit, and payments) to construct their indices for financial inclusion, thereby neglecting insurance and remittance. Also, the financial sector is mostly made up of banks, insurance, and capital market so any financial inclusion index must cover these sub-sectors (at least majority) to be representative.

To address these limitations, this study makes several contributions. Firstly, rather than relying on proxies or individual indicators or dimensions, this study creates a multidimensional financial inclusion index. This approach enables the study to capture the multidimensional nature of financial inclusion. Furthermore, unlike previous studies that have solely relied on banking sector data to construct their financial inclusion indices, this study incorporates both bank and insurance data into the index, thus, offering a more holistic measure of financial inclusion. Finally, by using our more comprehensive index to analyse the determinants of financial inclusion, this study

provide a fresh perspective compared to prior studies that relied solely on banking data for their financial inclusion index. Overall, this approach offers a richer understanding of financial inclusion dynamics within the sub-Saharan African region compared to previous studies.

2.3 Data and Methodology

2.3.1 Data

Like recent studies on financial inclusion, this study adopted a quantitative approach to achieve the study objectives. To construct the financial inclusion index and to investigate the determinants of financial inclusion in Africa, this study followed recent approaches and econometric models with modifications based on the available dataset (Ahamed & Mallick, 2017; Cámara & Tuesta, 2014; Gujarati, Porter, & Gunasekar, 2012; Min, 2019; Nsiah et al., 2021; Sharma, 2016a, 2016b; Triki & Faye, 2013).

This study used secondary data collected from various credible sources for the estimations and analysis. These sources include: First, the World Development Indicators (WDI), which is a World Bank database that houses over 50 years of data on over 217 countries across the world. The WDI data is comprehensive and based on thematic areas such as poverty and inequality, economy, people, environment, states and markets and global links (Evans, 2016a; Nsiah et al., 2021). WDI are credible and provide a comprehensive dataset for any empirical study (Evans, 2016a). WDI were used by recent studies such as Evans (2016), Gnanangnon (2021), and Nsiah & Tweneboah, (2021). Second, the Financial Access Survey (FAS), which is an International Money Fund (IMF) dataset that provides macroeconomic and financial data. FAS offers data on access and use of financial services on over 189 countries (spanning over 10 years) and over 121 time series data (Espinosa-Vega et al., 2020; Inoue & Hamori, 2016). FAS provides a comprehensive and credible

data on financial inclusion because the IMF works with the central banks and other financial regulators of the respective countries to collect its data. Recent studies have used FAS data in studying financial inclusion (Espinosa-Vega et al., 2020; Inoue & Hamori, 2016). Data was collected from the United Nations Development Programme (UNDP).

The study sampled 14 African countries over a study period that spans between 2000 to 2021. The choice of sampled countries and study period was based on data availability. Unlike previous studies, this study used both bank and insurance data for constructing the financial inclusion index, thereby, significantly adding to the empirical literature. The study, however, excluded the capital market, which is part of the financial system, due to lack of sufficient data on the capital markets. There countries were Botswana, Burkina Faso, Cameroon, Congo DR., The Gambia, Kenya, Lesotho, Madagascar, Mozambique, Nigeria, Rwanda, Sierra Leone, Tanzania, and Uganda.

2.3.2 Financial Inclusion Index

Objective # 1 (a) of this thesis was devoted to constructing a more comprehensive financial inclusion index for Africa. To achieve this, the study used both banking and insurance information. This objective was motivated by the World Bank's Gateway to Financial Inclusion, which suggested that the availability of financial services such a savings, credit, make payment, insurance, and remittance to all economic agents is central to ensuring universal financial access across the world (Claessens, 2006; Ho, 2023). This study used data from both banking and insurance sectors to construct the financial inclusion index for Africa because it is more representative of the African financial sector rather than using only banking data to construct the index. Recent studies have used different dimensions (such as access, availability, usage, barriers, efficiency, and quality) in measuring or constructing their financial inclusion (Cámara & Tuesta, 2014; Sarma, 2008, 2012; Sharma, 2016a; Triki & Faye, 2013). This study, however, used depth,

access and efficiency dimensions for the financial inclusion index due non-availability of full complement of data for the other dimensions of financial inclusion (such as barrier and quality) for both banks and insurance industries for the sampled countries and study period.

Mathematical Models for Computing Financial Inclusion Index (FII)

This study followed recent studies by using the Principal Component Analysis (PCA) to construct the financial inclusion index for Africa (Ahamed, 2016; Ahamed & Mallick, 2017; Cámara & Tuesta, 2017). This is because the PCA approach offers a number of benefits to this study. First, it helps the study to adequately resolve the problems of multicollinearity and over-parameterization that using single measures to represent financial inclusion posed to previous researchers (Ahamed & Mallick, 2019; Cámara & Tuesta, 2014). Second, it helps to extract the common components in the dimensions (that is depth, access, and efficiency) that capture the different aspects financial inclusion and helps to eliminate the components of dimensions of financial inclusion that do not explain the variance in the dimensions of financial inclusion; that is to say it allows us to only use data that provide necessary information regarding the dimensions of financial inclusion being studied (Bali, Brown, & Caglayan, 2014; Cámara & Tuesta, 2014).

This study adopts the model specification (equation 2.1) used by Cámara & Tuesta (2017) below:

$$FII_i = w_1 Y_i^d + w_2 Y_i^a + w_3 Y_i^e + \varepsilon_i \quad (2.1)$$

Where:

FII represents financial inclusion index. Y_i^d , Y_i^a and Y_i^e are depth, access, and efficiency dimensions respectively. Depth (being private-sector credit to GDP, pension fund assets to GDP, mutual fund assets to GDP, life insurance premiums to GDP, and non-life insurance premium to GDP), access (being bank branches per 100,000 adults and ATMs per 100,000 adults), and

efficiency (being net interest margin, lending-deposits spread, non-interest income to total income, and overhead costs to total assets) represent the causal variables. w_i represents the weight and ε_i represents the error term.

Accordingly, we express the PCA method in the linear equations (2.2, 2.3, and 2.4) below

$$Y_i^d = \alpha_1 \text{Bank Credit}_t + \alpha_2 \text{Pension Funds}_t + \alpha_3 \text{Mutual Fund}_t + \alpha_3 \text{Insurance}_t + \mu_t \quad (2.2)$$

$$Y_i^a = \beta_1 \text{Branch branches}_t + \beta_2 \text{ATMs}_t + \epsilon_t \quad (2.3)$$

$$Y_i^e = \delta_1 \text{Interest margin}_t + \delta_2 \text{Lending – deposit spreads}_t + \delta_3 \text{non – interest income to total income}_t + \delta_4 \text{overhead costs to total assets}_t + \phi_t \quad (2.4)$$

Where d , a , and e represent depth, access, and efficiency dimensions respectively and μ , ϵ , and ϕ are error terms for equations (2.2), (2.3) and (2.4) respectively. Equations (2.2), (2.3) and (2.4) are estimated using principal components of the explanatory variables with joint estimation of the unobserved endogenous variables. In this study, we used Rp (pxp) to explain the correlation matrix of the P standardized indicators of each of the two dimensions used, λ_j ($j = 1, 2 \dots p$) was used to signify the j – th eigenvalue generated, where j represents the number of principal components and the number of indicators of P , and δ_j ($px1$) represented the eigenvector of the correlation matrix. In additions, $\lambda_1 > \lambda_2 > \dots \lambda_p$ represented Pk ($k = 1, 2 \dots P$) as the k – th principal component.

Equations (2.5), (2.6), and (2.7) identify the weighted averages of estimator of each of the dimensions used in this study as follows:

$$Y_i^d = \frac{\sum_{j,k=1}^p \lambda_j^d p_{ki}^d}{\sum_{j=1}^p \lambda_j^d} \quad (2.5)$$

$$Y_i^a = \frac{\sum_{j,k=1}^p \lambda_j^a p_{ki}^a}{\sum_{j=1}^p \lambda_j^a} \quad (2.6)$$

$$Y_i^e = \frac{\sum_{j,k=1}^p \lambda_j^e p_{ki}^e}{\sum_{j=1}^p \lambda_j^e} \quad (2.7)$$

Where:

$Pk = X\lambda_j$, X represents the indicator matrix whilst λ_j represents the variance of the $k - th$ weight.

We combining all the individual indexes estimate the parameter λ in equation (2.8):

$$FII_i = \frac{\sum_{j=1}^p \lambda_j p_{ki}}{\sum_{j=1}^p \lambda_j} \quad (2.8)$$

In equations (2.9), (2.10) and (2.11) below, we present each component Pki as a linear combination of the three dimensions used in this study as well as the respective eigenvectors of the correlation matrices:

$$P_{1i} = \pi_{11} Y_i^d + \pi_{12} Y_i^a + \pi_{13} Y_i^e \quad (2.9)$$

$$P_{2i} = \pi_{21} Y_i^d + \pi_{22} Y_i^a + \pi_{23} Y_i^e \quad (2.10)$$

$$P_{3i} = \pi_{31} Y_i^d + \pi_{32} Y_i^a + \pi_{33} Y_i^e \quad (2.11)$$

To obtain the financial inclusion index, we substitute the Pki in equations (2.9), (2.10) and (2.11) into equation (2.12):

$$FII_t = \frac{\sum_{j=1}^3 \lambda_j (\pi_{j1} Y_i^d + \pi_{j2} Y_i^a + \pi_{j3} Y_i^e)}{\sum_{j=1}^3 \lambda_j} \quad (2.12)$$

Equation (2.12) can be presented in a linear form as overall weighted average of financial inclusion index using equation (2.13) below:

$$FII_i = w_1 Y_i^d + w_2 Y_i^a + w_3 Y_i^e + e_i \quad (2.13)$$

FII represents financial inclusion index for Africa, w_1 , w_2 , and w_3 are the respective weights of each dimension used in the final financial inclusion index, and e_i represents the error term.

2.3.3 Determinants of Financial Inclusion in Africa

In order to answer research objective #1 (b), this study used the panel data model. This sufficiently captured the dynamic relationship between the factors that impact the degree of financial inclusion in Africa. To this to, this study adopted similar econometric models used in recent studies in the area (see Demirguc-Kunt, Klapper, & Randall, (2014); Laha, Kuri, & Kumar, (2011); Marshall, (2004); Mehrotra & Yetman, 2015; Naceur, Barajas, & Massara, (2017), and Nsiah et al., (2021)) and explanatory variables based on the existing literature (Mohieldin et al., 2011; Sarma & Pais, 2011) with modifications to suit data available and the African context.

Model specification

The study deployed the econometric model (see equation 2.14 below) to investigate the factors that determine financial inclusion in Africa:

$$\ln FII_{it} = \alpha + \beta_1 \ln FII_{it-1} + \beta_2 \ln GNI_{it} + \beta_3 \ln DCP_{it} + \beta_4 \ln MSP_{it} + \beta_5 \ln EDU_{it} + \beta_6 \ln DPR_{it} + \beta_7 \ln INF_{it} + \beta_8 \ln U2R_{it} + \varepsilon_{it} \quad (2.14)$$

Where FII, representing the financial inclusion index, is the dependent variable. The independent variables are: GNI representing economic growth, DCP representing financial depth, MSP representing money supply, EDU representing education, DPR representing dependency ratio, INF representing inflation and U2R representing urbanisation. The variables are explained below:

Dependent Variable

- **Financial Inclusion**

Financial inclusion is represented by the financial inclusion index (FII) constructed using both bank and insurance data of the sampled countries in the study. The literature suggest that access to

finance (inclusive financial access) is critical to inclusive growth and development of an economy (Ofosu-Mensah Ababio, Attah-Botchwey, Osei-Assibey, & Barnor, 2021; Triki & Faye, 2013). Financial inclusion helps in wealth accumulation and improve the well-being (reduce income inequality and the prevalence of poverty) amongst economic agents (Park & Mercado, 2015; Park & Mercado, 2021; Tsouli, 2022).

Explanatory Variables

- **Gross National Income**

Gross National Income (GNI) per capita is a widely used proxy for economic growth; often used to measure the wealth of a country (Bozkurt, Karakuş, & Yildiz, 2018; Nsiah & Tweneboah, 2023; Nsiah et al., 2021) For this study, GNI is measured as the sum of value added by all resident producers together with any product tax that is not included in the valuation of output in addition to net receipts of primary income from abroad (Nsiah & Tweneboah, 2023; Nsiah et al., 2021). The hypothesis is that as GNI grows, all things being equal, income of the economic agents (particularly individuals and households) is expected to grow as well, which will enable the individuals and households to patronize the financial products and services and be financially included. Park and Mercado (2015) suggested that involuntary financial exclusion in Asia may be driven largely by insufficient disposable income for individuals and households.

- **Financial Depth**

Similar to recent studies, this study used domestic credit to the private sector (DCP) to GDP as proxy for financial depth (Agyekum, 2017; Nsiah et al., 2021; Siddik & Kabiraj, 2018). DCP refers to the financial resources such as loans, trade credits, account receivables, and guarantees that are advanced to the private sector by financial institutions (Agyekum, 2017). The private sector plays an important role in the development process of any economy (Agyekum, 2017; Evans, 2016a;

Olowofeso, Adeleke, & Udoji, 2015). They provide employment to individuals who earn income, which increases their propensity to participate in the financial sector and be financially included (Evans, 2016a, 2016b; Nsiah & Tweneboah, 2023). The private sector also pays taxes, which the government uses to improve economic growth and create an enabling business environment to help businesses thrive and be able to employ more individuals and keep individuals employed to receive income and be able to participate the financial sector (Agyekum, 2017; Leita, 2012).

- **Money Supply**

Money supply (MSP) refers to total sum of money that is in circulation within economy (Agyekum, 2017; Evans, 2016b). The WDI defines broad money as the sum of currency outside banks; demand deposits other than those of the central government; the time, savings, and foreign currency deposits of resident sectors other than the central government; bank and traveler's checks; and other securities such as certificates of deposit and commercial paper (Agyekum, 2017). All other things being equal, an increase in money supply signals more money in circulation/improved purchasing power of economic agents in the economy, which can increase the demand/consumption of economic agents (Nsiah & Tweneboah, 2023). The demand for goods and services would encourage businesses to increase supply (by producing more goods and services) to meet the demand from consumers, which would increase employment for individuals and households as well as result in increased business for other businesses in the value chain in the economy. Being employed and earning income would encourage economic agents to be financially included; such as own a bank account, buy an insurance policy (such as life policy), and access a credit facility from a financial institution. The increased business would also enable businesses seek credit facility/investment from the financial sector, which they can deploy into the business/productive venture to generate more income and spur business growth. Economically,

therefore, it is expected that an increase in money supply will influence growth due to its ability to increase investment (Galadima & Ngada, 2017). In line with previous studies, this study hypothesised that increases in money supply would impact economic growth, which will result in the ability of economic agents to participate in the formal financial sector (Chaitip, Chokethaworn, Chaiboonsri, & Khounkhalax, 2015; Galadima & Ngada, 2017; Iorember, Jelilov, Alymkulova, & Yua, 2022; Mahara, 2020; Nsiah & Tweneboah, 2023).

- **Education**

The literature suggest that education is an important instrument that can be used to fight against the prevalence of poverty amongst individuals/households (Awan, Malik, Sarwar, & Waqas, 2011; Hofmarcher, 2021). Education improves employability of individuals and cause them to be employed and/or receive higher income, which increases their disposable income and ability to participate in the financial sector (Dar & Ahmed, 2021; Zins & Weill, 2016). Education also makes individuals (and households) appreciate the importance of the financial sector in their lives, which causes them to be open to participating in the financial sector (Allen et al., 2016; Khan, Siddiqui, & Imtiaz, 2022; Morgan & Long, 2020). For this study, education (EDU) is expressed as a ratio of gross secondary school enrolment and the total population, regardless of the age. Similar to recent studies, this study expected education to have a positive relationship with the level of financial inclusion in Sub-Saharan Africa (Dar & Ahmed, 2021; Zins & Weill, 2016).

- **Dependency Ratio**

For this study, dependency ratio (DPR) refers to the number of dependent individuals relative to the number of the active individuals in work force within an economy (Nsiah & Tweneboah, 2023; Park & Mercado Jr, 2018). The study follow how WDI measured dependency ratio as the proportion of senior citizens (65+) to working-age citizens (15–64) multiplied by a hundred (Uddin

et al., 2017). The theoretical literature suggest that a higher dependency ratio leads less disposable income available to individuals and households, which reduces their savings rate and limits their ability or propensity to engage the formal financial sector (Nsiah & Tweneboah, 2023; Uddin et al., 2017). The dependency ratio is expected to reveal a negative relationship with financial inclusion since the less dependents one has, the more income to participate in the financial sector (Park & Mercado, 2018; Uddin et al., 2017).

- **Inflation**

Inflation (INF) is generally defined as the persistent rise in the general price of goods and services over time. It is derived using the consumer price index, which indicates the average cost of a basket of goods and services in percentage terms over time at predefined intervals. Inflation is the year-on-year change in consumer price index (Park & Mercado Jr, 2018; Tsouli, 2022). Similar to recent studies, this study used the consumer price index to represent inflation in Africa (Cámara & Tuesta, 2014; Nsiah & Tweneboah, 2023). Rising inflation tend to causes general price level to rise, which reduces the amount of goods and services individuals and households can buy or afford; particularly if the rise of their income level is not equal or higher than the rate of inflation (Ndoricimpa, 2017; Tsouli, 2022), and reduces economic growth (Ndoricimpa, 2017). Therefore, the study expected that higher inflation inhibits individuals and households participation in the formal financial sector whilst lower inflation would encourage individuals and households to use the financial sector (Omar & Inaba, 2020a; Park & Mercado Jr, 2018; Tsouli, 2022).

- **Urbanisation**

To provide evidence of the geographical aspects of financial inclusion, this study introduced urbanisation (urban to rural population ratio) as variable (Cicchello et al., 2021; Demirguc-Kunt, Klapper, Singer, & Ansar, 2018; Leyshon & Thrift, 1995). As regions open-up or become

urbanised, there is more development and growth in those areas. There is growth in business and jobs are created, which provide more disposal income to individuals and households to enable them participate in the financial sector. Also, urbanisation tends to attract more financial institutions to set up branches in these regions, which creates ease of access to financial services for individuals and households in the regions (Cicchello et al., 2021; Demirci-Kunt et al., 2018; Koomson, Annim, & Peprah, 2016; Koomson, Koomson, & Abdul-Mumuni, 2023). The ratio of urban to rural population is used as a proxy for urbanisation in this study.

2.3.4 Estimation Method

This study employed a panel regression analysis, which involves both panel unit root test and panel cointegration test.

2.3.4.1 Panel Unit Root Test

Kao (1997) has demonstrated that integrated panel data regression though the estimator is consistent, the t-statistic diverges so that inferences about the regression coefficient are wrong with the probability that goes to one asymptotically. Thus, this study carried out panel unit root tests on the dependent and independent variables to avoid spurious regression. The study followed the approach of Im, Pesaran, and Shin (IPS) (1995), who developed a panel unit root test for the joint null hypothesis that every time series in the panel is non-stationary. The main extension by Im et al. (1997) was to allow for heterogeneity in the value of ρ_i under the alternative hypothesis.

2.3.4.2 Panel Cointegration Test

Our panel sample has 14 countries and 22 years, and so has more years than cross-sample units, the variables might not be stationary but I (1) and the model is probably dynamic. In this framework, the use of a panel-ARDL model as proposed by Pesaran and Smith (1995) and Pesaran et al. (1999) is more appropriate. According to these authors, the advantages over other dynamic

panel methods, such as the fixed effects, instrumental variables or the GMM estimators proposed by Anderson and Hsiao (1981, 1982), Arellano (1989), Arellano and Bover (1995) between others is that these methods can produce inconsistent estimates of the average value of the parameters unless the coefficients are identical across countries.

The model estimated has the form of an ARDL (p,q,q,...,q) model

$$\pi_{it} = \sum_{j=1}^p \alpha_{ij} \pi_{ij-1} + \sum_{j=0}^q \delta_{ij} X_{it-j} + \mu_i + \varepsilon_{it} \quad (2.15)$$

Where X is the vector of explanatory variables. Reparametrizing the model, it turns into:

$$\Delta \pi_{it} = \varphi_i (\pi_{ij-1} - \beta_i X_{it}) + \sum_{j=1}^{p-1} \alpha_{ij} \Delta \pi_{ij-1} + \sum_{j=0}^q \delta_{ij} \nabla X_{it-j} + \mu_i + \varepsilon_{it} \quad (2.16)$$

Where the β_i are our vector of interest, which measures the long-run impact of the explanatory variables on the share of renewables and φ_i is the error corrector mechanism impact. The remaining parameters are the short run coefficients. The disturbances ε_{it} are independently distributed across time and units, with zero mean and variance constant within each unit. The model of Eq. 2.3 allows for the parameters to vary between units and as Pesaran and Smith (1995) and Pesaran et al. (1999) showed, this can be consistently estimated using the Mean Group (MG) estimator, which estimates the parameters for each country and then average for the group. However, they also showed that if the long-run coefficients are homogeneous across groups we can use a more efficient estimator, the Pooled Mean Group (PMG) that allows the short run parameters to vary from country to country but forces the long run ones to be homogenous. Finally, to apply these methods the variables have to be a mixture of I (1) and I (0) and for the model to be read as an error correction mechanism, the variables have to be cointegrated.

2.4 Empirical Results Analysis

This section presents descriptive statistics, empirical results and discussion of the results of this study objective.

2.4.1 Descriptive Statistics

The variables' descriptive statistics are covered in this section. Table 2.4 provides the findings.

Table 2. 4: Descriptive Statistics

Variable	Mean	Standard Deviation	Minimum	Maximum
DEP	0.0966	0.09329	0.0021	0.4176
ACS	0.06296	0.05767	0.0029	0.3123
EFF	0.47644	0.11668	0.1395	0.7224
FII	0.2374	0.1291	0.0033	0.4457
DCP	13.8399	8.4891	0.0016	39.3667
DPR	79.783	20.794	1.8875	111.477
GNI	1192.99	1291.86	309.971	6319.57
EDU	44.7311	27.9298	5.5574	143.725
INF	12.1661	38.6871	-9.6162	513.907
MSP	29.3653	18.0307	2.8574	117.192
U2R	0.9674	1.3392	0.0899	9.4417

Source: Author's own calculations, 2024

An analysis of descriptive statistics in Table 2.4 shows that the components of financial inclusion show improvements during the study period. First, depth (DEP) has an average of 0.0966 and a standard deviation of 0.09329. The difference between a minimum value of 0.0021 and maximum values of 0.4176 shows significant improvement in depth across the selected African countries. Second, access (ACS) has a mean value of 0.06296 and a standard deviation of 0.05767. The difference between the minimum value of 0.0029 and the maximum values of 0.3123 shows improvement in access for consumers of financial services. Last, efficiency (EFF) recorded a mean value of 0.47644 and a standard deviation of 0.1167 over the study period. In addition, Appendix

1 contains country-level descriptive statistics of the components of the financial inclusion index for all the selected countries used in this study. The overall average financial inclusion index (FII) is 0.24. It has a standard deviation of 0.13, which means that financial inclusion in SSA is relatively stable across the selected countries during the study period. FII also reported a minimum value of 0.003 and a maximum value of 0.45. However, the region's average of 0.24 is too low, which means that the region is in the class of low financial inclusion status.

The average value of domestic private sector credit (DCP) to GDP ratio is 13.84% with standard deviation of 8.49%. The mean value of dependency ratio (DPR) is 79.78 percent with the deviation of 20.79%. The difference the maximum and minimum values of dependency ratio (DPR) is quite high, which gives the indication that the region had huge dependency burden during the study period. The average value of gross national income per capita is \$1192.99. The region recorded an average value of 44.73% of secondary school enrolment with a standard deviation of 27.93%. The secondary school enrolment in the region is quite low; giving the indication that enrolment at secondary school level in the region is relatively low. The average inflation rate (INF) is 12.17% for the 14 countries with a standard deviation of 38.69%. The mean value of money supply (MSP) is 29.37% with a standard deviation of 18.03% indicating less variability across the sampled countries over the 22-year period. The average urban population to rural population ratio (U2R) is 0.97% across the sampled countries in this study.

2.4.2 An Analysis of Financial Inclusion Indexes in Africa

Table 2.5 below presents results of the PCA for financial inclusion. The PCA requires that the eigenvalues are computed for every component (Jolliffe, 2002). According to Jolliffe (2002) criterion, the eigenvalues, as presented on Table 2.5, are calculated for every component to maintain the common factors when the eigenvalue is greater than one.

Table 2. 5: Principal Component Analysis (PCA) for financial inclusion

Principal components/correlation				Number of obs:	594	
				Number of comp.	3	
				Trace	3	
Rotation: (unrotated = principal)				Rho	1.0000	
Variable	DEP	ACS	EFF	Proportion	Cumulative	Eigenvalue
PC1	0.7018	0.6936	0.1624	0.5652	0.5652	1.69555

Source: Author's own computations, 2024.

According to Sarma (2008), financial inclusion can be classified into low, medium, and high categories as captured in Table 2.6 below:

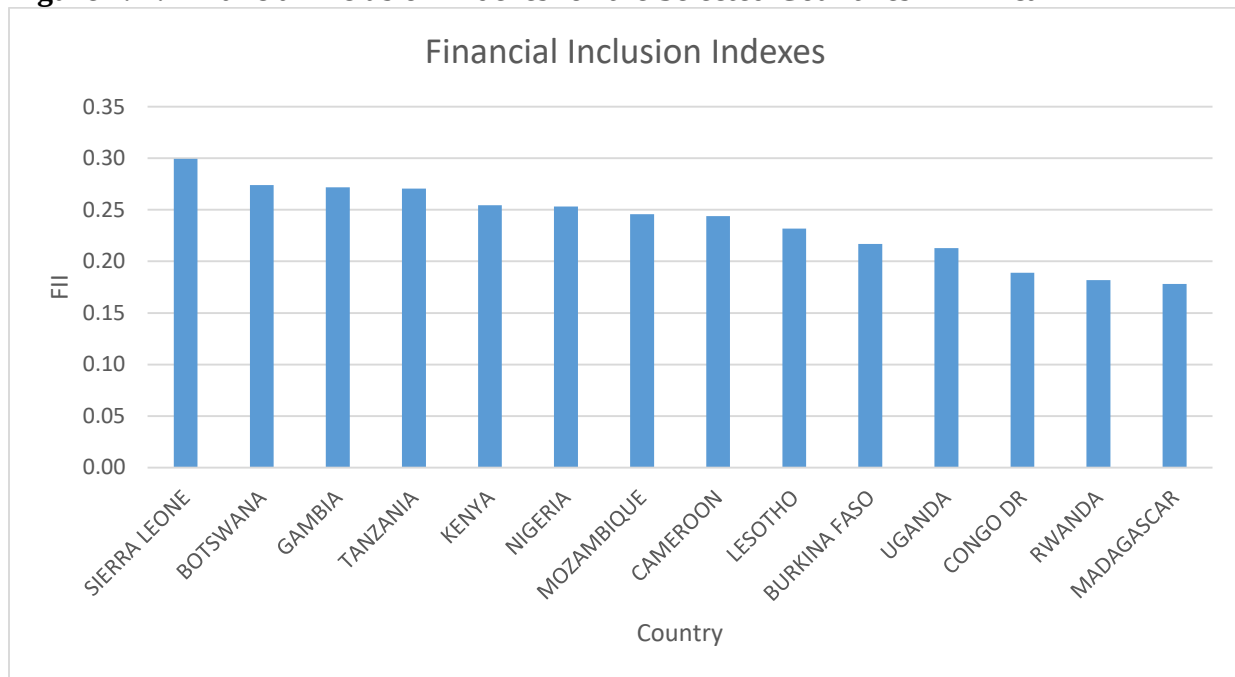
Table 2. 6: Financial Inclusion Index Classification

Financial Inclusion Score	Overall Financial Inclusion Classification
0 - 0.3	Low Financial Inclusion
0.3 - 0.5	Medium Financial Inclusion
0.5 - 1.0	High Financial Inclusion

Source: Sarma (2008; 2012)

Figure 2.2 presents the average financial inclusion indexes for the countries used in this study. Based on Sarma (2008)'s classification of financial inclusion indexes, only Sierra Leone recorded an average financial inclusion index of 0.30, which places it in the medium financial inclusion rated category. The other countries (that is Botswana, Gambia, Tanzania, Kenya, Nigeria, Mozambique, Cameroon, Lesotho, Burkina Faso, Uganda, Congo Dr. Rwanda, and Madagascar), recorded average financial inclusion indexes that were below 0.30, which placed them in the low financial inclusion category. This means that 92.85 percent of the African countries used in this study fell in low financial inclusion category. Per the findings of this study, the trend in financial inclusion is consistent with recent studies. Nsiah et al (2023) found that majority of the African countries in their study also fell in low financial inclusion category.

Figure 2. 2: Financial Inclusion Indexes for the Selected Countries in Africa



Source: Author's own construct, 2023

2.4.3 Determinants of Financial Inclusion in Africa

This section presents and discusses the descriptive statistics, pairwise correlation matrix, and regression results of the factors that drive financial inclusion in Africa.

2.4.3.1 Correlation Matrix

Table 2.7 shows the correlation matrix of the variables employed in the study to estimate Equation (2.4). The essence of conducting correlation test is to find out whether the dataset contains problem of multicollinearity. A decision rule provided by Donald and Gluaber (2005) indicates that the correlation between the independent variables should be lower than 0.8. It can be observed from Table 2.7 that the variables used in this study did not display the problem of multicollinearity, which implies there is no multicollinearity in the dataset.

Table 2. 4: Pair-wise Correlation Matrix

Variable	FII	DCP	DPR	GNI	EDU	INF	MSP	U2R
FII	1.000							
DCP	0.122	1.000						
DPR	-0.142	-0.770	1.000					
GNI	0.000	0.506	-0.715	1.000				
EDU	0.331	0.237	-0.233	-0.101	1.000			
INF	-0.143	-0.057	0.047	0.025	-0.091	1.000		
MSP	0.337	0.496	-0.247	-0.163	0.398	-0.145	1.000	
U2R	0.160	0.032	-0.164	-0.118	0.283	-0.086	0.128	1.000

Source: Author's own computation, 2024

2.4.3.2 Discussion of the Determinants of Financial Inclusion in Africa

This section presents and discusses the results on the determinants of financial inclusion. Table 2.8 presents the regression results on the factors that drive financial inclusion in Africa.

Table 2. 5: Panel Cointegration Estimates of the Determinants of Financial Inclusion

Variable				
LR		Coefficient	Standard error	t-statistic
	lnDCPS	0.002226	0.005181	0.43
	lnDPR	1.738399***	0.624502	2.78
	lnGNI	2.028561***	0.225774	8.98
	lnEdu	0.621935***	0.095191	6.53
	INF	0.007771***	0.000522	14.89
	lnMS	0.692818***	0.109544	6.32
	lnU2rRatio	-0.130226***	0.298071	-0.436896
SR		-		
	ECT	-0.580709***	0.112737	-5.15
	Δ lnDCPS	0.017693	0.045272	0.39
	Δ lnDPR	9.598185	17.61162	0.54
	Δ lnGNI	-0.357161	0.698708	-0.51
	Δ lnEdu	0.020674	0.202914	0.10
	Δ INF	-0.001200	0.003158	-0.38
	Δ lnMS	0.064010	0.366631	0.17
	Δ lnU2rRatio	107.0694	94.46118	1.13
	Constant	-17.91179***	3.806377	-4.71

Source: Author's own computation

Note: The asterisks *, ** and *** denote statistical significance at the 10%, 5% and 1% levels, respectively.

The error correction term (ECM (-1)) displays the endogenous responses to shocks of the dependent variables by depicting the rate of adjustment. The ECM coefficient in Table 2.8 is negative, demonstrating the co-integration and stability among the model's variables. As a result, the model has a 1% level of significance for stability, and equilibrium in the long run will change following any short-term shock by about 58 percent annually. The ECM coefficient demonstrates that after short-term shocks, the long-run equilibrium is reached for financial inclusion, private sector credit to GDP ratio, dependency ratio, GNI per capita, education, inflation, money supply, and urban to rural population ratio.

The dependency ratio exerts significant positive effect on financial inclusion in the long run in Sub-Saharan Africa at the 1% level of significance. A percentage increase in the dependency ratio increases the financial inclusion index by 1.74 percent in the long run in SSA. The result is surprising as one expects that dependency burden will constrain households to patronise fully in the financial sector. However, several reasons can be cited for this observed result. In some cases, a high dependency ratio might lead to increased demand for financial services, such as savings products, insurance, and pension plans, to support dependents. Also, higher dependent ratio may lead to increased demand for financial planning tools, such as savings accounts, insurance, and pension plans, to ensure the well-being of dependents. All these may explain the observed positive relationship between dependency ratio and financial inclusion. Again, this study results deviate from the findings of Nsiah and Tweneboah (2023) who found insignificant effect of dependency ratio on financial inclusion in Africa. However, dependency ratio has insignificant effect on financial inclusion in the short run even at the 10 percent level of significance in sub-Sahara Africa.

The results indicate that GNI per capita exerts significant effect on financial inclusion in the long run at the 1% level of significance of the selected Sub-Saharan African countries. The magnitude of the coefficient implies that if GNI per capita increases by 1 percent financial inclusion increases by 2.03 percent. Higher disposable income individuals are more likely to have access to financial services such as savings, credit and insurance. Again, higher income individuals may have more opportunities to develop financial literacy, enabling them to make informed decisions about financial products and services. In addition, higher income individuals are more likely to have the ability to save and invest, which can lead to greater financial stability and security. The result is consistent with the findings of Park and Mercado (2015) who also explained that involuntary financial exclusion in Asia may be driven largely by insufficient household income. Our finding is consistent with recent empirical studies that found a positive, significant relationship between the level of financial inclusion and GNI per capita (Fungacova & Weill, 2014; Nsiah & Tweneboah, 2023; Park & Mercado, 2018).

The results also show that education exhibits significant positive effect on financial inclusion even at the 1 percent level of significance in the long run in SSA. The positive sign of the coefficient indicates that the higher the proportion of number of people who have completed primary education, the higher the level of financial inclusion. It is well understood that education provides the individuals with relatively adequate information such as existence of financial institutions, the need to save or take an insurance policy, and relevance of financial institutions for economic agents (individuals/households and businesses). This means that the higher literacy rate (education), the more likely they participate in the financial sector. The result is consistent with the findings of Datta and Singh (2019) who found positive significant effect of education on financial inclusion. However, level of education has insignificant effect on financial inclusion in the short run.

Inflation is positively related with financial inclusion in the long run in Sub-Sahara Africa at the 1% significant level. The magnitude of the coefficient implies that if inflation increases by a percentage point, financial inclusion increases by 0.8 percent. This is surprising as it is expected that increase in inflation will reduce real income of household leading to a reduction in the demand for financial services. Perhaps increase in inflation encourages them to purchase financial products such as fixed deposit and treasury bills since in such times of high inflation, interest rates on these financial products also increase making them attractive to economic agents. Also in inflationary periods, economic agents may resort to purchasing financial services and products as a store of value because they may be afraid of the depreciating the value of their currencies (Tsouli, 2022). Hence, increase in inflation increases the level of financial inclusiveness. The results of this study consistent with Driss Tsouli (2022) who also found a positive relationship between financial inclusion and inflation. However, inflation has insignificant effect on financial inclusion in the short run even at the 10% level of significance.

The study shows that money supply has significant effect on financial inclusion at the 1 percent level of significance in the long run in Sub-Saharan Africa. This implies that a percentage increase in money supply increases financial inclusion index by 0.69 percent in the long run in SSA. An increase in money supply can lead to increased lending by financial institutions, making credit more accessible to individuals and businesses. Again, an expansionary monetary policy can lead to lower interest rates, making borrowing more affordable and increasing access to credit for marginalized group (Demirguc-Kunt & Klappper, 2012). However, money has insignificant effect on financial inclusion in the short run even at the 10% level of significance in SSA.

The ratio of urban population to rural population has significant negative effect on financial inclusion of the selected Sub-Saharan African countries at the 1 percent level of significance in the long run. The result is surprising as one expects that a rise in the percentage of urban population, the financial sector's operation is likely to expand in order to cater to the increased demand for financial services and bring more urban population into the formal financial sector. Perhaps, urbanization in the selected Sub-Saharan African countries lead to a growing informal economy, where workers may not have access to formal financial services. Again, high cost of living in urban areas can make it difficult for low-income individuals to save or invest in financial services. The result deviates from the findings of Datta and Singh (2019) who found insignificant effect of urbanisation on financial inclusion. However, urbanisation has insignificant effect on financial inclusion in the short run even at the 10% level of significance in SSA. The results indicate that domestic credit to private sector exerts insignificant effect on financial inclusion both in the short run and long run in Sub-Saharan Africa even at the 10 percent level of significance. This means that domestic credit extended to the private sector is not a key predictor of financial inclusion.

2.5 Summary, Conclusions, and Recommendations

2.5.1 Introduction

This chapter summarizes and concludes the findings of the study and offers appropriate policy recommendations for implementation to improve the level of financial inclusion in Africa.

2.5.2 Summary of the Findings

The study developed a financial inclusion index for 14 sampled sub-Saharan African countries (that is Botswana, Burkina Faso, Cameroon, Congo DR., Gambia, Kenya, Lesotho, Madagascar, Mozambique, Nigeria, Rwanda, Sierra Leone, Tanzania, and Uganda) using bank and insurance

data inclusion data. Following recent empirical literature, the study measured financial inclusion as an index rather than as a single indicator because financial inclusion is multidimensional in nature, hence, best represented as an index rather than as a single indicator. In order to construct to the index, the study adopted PCA approach like recent studied (Cámara & Tuesta, 2014; Nsiah et al., 2021; Tsouli, 2022) and used depth, access, efficiency as dimensions for the index.

The literature suggest that financial inclusion scores lie within a range of 0 and 1; with 0 representing no financial inclusion and 1 representing absolute financial inclusion (Park & Mercado, 2015; Sarma, 2008; Sarma & Pais, 2011; Triki & Faye, 2013; Tsouli, 2022). The landmark study by Sarma (2008) provides a classification for financial inclusion scores: that is low financial inclusion (0 - 0.3), medium financial inclusion (0.3 - 0.5), and high financial inclusion (0.5 - 1.0).

The study finds that only Sierra Leone that recorded an average financial inclusion index of 0.30 whilst the other sampled countries recorded average financial inclusion scores lower than 0.30. Using the Sarma (2008) classification scale, the study finds that only Sierra Leone can be classified as medium financial inclusion and the other sampled countries falling within the low financial 92.85 percent of the sampled countries fell in low financial inclusion category during the study period. The trend in the finding is consistent with recent studies. Nsiah et al (2023) found that majority of the African countries in their study also fell in low financial inclusion category. The positive sign, however, is that the study finds that an upward trend (yearly) in the level of financial inclusion in Africa during the study period, which gives the comfort that most of the African countries would move into medium to high financial inclusion category in the very near future.

The study investigated the factors that drive financial inclusion in Africa. First, the study found that dependency ratio positively significantly influences financial inclusion in Sub-Saharan Africa in the long run. Second, the study found that GNI per capita is positively significantly related to financial inclusion in the long run, which means increase in GNI per capita causes the individuals to patronize financial products in the long-run. Third, the study established that the level of education exerts significant positive effect on financial inclusion. The positive sign of the coefficient indicates that the higher the proportion of number of people who have completed primary education, the higher the level of financial inclusion. Fourth, inflation is positively related with financial financial inclusion during the study period in the long-run but insignificant in the short-term. Fifth, money supply was found to be positively significantly related to financial inclusion in the long-run. An increase in money supply can lead to increased lending by financial institutions, making credit more accessible to individuals and businesses. Finally, the study found evidence to suggest that urbanisation is negatively related financial inclusion in the long-run.

2.5.3 Conclusion

First, the study constructed a financial inclusion index for selected sub-Saharan African countries. Unlike previous studies who used just bank data to construct their indices for financial inclusion, this study used data from both banking and insurance industries, thereby, providing a fresh new perspective on financial inclusion in Africa. The study was from 2000 to 2021 and used the PCA approach to construct the index. The study found apart from Sierra Leone that recorded an average financial inclusion index of 0.30, the 13 other sampled countries in the study recorded average indexes below 0.30. This implies that, per Sarma (2008)'s classification, that only Sierra Leone can be classified as medium financial inclusion economy whilst the 13 other countries are classified low financial inclusion economies; that is 92.85 percent are rated low in financial

inclusion. The overall average financial inclusion index for all sampled countries was 0.24, which means the 13 other sampled countries can be categorised as low financial inclusion continent. The positive sign, however, is that the study found an increasing yearly financial inclusion trend for all the countries during the study period.

Second, the literature suggest that financial inclusion is crucial to inclusive growth because it helps to promote economic growth and reduce the prevalence of poverty and income inequality in an economy. It was, therefore, important to ascertain what influences financial inclusion from demand-side and supply-side in Africa. To this end, the study investigated the factors that drive financial inclusion in Africa in the long and short-run and found that gross national income per capita, dependency ratio, education, inflation, and money supply inflation exert a positive relationship whilst urbanisation exhibit a negative relationship with financial inclusion during the study period. Further, the study finds that domestic credit to private sector exhibits an insignificant effect on financial inclusion in Africa; even at the 10 percent level of significance, during the study period.

2.5.4 Recommendations

Based on the findings of this study, the following recommendations were made for both policymaking and for future research.

First, findings from this study show that governments of African countries should implement policies and programmes that ensure steady macroeconomic and stable political environments in order to create a conducive to business environment that supports private sector growth. Private sector growth tend encourage job creation (boost income levels), stimulates economic growth, reduce inflation, reduce income inequality amongst individuals and households. In addition, they

must ensure growth is inclusive to boost urban growth, which study to positively impact financial inclusion in Africa.

Second, governments and regulators of the financial services industries must design and implement rules and regulations that create confidence in the financial sector to promote financial inclusion; especially as the empirical literature suggest that high levels of financial inclusion tend improve economic growth and reduce income inequality in an economy. The study found a positive trend of financial inclusion across the sampled countries, which means that current policies and regulations are working positively to improve financial inclusion. Also, regulators must look to limiting and/or eliminating barriers to financial inclusion such as the excessively high cost of financial services (like high cost of borrowing and taking an insurance policy) and cumbersome documentation required (like customer due diligence and know-your-customer requirements) to access the formal financial sector. Further, financial services providers (such as the banks and insurance companies) and regulators must embark on financial literacy and integrated advice programmes to educate citizens and demystify the notion that the formal financial sector is only for the rich and educated. They must infuse trust and confidence in the formal financial sector. The literature suggest actual usage is critical to increasing the level of financial inclusion so financial services providers must have products for all segments of the population to encourage patronage and usage. Overall, financial services providers and regulators must help to expand depth, increase access, and improve efficiency in the financial system to improve the level of financial inclusion in the countries.

Future studies may consider constructing a financial inclusion index that incorporates the other financial sector players such as the capital market, which would enhance the empirical literature

on financial inclusion. Future researchers can expand the scope of their studies to cover other African countries not sampled in this study and other economies in the world so that the results can easily be generalized globally. Future researchers may also consider estimating the threshold effect of financial inclusion on economic growth, poverty and income inequality. Such a study is critically important because it would provide an empirical evidence regarding what level of financial inclusion actually improves economic growth and reduces poverty and income inequality in an economy.

CHAPTER 3

THRESHOLD EFFECT OF FINANCIAL INCLUSION ON ECONOMIC GROWTH AND INCOME INEQUALITY IN AFRICA

3.0 Introduction

The development of an economy is marked by a set of positive evolutions in structural changes such as economic growth (productive growth), reduction in the prevalence of poverty, and eradication of income inequality amongst economic agents; particularly individuals and households (Koomson et al., 2020b; Silue, 2021). The African continent can boast of many natural resources but due to lack of inclusive growth; caused by the lack of equitable distribution (access and use) of these resources, citizens on the African continent remain the poorest people globally (Bank, 2020; Beegle & Christiaensen, 2019; Candia et al., 2020; Jemli & Chtourou, 2022; Nwani & Osuji, 2020; Triki & Faye, 2013). The African continent is also saddled by low or negative economic growth as well as widespread income inequality; particularly against women, rural dwellers, and other vulnerable groups (Demirgüç-Kunt et al., 2013; Triki & Faye, 2013).

The global covid-19 pandemic has worsen the situation on the African continent further (Nsiah & Tweneboah, 2023; Patel & Kariel, 2021). The covid-19 pandemic is expected to push more individuals and households (particularly in developing countries) into extreme poverty; with an estimated 150–199 million additional people falling into extreme poverty (Diop & Asongu, 2023; Hao, Gregg, & Yao, 2023; Patel & Kariel, 2021; Suryahadi, Al Izzati, & Suryadarma, 2020). It is expected that the covid-19 pandemic will reduce economic growth and widen income inequalities amongst individuals and households (Diop & Asongu, 2023; Hao et al., 2023; Patel & Kariel, 2021; Suryahadi et al., 2020).

In recent the decades, successive governments and international development agencies (such as the World Bank and the International Money Fund) have put in place policies and programmes aimed at encouraging economic growth, reducing the prevalence of poverty and income inequalities amongst individuals and households in Africa (Nsiah et al., 2021; Sethi & Acharya, 2018; Silue, 2021; Triki & Faye, 2013). In addition, donor agencies and wealthy nations have donated funds, provided economic expertise, and forgiven debts owed by developing countries to promote growth and development in Africa. Notwithstanding the fact that some strides have been made in respect of economic growth and the fight against poverty and income inequality, not much progress has been made on the continent (Nsiah & Tweneboah, 2023).

In recent times, therefore, there has been a deliberate shift toward a more inclusive and sustainable growth agenda to ensure there is shared prosperity (Triki & Faye, 2013). Growth that is both socially and politically sustainable has been identified as critical to ensuring there is sustainable economic growth and income inequality reduction (Ofosu-Mensah Ababio et al., 2021; Triki & Faye, 2013). The drive toward achieving inclusive growth and development has contributed to the Sustainable Development Goals (SDGs) (Makarenko, Nivorozhkina, Tregubova, Toropova, & Nazarova, 2022). The SDGs are set of seventeen (17) global goals by the United Nations Development Programme (UNPD). Amongst other things, the SDGs are aimed at ending poverty, promoting economic growth, and fighting inequality by 2030 (Ofosu-Mensah Ababio et al., 2021). SDG goals such as Goal 3 (good health and well-being), Goal 8 (decent work and economic growth) and Goal 10 (reducing inequalities), therefore, motivate this study.

The literature suggests that access to finance is important to achieving inclusive growth and development (Park & Mercado Jr, 2018; Triki & Faye, 2013). Thus, financial inclusion (inclusive

finance) promotes inclusive growth and development (Koomson et al., 2020b; Triki & Faye, 2013). On the other hand, financial exclusion, which refers to where qualified economic agents, are not able to access formal financial system (including its basic services and products) retards growth and development (Barr, 2004; Carbó, Gardener, & Molyneux, 2005; Leyshon & Thrift, 1995; Marshall, 2004; Sinclair, 2001). The literature, therefore, suggest that financial exclusion presents a global challenge because it negatively impacts economic agents, plunges more individuals and households into poverty, fuels income inequality, and hinders economic growth (Demirguc-Kunt & Klapper, 2012; Omar & Inaba, 2020a; Park & Mercado Jr, 2018).

The empirical literature, thus, suggests a relationship between financial inclusion and economic growth, poverty alleviation and income inequality (Koomson et al., 2020b; Levine, 1997; Nembua, 2014; Sarma & Pais, 2011; Triki & Faye, 2013; Van et al., 2021) but there no global consensus on the direction of the relationships between financial inclusion and these other variables (Hannig & Jansen, 2010; Seven & Yetkiner, 2016).

3.1 The Concepts of Sustainable Development, Economic Growth, and Inequality

Historically, the concept of development is difficult to define but some studies have argued that it can be descriptive (to explain economic, socio-cultural and environmental transformation) or normative (as a prescription for how economies, societies and environments should be transformed) (Apter & Sawa, 2007). Recent literature, however, suggest that development is where individuals and households enjoy better or enhanced lives (Mensah, 2019; Peet & Hartwick, 2015). A better life refers to where all economic agents have access to the basic needs (such as access to food and potable drinking water, access to good health-care, availability of shelter and housing, and security), enjoy basic dignity and the respect required for human beings (Ofosu-Mensah Ababio et al., 2021; Peet & Hartwick, 2015). Other studies have suggested that things like

advancements in modern science and technology, a well-functioning democracy, improvements in social organisations, good ethics and value system are core to enhancing global development (Peet & Hartwick, 2015).

The literature suggest that development has to be inclusive to be sustainable (Triki & Faye, 2013). This is because development improves the life conditions of households and individuals within, it ensures sustainable economic growth, and it aids efforts of poverty alleviation and reduction income inequality of households and individuals over time (Potter, Conway, Evans, & Lloyd-Evans, 2012; Potter, Binns, Elliott, & Smith, 2008; Salami, Tilakasiri, & Ahmed, 2017).

The concept of sustainable development has taken centre stage in the global development conversation in recent decades (Hajian & Kashani, 2021). In fact, sustainable development has been widely recognised a critical goal in human society in the 21st century (Hajian & Kashani, 2021). The concept of sustainable development, which was made popular by the Brundtland Commission Report in 1987, suggests that human beings must live responsible lives so as not to negatively impact the livelihood of future generations (Borowy, 2013, 2021; Hajian & Kashani, 2021; Redclift, 2005).

3.1.1 The Sustainable Development Goals of 2015

The need for inclusive growth and development has led to the SDGs (Makarenko et al., 2022; Ofosu-Mensah Ababio et al., 2021). The SDGs are a set of 17 goals that were adopted by the members States of the United Nations in 2015 (Ofosu-Mensah Ababio et al., 2021). At the core, the SDGs provide a shared blueprint for peace and prosperity for people and planet for now and into the future (UNDP 2015). In broad terms, the SDGs are expected to ensure an end to poverty, encourage economic growth, reduce income inequality, protect the planet (tackling

climate change), promote health and education, ensure that all people enjoy peace and prosperity, by 2030 (Makarenko et al., 2022; Ofosu-Mensah Ababio et al., 2021). Table 3.1 below list the SDGs:

Table 3. 1: Sustainable Development Goals (SDGs)

#	Goal	#	Goal
1	No Poverty	10	Reduced Inequalities
2	Zero Hunger	11	Sustainable Cities & Communities
3	Good Health & Well-Being	12	Responsible Consumption & Production
4	Quality Education	13	Climate Action
5	Gender Equality	14	Life Below Water
6	Clean Water & Sanitation	15	Life on Land
7	Affordable & Clean Energy	16	Peace, Justice & Strong Institutions
8	Decent Work & Economic Growth	17	Partnerships for the Goals
9	Industry, Innovation & Infrastructure		

Source: UNDP, (2024)

Two (2) of the SGDs are relevant to this study, hence, they provide motivation for this study. These are Goal # 8 (Decent Work and Economic Growth), and Goal # 10 (Reduced Inequalities) and they are discussed below:

3.1.1.1 Goal 8: Decent Work & Economic Growth

This goal is aimed at promoting sustained, inclusive and sustainable economic growth as well as ensuring there is full and productive employment and decent work (Halkos & Gkampoura, 2021; Lapinskaitė & Vidžiūnaitė, 2020; Ofosu-Mensah Ababio et al., 2021). This goal is in two folds, which are decent work and economic growth.

First, decent work target includes; but not limited to the following, the reducing unemployment amongst the youth (15 years –24 years) population, improving literacy (education or training)

levels, eradicating forced labour, ending modern slavery and child labour globally, ensuring that labour rights are protected and people work in safe and secure working environments, and adopting a global strategy for youth employment (Lapinskaitė & Vidžiūnaitė, 2020). Second, the economic growth targets include; but not limited to, ensuring that the growth in gross domestic product of least developed countries increases by at least 7 percent, encouraging growth of enterprises globally. Further, this goal requires that economic growth is achieved in an environmentally friendly manner. It also requires governments and regulators to implement measures that strengthen and make financial institutions efficient (that is ensure a well-functioning intermediation process) so as to improve the level of financial inclusion across the world (Lapinskaitė & Vidžiūnaitė, 2020). Goal #8 is important because the literature suggest that economic growth can improve the life and well-being of economic agents (Alamanda, 2021; Ghosh, 2020a; Nsiah & Tweneboah, 2023; Omar & Inaba, 2020a).

3.1.1.2 Goal 10: Reducing Inequalities

The goal aims at reducing inequality within and among countries; such that no one is left behind (Ofosu-Mensah Ababio et al., 2021). Inequality is still a global concern (Agyemang-Badu et al., 2018; Alamanda, 2021; Ofosu-Mensah Ababio et al., 2021). Inequality is commonly based on, but not limited to, the following: income, ethnicity, race, sex, disability, religion, age, sexual orientation, and class (UN, 2021). Inequality is concern because it has the potential to negatively impact both social (encourage crime) and economic development in the long-run, it could work against attempts to eradicate the prevalence of global and country-level poverty, and can create a negative psychological impact (self-worth and a sense of fulfilment) for those discriminated individuals and countries against (UN, 2021). Effectively, Goal # 8 connotes a world where

everyone (irrespective of the person's ethnicity, race, sex, disability, religion, age, sexual orientation, and class) is included.

It is estimated that over seventy (70) percent of the global population continue to experience inequality (UN, 2021). Comparatively, inequality is more prevalent in the less developed or developing economies than in wealthy economies (UN, 2021). The statistics also point to the fact that income and wealth distribution are still heavily skewed at the top, which keeps the income gap between the rich and the poor & vulnerable people as well as the wealthy and the poor countries widening at an alarming rate (UN, 2021). Recent statistics that show that though income generally grew across the globe, the rich and wealthy (who represent the top 10 percent of global population) received at least 20 percent of the income whilst the poor and vulnerable (who represent the bottom 40 percent of the population) received less than 25 percent of the overall income (UNDP, 2020).

3.1.2 The Concept and Measurement of Economic Growth

The term growth generally implies quantitative increase, hence, economic growth has been referenced as a quantitative concept (Shearer, 1961). In basic terms, economic growth refers to steady growth in the productive capacity of an economy over time (Michalos, 2014). It involves observing and accounting for trends in levels and rates of growth of per capita income over a period of time (Lucas Jr, 1988; Michalos, 2014). Economic growth is expected to improve the economic life of economic agents (Agyekum, 2017; Nsiah & Tweneboah, 2023).

Over the years, economists have used different measures to calculate economic growth (Agyekum, 2017; Boughton, 1995; De Haan, Pleninger, & Sturm, 2022; Lateef & Boughton, 1995; Levine, 1997; Nsiah & Tweneboah, 2023; Ratnawati, 2020). Some of these are explained below:

Gross Domestic Product (GDP)

GDP is one of main indicators used by economists to assess the economic growth of an economy and it operates within the national account framework of a country. The concept of GDP gained prominence between 1654 and 1676 in the United Kingdom thanks to Sir William Petty, who published his calculations of England's taxable capacity (Edwards, 2010; Leipert, 1987; Lepenies, 2016). Post the World War II, the relevance of GDP as the main criteria for measuring economic development was further deepened by the Bretton Woods Conference in 1944.

GDP is measured as the amount or monetary value of final output (goods and services) produced and finally consumed within an economy in a given period; usually quarterly or a yearly (Michalos, 2014). In calculating economic growth using GDP as the proxy, the entire economic output/goods and services produced in a country is taken into consideration; irrespective of whether they are consumed in-country or exported overseas in a given period. Changes in a country's GDP (often computed quarterly or yearly) is a commonly used indicator by economists and statisticians to determine the overall economic performance, health or development of most economies. According to the Bureau of Economic Analysis (under the U. S. Department of Commerce) goods are tangible things people make, grow or extract from the land such as furniture, real estates, oranges, and jewelry whilst services are actions that people do for someone else such as banking services, consultancy, and teaching.

Gross National Product (GNP)

GNP measures the amount of final goods and services produced by citizens of a country irrespective of their geographical location (both home and abroad) as of the time of production using inputs belonging to residents of the country within a given period (Barro, 2003; Bloom et al., 2021; Ponomarenko, Nevskaya, & Marinina, 2020; Spyros, 2020).

3.1.3 The Concept and Measurement of Income Inequality

Inequality (inequality of opportunity) has been identified as a major development concern globally; particularly in developing economies (Cowell, 2000; Ofosu-Mensah Ababio et al., 2021; Ogbeide & Agu, 2015; Waldman, 1977). This is because inequality adversely impacts socio-economic development and increases the prevalence of poverty amongst individuals and households (Ofosu-Mensah Ababio et al., 2021). Inequality can be based on income, ethnicity, race, sex, disability, religion, age, sexual orientation, and class (UN, 2021).

There is no single definition of inequality but the literature suggests that inequality refers to the absence of equality or the disproportionate allocation of resources amongst economic agents (Cowell, 2000; Odera & Mulusa, 2020; Ogbeide & Agu, 2015; Waldman, 1977). Inequality measures are mainly based on non-linear statistics (Marchetti & Tzavidis, 2021). In the literature, inequality has been measured in a number of ways such as income, consumption, wealth, gender, employment, health, economic power, and opportunities (Odera & Mulusa, 2020; Ogbeide & Agu, 2015; Ray, 1998; Waldman, 1977). This study focuses on income inequality.

Income inequality refers to the inequitable distribution of income within a group, society, or an economy (Chancel, Cogneau, Gethin, Myczkowski, & Robilliard, 2023; Odera & Mulusa, 2020; Ogbeide & Agu, 2015). It is where the share of income amongst individuals is disproportionate and not inclusive (Asongu, Nnanna, & Acha-Anyi, 2020; Bourguignon, 2004; Chancel et al., 2023; Demirgüç-Kunt et al., 2013). The literature suggest that income inequality is prevalent amongst women, the poor, and the vulnerable groups compared to men and the wealthy individuals and households (Chancel et al., 2023; Cuberes & Teignier, 2014; Demirgüç-Kunt et al., 2013; Newman, 2017). Income inequality can be measured in several ways but Theil Index, the Gini

Index, and Inequality-Adjusted Human Development Index are widely used measures of income inequality (Ceriani & Verme, 2012; Förster, Jesuit, & Smeeding, 2002; Marchetti & Tzavidis, 2021; Ofosu-Mensah Ababio et al., 2021; Sitthiyot & Holasut, 2020).

- **Theil Index**

The Theil index is an additively decomposable index of income inequality, allowing one to estimate each sub-group's contribution to total income inequality within a population (Cowell, 2000; Förster et al., 2002). The index is mainly used to examine the relative difference in contribution of resource allocation between different regions, as well as decomposing the overall difference (Yu, Yu, He, & Lu, 2021). The Theil index belongs to the family of generalized entropy measures (Marchetti & Tzavidis, 2021). It is popular because of its ability to decompose into “between” and “within” domains (Marchetti & Tzavidis, 2021).

- **Gini Coefficient**

Gini coefficient (also called Gini Index or Gini Ratio) is another widely used indicator for income or wealth inequality (Ceriani & Verme, 2012; Chameni Nembua, 2008; Fisher, 2004; Marchetti & Tzavidis, 2021; Nembua, 2014; Shorrocks, 1982; Yitzhaki, 1983). The Gini index is attributed to an Italian statistician called Corrado Gini, who developed the coefficient in 1912 (Ceriani & Verme, 2012; Chameni Nembua, 2008; Fisher, 2004; Nembua, 2014; Shorrocks, 1982; Yitzhaki, 1983). The Gini index is expressed using the Lorenz curve (LC) with various calculations (Marchetti & Tzavidis, 2021; Yitzhaki, 1983; Yu et al., 2021). The LC helps to plot the cumulative percentages of the population against their cumulative aggregate incomes or wealth (De Maio, 2007; Förster et al., 2002).

Using the Gini index, researchers are able to statistically distribute income or wealth of households and individuals to lie between the range of zero (0) and one (1); with zero representing perfect equality and one representing maximum or perfect inequality (Förster et al., 2002; Swart, 2020; Yitzhaki, 1983; Yu et al., 2021). Thus, Gini index close to 1 denotes the higher the level of income inequality amongst individuals and households whilst a Gini index close to 0, represents a much fairer distribution of income or resources amongst individuals and households in an economy (Förster et al., 2002; Swart, 2020; Yitzhaki, 1983; Yu et al., 2021). The Gini coefficient is more popular because it is simple to estimate and widely used by researchers (Marchetti & Tzavidis, 2021; Swart, 2020).

Inequality-Adjusted Human Development Index

The IHDI is another proxy for income inequality and inclusive development in recent studies (Chowdhury, Parida, & Goel, 2021; Ofosu-Mensah Ababio et al., 2021; Permanyer & Smits, 2020). IHDI measures improvements in general wellbeing and freedom of individual and households in a society (Ofosu-Mensah Ababio et al., 2021; Permanyer & Smits, 2020).

A review of existing literature in income inequality shows the Gini coefficient dominate as a measure or proxy for income inequality globally (Chameni Nembua, 2008; Lambert & Aronson, 1993; Nembua, 2014; Shorrocks, 1982). For this reason, this study uses the GINI coefficient as proxy for income inequality. The GINI coefficient is discussed further in later in this study.

3.2 Literature Review: Theoretical Foundation

To provide sound foundation to this study, this study reviews the popular theories that are relevant to this study. These are discussed below:

3.2.1 Schumpeter's Theory on Economic Growth

The 1911 seminal exposition by Joseph A. Schumpeterian highlights the link between economic growth and the financial sector (Aghion, Howitt, Howitt, Brant-Collett, & García-Peñalosa, 1998; Schumpeter, 1934; Ustarz & Fanta, 2021). The financial sector through its financial intermediation function plays a key role in the economic development of any economy (Aghion et al., 1998; Schumpeter, 1934; Ustarz & Fanta, 2021). The financial sector improves the liquidity and tradability of financial assets in an economy (through saving mobilization and redistribution of the savings to economic agents) for productive purposes, reduces information asymmetry and reduces transaction costs, manages and diversifies risks, and facilitates transactions (Agbloyor et al., 2014).

The Schumpeter framework highlights that fact that a well-functioning financial sector is essential to achieving economic growth (Adjasi & Biekpe, 2006; Agbloyor et al., 2014; Beck et al., 2000; King & Levine, 1993a, 1993b). The framework posits that the financial sector impacts economic development through redistribution of savings within the economy rather than just through varying the rate of savings within the same economy (Aghion et al., 1998; Emami Langroodi, 2021; Levine et al., 2000).

3.2.2 The Solow-Swan Theory of Economic Growth

The first neo-classical growth theories emerged between 1950s – 1960s. This was just around the time of the groundbreaking works by Robert Solow (1956) and Trevor Swan (1956). Robert Solow and Trevor Swan did independent studies on the economic growth but the similarity in their works and fact that they did them in the same time pulled their theories together into the famous Solow-Swan theory of economic growth. The contributions from their works is so important that any in-depth analysis of the neo-classical theories of economic growth would not be complete without a

discussion of the Robert Solow and Trevor Swan theories of economic growth (Engelbrecht, 1999; Łukasz, 2014; Sharipov, 2015; Solow, 1956; Swan, 1956).

Robert Solow was an American (United States of America) economist who supported a closed economic situation and objected to a direct state and federal government interference (for example government expenditure) in the economy with the view to achieving economic growth. He supported the idea large businesses are allowed to freely operate in the competitive market and optimise all the resources at their disposal to in order to achieve economic growth (Sharipov, 2015; Solow, 1956). He believed that for the economic system to reach equilibrium, aggregate demand must equal aggregate supply. The central theme of his thinking on economic growth is the classical aggregate production function/factors of production (that is labour and capital) and the theory of marginal productivity or marginal product (that is diminishing return to capital) (Agbloyor et al., 2014; Engelbrecht, 1999). The wisdom behind this is the fact that once the factors of production are independent of the state or federal government interferences, any income earned by those who own the factors of production would be as a result of the marginal products or productivity of these factors (Mankiw, Romer, & Weil, 1992; Solow, 1956).

Solow's theory suggests that economic growth emanates from three (3) sources; investments (savings and capital), workforce (labour) and technological progress, and that these sources are closely linked and interact with each other (Sharipov, 2015; Solow, 1956). His theory rests on the following assumptions that (Engelbrecht, 1999; Sharipov, 2015; Solow, 1956):

- The level of capital concentration in an economy is dependent on the rate of savings, which implies a direct relationship between the rate of savings and capital concentration. So, as

savings increase, the capital available for productive activities within the economy also increases and vice versa.

- In a stable economy, the rate of population growth affects economic growth. To ensure economic growth under this condition, however, the population growth rate must have a linear relationship with investment; meaning that as population increases, investments must increase as well. In the instance where population rises without commensurate investment, chances are that available capital per worker would be significantly reduced and this tends to negatively impact economic growth. This assumption is supported by the observation that countries with rising population growth rate tend to experience lower capital-labour ratio, which results lower incomes for its citizens. The theory predicts that countries with higher savings coupled with lower population growth rates would grow at a faster pace compared to those with the opposite scenario (Agbloyor et al., 2014; Mankiw et al., 1992).
- Technological advancements increase economic growth. Example mechanisation or automation of production function (helps to reduce wastages in the production process to increase production/output), education (including training and development) of human resources improves efficiency and output. If this is widespread in the economy, it can ultimately lead to economic growth. It further suggests that economic growth will stop without advances in technology (Agbloyor et al., 2014).

The Solow-Swan theory of economic growth is based on exogenous growth, which means economic growth results from factors independent of the economy (Agbloyor et al., 2014; Barro & Martin). At the core, the theory considers concepts such as factors of production, diminishing returns of capital, savings rates, and technological variables to determine economic growth

(Łukasz, 2014; Mankiw et al., 1992; Solow, 1956; Swan, 1956). The neo-classical theory gained prominence in the 1950s due to the strong demand to achieve growth from technological advancement, increased productivity and how the factors of production were harnessed for growth rather than from unused capacity (Barro & Martin; Sharipov, 2015).

Financial Development Theory

The financial development theory suggests that the development of an economy's financial sector—comprising financial markets, institutions, and instruments—plays a crucial role in shaping access to financial services (Agbloyor et al., 2014; Akerlof, 1978; Levine, 1997; Scholtens & Van Wensveen, 2003). Thus, this theory posits that financial inclusion influences poverty and income inequality through both direct and indirect channels (Koomson et al., 2020c).

- Directly, broader access to financial services (banking, insurance, and other financial products) enables individuals and households to meet their transactional needs, invest, and engage in entrepreneurial activities, thereby enhancing income and reducing poverty (King & Levine, 1993a; Koomson et al., 2020c; Rajan & Zingales, 1998).
- Indirectly, financial inclusion supports economic growth by mobilizing resources for investment, creating jobs, and increasing government revenue. This, in turn, allows for expanded public spending on education, healthcare, and social protection—mechanisms that further alleviate poverty and reduce inequality.

Additionally, financial development facilitates greater financial inclusion by expanding access to essential services across all segments of the population (Barr, 2004). As such, financial inclusion is increasingly recognized as a key dimension of financial development, highlighting its role in promoting inclusive economic participation (Le et al., 2019; Nizam, Karim, et al., 2020).

3.2.2 Finance, Economic Growth, Poverty, and Income Equality

The theory links finance to economic development and productivity of an economy (King & Levine, 1992; King & Levine, 1993c; Knight, 2013; Levine, 2021; Schumpeter, 1934). To this, the literature suggest that financial inclusion holds a potential to promote growth and development of the economy (Demirgüç-Kunt & Singer, 2017; Sahay et al., 2015; Van et al., 2021).

The seminal work by Levine (1997) (see Figure 3.1 below) provides a firm theoretical framework to investigate the relationship between finance and growth (Levine, 1997). The premise of the Levine's framework is the suggestion that the costs of acquiring information and making transactions create incentives for the emergence of financial markets and institutions (Levine, 1997). The financial system helps in the mobilisation and effective allocation or redistribution of financial resources between users and suppliers of financial service (that is surplus units of funds and deficit units of funds, insurers and insured or insurance policy-holders, pension funds and buyers of pension funds), facilitates risk management, facilitates exchange, amongst other things (Beck & Levine, 2004; Boyd & Prescott, 1986; Demirguc-Kunt & Levine, 2008; Gupte et al., 2012; Levine, 2021; Levine, 1997, 2003; Levine et al., 2000). The effective functioning of the financial system, thus, assists capital allocation and technological innovation, which ultimately ensures long-run growth within an economy (Beck & Levine, 2004; Boyd & Prescott, 1986; Cojocaru, Falaris, Hoffman, & Miller, 2016; Demirguc-Kunt & Levine, 2008; Gupte et al., 2012; Levine, 1997, 2003; Levine et al., 2000). The lack of an efficient financial sector and financial intermediaries ultimately retard long-run growth within an economy (Levine, 1997).

Figure 3. 1: A Theoretical Approach to Finance and Growth



Source: Levine (1997)

3.3 Empirical Literature: Financial Inclusion, Economic Growth, and Income Inequality

This section discusses empirical studies on the relationship between financial inclusion, economic growth, and income inequality to anchor this study. The empirical literature suggests that there a relationship between finance (financial inclusion) and development indicators such as economic growth and reduction in income inequality (Chen, Zhu, Zhao, Cao, & Cai, 2022; Koomson et al., 2020a; Narayan & Narayan, 2013; Nsiah & Tweneboah, 2023; Ofosu-Mensah Ababio et al., 2021; Sahay et al., 2015; Triki & Faye, 2013; Van et al., 2021).

3.3.1 Relationship between Financial Inclusion and Economic Growth

The literature a relationship between financial inclusion (access to finance) and economic growth (Hannig & Jansen, 2010; Omar & Inaba, 2020a; Ozili, Ademiju, & Rachid, 2023; Seven &

Yetkiner, 2016; Sharma, 2016a). The direction of the relationship between financial inclusion and economic growth have, however, been mixed (Hannig & Jansen, 2010; Levine, 2005; Nsiah & Tweneboah, 2023; Ozili, Ademiju, et al., 2023; Rahman et al., 2020; Seven & Yetkiner, 2016; Sharma, 2016a; Van et al., 2021). To this end, studies found either a positive or negative relationship between finance (financial inclusion) and economic growth (Adeniyi, Oyinlola, Omisakin, & Egwaikhide, 2015; Nsiah et al., 2021; Omar & Inaba, 2020a). Other studies have found the relationship between financial inclusion and economic growth to be indifferent whilst others found that the direction of the relationship depends on factors such as the economy (low-income, medium-income, and high-income) and whether it is in short-run or long-run (Abdelghaffar, Emam, & Samak, 2023; Hannig & Jansen, 2010; Kim, 2016; Rahman et al., 2020; Sani Ibrahim, Ozdeser, & Cavusoglu, 2019; Seven & Yetkiner, 2016). Further, others found that access to finance promoted economic growth only at a certain threshold (Adeniyi et al., 2015; Siddiki & Bala-Keffi, 2024; Zungu, 2022). Accordingly, some of the studies are reviewed below:

Robert G King & Levine (1993a) suggest that the financial system that ensures an efficient flow of funds between financial sector players accelerated growth of an economy. Beck & Levine (2004) found a well-functioning financial system reduced information and transaction costs had a positive relationship economic growth. Levine (2005) also suggested that financial institutions and markets can promote economic growth by means of effective financial intermediation such as mobilising savings and redistributing financial resources between surplus and deficit units of funds. Adding to the landmark study by Joseph Schumpeter on the theory of economic development, Richard Swedberg (2021) concurred with the argument that financial system plays a critical in economic growth because it stimulates innovation and productive financing

(Schumpeter & Swedberg, 2021). Lucas (1988) and Miller (2012) also suggested that prioritising financial sector development ensured a faster route for improving the level of economic growth.

Some recent have also found positive relationship between financial inclusion and economic growth. Sahay et al. (2015) found that increased women financial inclusion promoted economic growth of an economy. Investigating the nexus between financial inclusion and economic growth using vector auto-regression (VAR) models and Granger causality test, Sharma (2016) found evidence to suggest that inclusive finance (through ATM expansion and increase in access to loans and deposits) is key driver of economic growth and development in India. The study, therefore, recommended the deepening and enhancing the operations of the banking institutions to promote financial inclusion in India. Zins & Weill (2016) found evidence to support modern economic theory that finance is good for growth when they found a positive correlation between financial inclusion and growth in 37 African countries. Similarly, Fungacova & Weill (2014) and Park & Mercado Jr. (2018) found a positive relationship between financial inclusion and economic growth in China and 176 economies (including 37 developing Asian economies) respectively. Closer home, Nsiah & Tweneboah (2023) found that financial inclusion improved the gross national income of 20 Sub-Saharan African countries between 2004 and 2020.

On the other hand, some other studies have found an inverse relationship between financial inclusion and economic growth.

Naceur & Ghazouani (2007) used the dynamic panel model with GMM estimators on an unbalanced panel data from 11 MENA region countries and found that bank development had an inverse relationship with economic growth; after controlling for stock market development. A recent study by Adeniyi et. al. (2015) attempted to study the non-linearities in the finance–growth

relationship for Nigeria and how various financial reforms have impacted economic growth in Nigeria. Their study found a negative relationship between financial development and economic growth in Nigeria between 1960 and 2010. Using panel data on a cross-country study, Pradhan et al (2016) investigated the granger causal relationship between insurance and economic growth and found bidirectional relationship between insurance market penetration and economic growth amongst Association of South East Asian Nations (ASEAN) between 1988 and 2012.

More recently, Chen et al. (2022) used the Panel Vector Autoregression model (PVAR) in an attempt to examine the nonlinear links between financial inclusion and economic growth, inequality, and poverty reduction. They found evidence to suggest a relatively weak impact of financial inclusion on economic growth in China from 2004 to 2019. Also, Zungu (2022) adopted the Panel Smooth Transition Regression (PSTR) model (because of the model's ability to cure problems of endogeneity and heterogeneity in econometric models) and found a nonlinear relationship finance and growth in 10 emerging African countries between 1983 and 2020, which confirmed the U-curve hypothesis.

Other studies have found a mixed relationship between the level of financial inclusion and economic growth. Narayan & Narayan (2013) studied 65 developing countries and found evidence to suggest that the financial sector promoted growth. They, however, found that bank credit had inverse relationship with economic growth. Further, they found a weak relationship financial inclusion and economic growth in Middle Eastern countries. Rahman et. al. (2020) attempted to empirically examine how financial development influenced economic growth in Pakistan between 1980 to 2017 period. Using the Markov Switching Model, they found a mixed relationship; where

financial development improved economic growth relatively higher in relatively high-growth regime but was relatively slower in low-growth regime.

The review of literature also show a threshold effect of financial inclusion on economic growth. Adeniyi et al (2015) found that financial development was negatively related to economic growth until a threshold is reached when financial development resulted in economic growth in Nigeria whilst Zungu (2022) found that financial development positively impacted economic growth only when financial development was 60.5 percent of GDP and above, which confirms a threshold in finance–growth association. More recently, Siddiki et. al. (2024) found varying positive relationships between financial inclusion and economic growth in 153 countries; that is to say financial inclusion improved economic growth at different thresholds in the respective countries sampled in their study. They, therefore, recommended that policy and programmes to improve financial inclusion must be country specific and must be based on the developmental stage of the respective country’s financial sector.

This means that the relationship between financial inclusion and economic growth has not been fully studied by the researchers (Adeniyi et al., 2015; Demir, Pesque-Cela, & Murinde, 2020; Nizam, Karim, et al., 2020; Nsiah et al., 2021). It is, however, important that the real relationships between financial inclusion and economic growth in Africa are thoroughly studied because of the important of finance to development in Africa. It is also important to investigate the existence of any threshold effect of financial inclusion on economic growth in Africa.

3.3.2 Relationship between Financial Inclusion and Income Inequality

The literature suggest a relationship between financial inclusion and income inequality (Agyemang-Badu et al., 2018; Bolarinwa & Akinlo, 2021; Kim, 2016; Omar & Inaba, 2020a). The

direction of the relationship between financial inclusion and income inequality has, however, been found to be mixed (Abdelghaffar et al., 2023; Omar & Inaba, 2020b; Park & Shin, 2017; Tita & Aziakpono, 2017).

Kim (2016) used financial accessibility as proxy for financial inclusion and found that improvements in financial accessibility reduced the level of income inequality. Agyemang-Badu et al (2018) found an inverse relationship between financial inclusion and income inequality in 48 African countries. Using single indicators financial services such as number of ATM and commercial banks as proxies for financial inclusion, Neaime and Gaysset (2018) found that financial inclusion eventually reduced the level of income inequality in 8 economies in the Middle East and North Africa (MENA) region from 2002 to 2015. More recently, Ouechtati (2020) found that access to finance improved welfare of households in 53 developing countries between 2004 and 2017. Using unbalanced annual panel data, Omar and Inaba (2020) found that financial inclusion reduced the level of income inequality in 116 developing countries from Asia, Africa, and Latin America. Using panel data, Khan et al (2022) found that improvements in financial inclusion helped to reduce the level of income inequality in 54 African countries.

Other studies have found that financial inclusion did not always reduce income inequality (improve income equality) (Menyelim, Babajide, Omankhanlen, & Ehikioya, 2021; Park & Mercado Jr, 2018; Ratnawati, 2020; Tita & Aziakpono, 2017). To this end, Kim (2016) found that financial inclusion had income inequality reducing-effect in low-income countries only. Tita and Aziakpono (2017) found evidence to suggest that proxies of financial inclusion (such as account ownership and usage by businesses, availability of electronic payments and formal savings) reduced income inequality in Africa but the results was not statistically significant. Studying relationship between

financial inclusion, poverty and income inequality in 176 economies, Park and Mercado (2018) found that financial inclusion was significantly correlated with lower income inequality for all 176 sampled economies. However, they did not find a link between financial inclusion and the 37 developing Asian economies sampled in their study. More recently, Ratnawati (2020) found no impact between financial inclusion and income inequality in 10 Asian countries used in the study whilst Menyelim et al (2021) found that, contrary to the Kuznets curve, financial inclusion only reduced income inequality in 48 African countries in the short-run.

In summary, though most of the empirical studies suggest a positive relationship between financial inclusion and economic growth, some studies have found a negative relationship whilst others have found that the impact of financial inclusion on economic depended on factors such as the income-level of the economy (that is low-income economy, middle-income economy, and high-income economy), the growth regime of the economy (that is high-growth regime and low-growth regime), and the time-span (that is short-term and long-term). The review of the empirical literature also suggest that though financial inclusion can reduce income inequality, financial inclusion can have a negative or indifferent relationship with income inequality. We also found in other studies that financial inclusion impacted income inequality based on the economy being studied whilst other empirical studies suggest a threshold effect of financial inclusion on income inequality. This means there no conclusive study on the relationship financial inclusion, economic growth and income inequality, which warrants deeper and further studies; particularly on Africa.

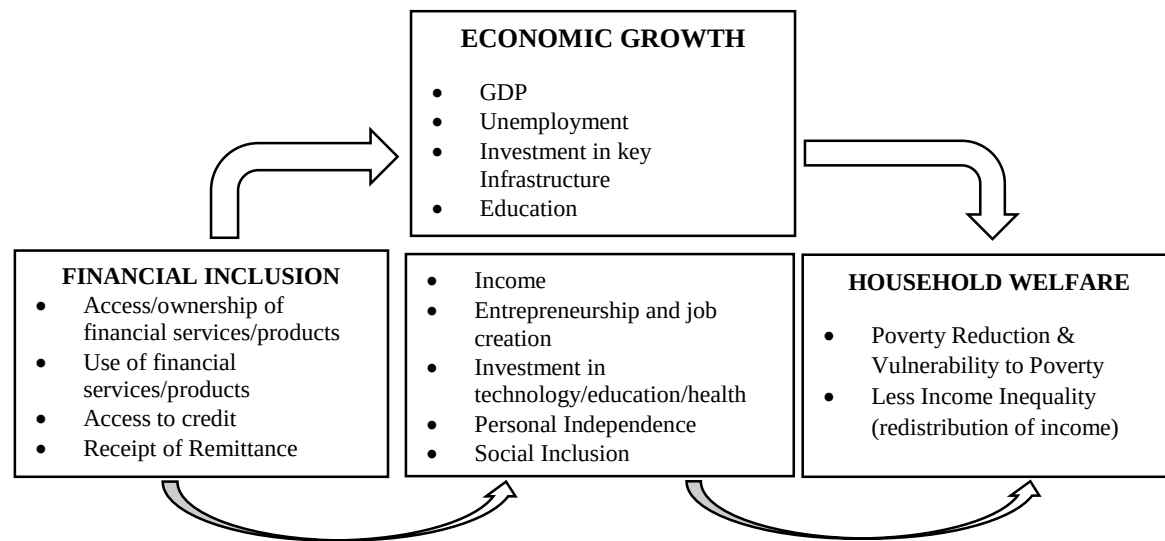
In the light of the above empirical literature review, it is clear that the impact of financial inclusion on economic growth and income inequality is mixed (Hannig & Jansen, 2010; Nsiah et al., 2021; Sharma, 2016a). To the best of my knowledge, no study has examined the relationship between

financial inclusion, economic growth and income inequality using a comprehensive financial inclusion index that was constructed using both bank and insurance data. This study, therefore, significantly fills the literature gap identified above. The empirical literature suggest a threshold effect of financial inclusion on economic growth and income inequality but the review of the existing literature did not produce an empirical study that examined the threshold effect between financial inclusion, economic growth, and income inequality using a comprehensive financial inclusion index like the index used in the study. This study, therefore, fills this literature gap. Overall, this study would confirm or otherwise findings of previous studies. The results of this study would provide fresh insight and empirical evidence, which provide sound foundation in the development of critical programmes that help to promote economic growth and fight against poverty and income inequality in Africa.

3.4 Framework of the Study: Financial Inclusion, Economic Growth and Income Inequality

As discussed in the review of literature above, recent studies found evidence to suggest that financial inclusion promotes economic growth and can help to reduce income inequality within segments of the population (Claessens & Feijen, 2007a; Claessens & Perotti, 2007; Ifediora et al., 2022; Koomson et al., 2020b; Omar & Inaba, 2020a; Sethi & Sethy, 2019; Tsouli, 2022; Van et al., 2021). Figure 3.2 below diagrammatically shows the basic flow through which financial inclusion channels into economic growth and household welfare (income inequality reduction) (Claessens & Feijen, 2007a; Claessens & Perotti, 2007; Koomson et al., 2020b). This provides the framework for the empirical models used to investigate the relationship between financial inclusion, economic growth and income inequality in Africa.

Figure 3. 2: The Relationship between Financial Inclusion and Other Variables



Source: Author's adoption of the framework by Claessens & Feijen (2007) and Koomson et al (2020).

3.5 Data and Methodology

3.5.1 Data and Population of Study

This is quantitative study and gathered data from various credible secondary sources for the study period, which span from 2000 to 2021. This study period was chosen due to data availability. This study sourced the data from the World Development Indicators (WDI) database, AFI, IMF, and United Nations Development Programme (UNDP). The study sought to use all countries on the African continent, however, only 14 countries had the full complement of the data on the variables needed to achieve the objectives of this study. The countries are Botswana, Burkina Faso, Cameroon, Congo DR., Gambia, Kenya, Lesotho, Madagascar, Mozambique, Nigeria, Rwanda, Sierra Leone, Tanzania, and Uganda.

3.5.2 Empirical Model: Financial Inclusion and Economic Growth in Africa

This study adopted the model specification similar to previous studies (Kim et al., 2018; King & Levine, 1993d; Nizam, Karim, et al., 2020; Van et al., 2021) with modifications to suit the available data and Africa. The study uses the real per capita Gross Domestic Product (GDP) growth as the dependent variable, which is regressed against both macroeconomic and microeconomic variables. Additionally, this study favours using real per capita Gross Domestic Product (GDP) growth as the proxy for economic growth over the other proxies for economic growth because it has been widely considered by empirical studies (Beck, Demirguc-Kunt, et al., 2005; Bist, 2018; Demirguc-Kunt & Klapper, 2012; Kim et al., 2018).

Econometric Model Specification:

$$GDPPCG_{it} = \alpha + \beta_1 \ln CAP_{it} + \beta_2 POP_{it} + \beta_3 REM_{it} + \beta_4 \ln DCP_{it} + \beta_5 \ln GXP_{it} + \varepsilon_{it} \quad (3.1)$$

Financial inclusion creates the space for individuals to save in secure institutions and improved opportunities for capital mobilization. This leads to higher savings within the economy and increased capital formation, which can then be channeled into productive investments, stimulating economic growth. Similarly, with access to formal financial services, individuals and small businesses are empowered to engage in entrepreneurial activities. This could involve starting new businesses, expanding existing enterprises, or investing in innovative projects. By enhancing entrepreneurial opportunities, financial inclusion plays a crucial role in driving economic growth through job creation, increased productivity, and innovation. Based on these arguments, equation (3.2) is adjusted to include the influence of financial inclusion on economic growth. The adjusted equation is specified below:

$$GDPPCG_{it} = \alpha + \beta_1 \ln FII_{it} + \beta_2 \ln CAP_{it} + \beta_3 POP_{it} + \beta_4 REM_{it} + \beta_5 \ln DCP_{it} + \beta_6 \ln GXP_{it} + \varepsilon_{it} \quad (3.2)$$

Moreover, inflation has been recognised to influence economic growth. Higher inflation is associated with lower growth because lower real balances reduce the efficiency of factors of production, and because there may be a link between government purchases and the use of the inflation tax (Fisher, 1983; Bruno and Easterly, 1998). Therefore, equation (3.3) is respecified to include inflation. The equation is specified below:

$$GDPPCG_{it} = \alpha + \beta_1 \ln FII_{it} + \beta_2 \ln CAP + \beta_3 POP_{it} + \beta_4 REM_{it} + \beta_5 \ln DCP_{it} + \beta_6 \ln GXP_{it} + \beta_7 \ln INF_{it} + \varepsilon_{it} \quad (3.3)$$

Where: Real GDP (Gross Domestic Product) per capita growth represents economic growth. In line with recent studies, it is the dependent variable in this model (Barro, 2003; Beck, Demirguc-Kunt, et al., 2005; Bist, 2018; Demirguc Kunt & Klapper, 2012; Kendall, Mylenko, & Ponce, 2010; Kim et al., 2018). The independent variables include: FII is our comprehensive financial inclusion index computed in Objective # 1, CAP represents capital, POP represents labour, REM is inward remittances, DCP represents financial development, GXP is government expenditure, and INF represents inflation. These variables are explained later under the description, measurement and expected results section of this study.

3.5.2.1 Hansen Threshold Estimation Technique

The emerging theoretical literature laid emphasis on non-linear relationship between finance and growth. Some of the emerging literature argue that benefits of finance with respect to economic growth and development depend on the scale of finances. This thesis, therefore, hypothesises that there is a threshold level of financial inclusion beyond which financial inclusion would have a significant effect on the economic growth of the host country. Thus, the study modifies the model by accounting for threshold effect of financial inclusion on economic growth, by adjusting equation (3.1) to account for the threshold effect following the Hansen (2000) threshold estimator.

This estimator allows the user to investigate the potential existence of a discrete shift in a static framework.

$$GDPPCG_{it} = \alpha + \beta_1 \ln CAP_{it} + \beta_2 POP_{it} + \beta_3 \ln FII_{it} + \beta_4 \ln F_{it} + \beta_5 REM_{it} + \beta_6 \ln DCP_{it} + \beta_7 \ln GXP_{it} + \varepsilon_{it}, q_i \leq \gamma \quad (3.4)$$

$$GDPPCG_{it} = \alpha + \beta_1 \ln CAP + \beta_2 POP_{it} + \beta_3 \ln FII_{it} + \beta_4 \ln F_{it} + \beta_5 REM_{it} + \beta_6 \ln DCP_{it} + \beta_7 \ln GXP_{it} + \varepsilon_{it}, q_i > \gamma \quad (3.5)$$

where q_i is called the threshold variable and is used to split the sample into two groups, which may be called “regimes”.

To write the model in a single equation, define the dummy variable $d_i(\gamma) = \{q_i \leq \gamma\}$ where $\{ \}$ is the indicator function and set $FII_{it}(\gamma) = FII_{it} d_i(\gamma)$, so that 3.4 – 3.5 equal

$$GDPPCG_{it} = \alpha + \lambda_1 I(\ln FII_{it} \leq \gamma) + \lambda_2 I(\ln FII_{it} > \gamma) + \lambda_3 \ln CAP_{it} + \lambda_4 POP_{it} + \lambda_5 \ln F_{it} + \lambda_6 REM_{it} + \lambda_7 \ln DCP_{it} + \lambda_8 \ln GXP_{it} + \varepsilon_{it} \quad (3.6)$$

where I is an indicator function for the two regimes related to the level of financial inclusion.

Equation 3.6 allows all of the regression parameters to switch between the regimes.

3.5.2.2 Description, Measurement and Expected Results

This section presents description of the variables used in this study, their economic intuitions, and the expected impact of the independent variables on economic growth in Africa.

Dependent Variable

- **Gross Domestic Product per capita (GDP)**

GDP per capita is gross domestic product divided by mid-year population. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. The study uses GDP per capita as proxy for economic because it is a widely used proxy for economic growth and recent studies have adopted

it in studies related to economic growth in Africa in recent studies (Barro, 2003; Beck, Demirguc-Kunt, et al., 2005; Bist, 2018; Demirguc Kunt & Klapper, 2012; Kendall, Mylenko, & Ponce, 2010; Kim et al., 2018).

Explanatory Variables

- **Financial Inclusion (FII)**

Inclusive finance has been identified as central to inclusive growth and development (Ofosu-Mensah Ababio et al., 2021; Triki & Faye, 2013). Thus, financial inclusion, which ensures that all qualified economic agents have access to affordable, available, and access to finance, can improve economic growth of an economy (Omar & Inaba, 2020b; Triki & Faye, 2013; Zins & Weill, 2016). The literature suggest that financial inclusion aids in the achievement of seven (7) of sustainable development goals and recent studies have found evidence to suggest that it also leads to economic growth (Nsiah et al., 2021; Omar & Inaba, 2020b; Zins & Weill, 2016). Like recent studies, this study hypothesis a positive relationship between financial inclusion and economic growth for Africa (Omar & Inaba, 2020b; Zins & Weill, 2016). Financial inclusion index variable used for this study is the comprehensive financial inclusion index constructed in Chapter 2 of this thesis.

- **Capital (CAP)**

Amont other things, the Solow's theory suggests that capital impacts economic growth within an economy (Peterson, 2017; Sharipov, 2015; Solow, 1956). A commonly used proxy for capital is the gross fixed capital formation (formerly gross domestic fixed investment) (Bakari & Tiba, 2022). The capital available for productive activities within the economy increases increases economic growth and vice versa. This study, therefore, expects a positive relationship between economic growth and capital during the study period.

- **Population Growth (POP)**

Solow's theory suggests that economic growth emanates from three (3) sources including workforce (labour) (Peterson, 2017; Sharipov, 2015; Solow, 1956). In a stable economy, the rate of population growth affects economic growth. To ensure economic growth under this condition, however, the population growth rate must have a linear relationship with investment; meaning that as population increases, investments must increase as well. In the instance where population rises without commensurate investment, chances are that available capital per worker would be significantly reduced and this tends to negatively impact economic growth. This assumption is supported by the observation that countries with rising population growth rate tend to experience lower capital-labour ratio, which results lower incomes for its citizens. The theory predicts that countries with higher savings coupled with lower population growth rates would grow at a faster pace compared to those with the opposite scenario (Agbloyor et al., 2014; Mankiw et al., 1992). Population growth and economic development are two of the most pressing social issues confronting the world today (Butler, Wildermuth, Thiede, & Brown, 2020; Kentor, 2001; Mdingi & Ho, 2021).

- **Remittance (REM)**

Remittances (personal inward remittance) are inflow of personal remittances from migrant workers resident outside the country to beneficiaries (particularly to relatives) in the beneficiary country. Receipt of inward remittances increases disposable income of beneficiary individuals/households and it benefits both the individual/household beneficiaries and the economy a number of ways. First, remittances help household beneficiaries to increase their consumption, which boost the economic sector through increased productivity (Agyekum, 2017; Anzoategui, Demirgüç-Kunt, & Pería, 2014; Cazachevici, Havranek, & Horvath, 2020; Chuc et al., 2022; Giuliano & Ruiz-Arranz, 2009). Second, inward remittance represent inflow of foreign exchange for the government and

financial service providers, which can be used in foreign trade transactions (Giuliano & Ruiz-Arranz, 2009). Third, inward remittance provides an alternative investment financing, serves as significant source of external financing for the domestic economy, and helps to address liquidity challenges for the receiving economy (Cazachevici et al., 2020; Fayissa & Nsiah, 2010; Giuliano & Ruiz-Arranz, 2009). This study measures remittance as inward personal remittances received as a percentage of GDP (Agyekum, 2017; Anyanwu, 2011; Cazachevici et al., 2020; Islam, 2022; Meyer & Shera, 2017; Sahoo, Sucharita, & Sethi, 2020) and expects a positive relationship between remittances and economic growth in Africa.

- **Financial Development (DCP)**

The literature suggest that financial development is ensuring a more efficient financial intermediation function of the financial sector (Adu et al., 2013; Bist, 2018; Nouren, 2009; Odo et al., 2016). The theoretical literature alludes to a finance-growth relationship such that financial development can aid economic growth (Barr, 2004). Similar to recent studies, this study adopts domestic credit to the private sector (DCP) as a proxy for financial development (Leitao, 2012; Nsiah & Tweneboah, 2023). DCP refers to the provision of financial resources like loans and trade credits that are advanced to the private sector by financial institutions (Nsiah & Tweneboah, 2023).

The literature suggests that the private sector is the engine of economic growth in an economy because of a numbers of reasons: First, the private sector creates the most employment opportunities within an economy (thereby helping to reduce unemployment), which ensures that individuals and households have disposable income that they can spend on the of consumption of goods and services to spur production and economic growth in the economy. Second, the private sector is the biggest tax payer so once there is growth in business and profitability from increased consumption from economic agents, the government would receive more tax revenue to

grow the economy (Appiah-Adu & Boeh-Ocansey, 2016; Nsiah & Tweneboah, 2023). The significance of the private sector in economic growth can, therefore, not be underestimated (Appiah-Adu & Boeh-Ocansey, 2016; Nsiah & Tweneboah, 2023). Similar to recent studies, therefore, this study hypothesizes that domestic credit to private sector would encourage economic growth (Appiah-Adu & Boeh-Ocansey, 2016; Leita, 2012; Nsiah & Tweneboah, 2023).

- **Government Expenditure (GXP)**

Government contributes to total economic output in various ways (Grossman, 1988). The theoretical literature suggests two schools of thoughts (neo-classical economic and Keynesian economics) explain how government expenditure/spending impacts economic growth in an economy (Nsiah & Tweneboah, 2023). The neo-classical economists argue that demand and supply dictate production, pricing, and consumption of goods and services. Government finances its spending through taxes or domestic borrowing. Domestic borrowing by government (increases public debt and interest rates (cost of funds)) can cause the crowding-out of the private sector because the government can accept the high cost of funds compared to the private sector (Olaoye, Eluwole, Ayesha, & Afolabi, 2020). Crowding-out has a negative effect on an economy because it limits the productive function of the private sector, hence, lowers output from the private sector. Alluding to the multiplier effect theory, however, the Keynesian economists argue that government spending is beneficial to the economy (Nsiah & Tweneboah, 2023). Government spending (provision of public goods) boosts the productivity of the private sector inputs, which increases total output (Grossman, 1988). Similar to recent studies, this study measures government expenditure as a proxied as log of government expenditure (Connolly & Li, 2016; Nyasha & Odhiambo, 2019). This study posits that government expenditure has a positive relationship with economic growth.

- **Inflation (INF)**

Inflation is generally defined as the persistent rise in the price of goods and services over time (Adaramola & Dada, 2020; Umaru & Zubairu, 2012). Inflation represents yearly inflation in the respective African countries (Gokal & Hanif, 2004; Kormendi & Meguire, 1985). The literature suggest that rate of inflation has to be managed and/or kept low due its possible detrimental impact on economic growth and activities in a number of ways (Adaramola & Dada, 2020; Kasidi & Mwakanemela, 2013; Mkhathshwa, Tijani, & Masuku, 2015). First, a state of rising inflation tend to cause rise in general price levels, which reduces the amount of goods and services individuals or households can buy or afford (Ndoricimpa, 2017). Second, rising inflation causes planning and budgeting difficult for businesses, increases cost of funds and production, and reduces profit. That can negatively impact job creation and reduce tax revenue for the government and ultimately repress economic growth of the economy. This study, therefore, follows recent studies by hypothesizing that higher inflation will reduce disposable income of economic agents and undermine the growth of an economy (Adaramola & Dada, 2020; Omar & Inaba, 2020a; Park & Mercado Jr, 2018; Saungweme & Odhiambo, 2021; Tsouli, 2022).

3.5.3 Empirical Model: Financial Inclusion and Income Inequality

In order to test the relationship between financial inclusion and income inequality in Africa, this study estimates equation (3.7) below. Equation (3.7) is based on the empirical study of Omar & Inaba (2020), which also attempted to examine the relationship bewteen financial inclusion and income inequality in developing countries and Mookerjee & Kalipioni (2010) who studied the impact of the financial inclusion (using availability of financial services as proxy) on income inequality in many countries (both developed and developing). This study, however, differs and expands the empirical literature of financial inclusion and income inequality in a number of ways.

Mookerjee & Kalipioni (2010) used availability of financial services (single indicator) as proxy for financial inclusion. Their approach was problematic because financial inclusion is multidimensional in nature so the literature suggest that it is best represented as an index rather than a single indicator or diemnsion. To this end, this study used a comprehensive financial inclusion index (created using both bank and insurance information) thereby enhancing and providing a fresh perspective in the area of financial inclusion. This study, thus, presents a more recent and a wider study period empirical analysis of the relationship between financial inclusion and income inequality. The model is also supported by recent empirical studies that adopted similar models to investigated how financial inclusion influenced income inequality (Abdelghaffar et al., 2023; Chowdhury & Chowdhury, 2023; Khan, Ju, & Hassan, 2019; Tripathi, 2021).

Econometric Model Specification:

$$GINI_{it} = \alpha_0 + \alpha_1 \ln FII_{it} + \alpha_2 Z_{it} + \varepsilon_{it} \quad (3.7)$$

Where GINI Coefficient, which is a commonly used proxy for income inequality in the existing literature, is the dependent variable in this study (Mookerjee & Kalipioni, 2010; Omar & Inaba, 2020b). This is regressed against independent variables that the literature have suggested impact income inequality in an economy. These independent variables include: First, FII, which is the financial inclusion index (computed by author), is the independent variable of interest in this study. Secondly, $Z_{i,t}$, which is made of other controlled variables used by recent studies (Park & Mercado Jr, 2018). These are gross national income per capita (GDP), rate of inflation (INF), rule of law (LAW), government spending (GOS) is government expenditure/GDP ratio, Private sector credit (PSC) is bank credit to private sector/GDP, rate of population growth (POP) and education (EDU). All the variables are explained in detail under description, measurement, and expected results section of this study.

3.5.3.1 Hansen Threshold Estimation Technique

The emerging theoretical literature laid emphasis on a relationship between finance and income inequality. Some of the literature argue that the benefits of finance to income inequality depend on how much access to finances the economic agents have in an economy. This thesis, therefore, hypothesises that there is a threshold level of financial inclusion beyond which financial inclusion would have a significant effect on the income inequality in sub-Sahara Africa. Thus, the study modifies the model by accounting for threshold effect of financial inclusion on income inequality, by adjusting equation (3.7) to account for the threshold effect following the Hansen (2000) threshold estimator. This estimator allows the user to investigate the potential existence of a discrete shift in a static framework.

Adjusting the model in the spirit of Greenwood and Jovanovich (1990), threshold regression is specified below:

$$GINI_{it} = \alpha_0 + \alpha_1 \ln FII_{it} + \alpha_2 Z_{it} + \varepsilon_{it}, q_i \leq \gamma \quad (3.8)$$

$$GINI_{it} = \alpha_0 + \alpha_1 \ln FII_{it} + \alpha_2 Z_{it} + \varepsilon_{it}, q_i > \gamma \quad (3.9)$$

Where q_i is called the threshold variable, and is used to split the sample into two groups, which may be called “regimes”.

To write the model in a single equation, define the dummy variable $d_i(\gamma) = \{q_i \leq \gamma\}$ where $\{ \}$ is the indicator function and set $FII_{it}(\gamma) = FII_{it} d_i(\gamma)$, so that 3.8 and 3.9 equal

$$GINI_{it} = \alpha + \lambda_1 I(\ln FII_{it} \leq \gamma) + \lambda_2 I(\ln FII_{it} > \gamma) + \lambda_3 Z_{it} + \varepsilon_{it} \quad (3.10)$$

Where I is an indicator function for the two regimes related to the level of financial inclusion. Equation 3.10 allows all of the regression parameters to switch between the regimes.

3.5.3.2 Description, Measurement and Expected Results

Dependent Variable

- **Income Inequality (GINI Coefficient)**

Reducing inequality amongst segments of the population goes a long way to help achieve the SDG # 10 (Destek, Sinha, & Sarkodie, 2020). Income inequality, however, continue to be an economic and humanitarian problem globally; particularly in developing economies (Erkişi & Boğa, 2023). Income inequality refers to inequitable distribution of income or relative disproportions in income distribution across segments of the population (Bourguignon, 2004; Ogbeide & Agu, 2015; Omar & Inaba, 2020a; Park & Mercado, 2015).

For this study, income inequality is measured by the Gini coefficient, which is a widely used indicator for income or wealth inequality amongst individuals and households globally (Ceriani & Verme, 2012; Chen, Zhu, Zhao, Cao, & Cai, 2022; Förster et al., 2002; Levine, 2021; Marchetti & Tzavidis, 2021; Mookerjee & Kalipioni, 2010; Nembua, 2014; Omar & Inaba, 2020b; Park & Mercado, 2015). Gini index measures the extent to which the distribution of income among individuals or households within an economy deviates from a perfectly equal distribution or how unevenly income is distributed among segments of the population in an economy (Ceriani & Verme, 2012; Marchetti & Tzavidis, 2021; Mookerjee & Kalipioni, 2010; Turegano & Herrero, 2018; Verma & Giri, 2022; Yitzhaki, 1983). Gini coefficient lies between the range of zero (0) and one (1); where zero (0) (is perfect equality) and one (1) (is maximum or perfect inequality) (Förster et al., 2002; Swart, 2020; Yitzhaki, 1983; Yu et al., 2021).

Explanatory Variables

- **Financial Inclusion (FII)**

The literature suggests a link between access to finance and income inequality (Clarke, Xu, & Zou, 2006; Levine, 2005; Omar & Inaba, 2020a). Recent studies have found evidence to suggest that financial inclusion helps to combat the prevalence of income inequality amongst individual and households (Omar & Inaba, 2020a; Tabash et al., 2024; Turegano & Herrero, 2018; Verma & Giri, 2022) whilst barriers to financial inclusion can significantly increase income inequality (Agyemang-Badu et al., 2018; Clarke et al., 2006; Mookerjee & Kalipioni, 2010; Omar & Inaba, 2020a; Ouechtati, 2020; Tsouli, 2022). This study, thus, hypothesis an inverse relationship between financial inclusion and income inequality in Africa. This study also investigates a possible threshold effect of financial inclusion on income inequality in Africa. FII is the comprehensive financial inclusion index constructed in Chapter 2 of this study.

- **Inflation (INF)**

Inflation is derived using the consumer price index (Omar & Inaba, 2020a). Inflation is a measure of macroeconomic stability (Clarke et al., 2006; Mookerjee & Kalipioni, 2010; Park & Mercado, 2015). The literature suggest that inflation can worsen the level of income inequality within the segments of the population (Omar & Inaba, 2020a). Recent studies suggest that as inflation increases, income inequality widens whilst declining inflation reduces income inequality within the population (Omar & Inaba, 2020a). Others have evidence to suggest that higher inflation leads to lower income inequality (Park & Mercado Jr, 2018; Tsouli, 2022). This study, however, posits that inflation has a direct relationship with income inequality; such that increases in inflation would lead to the widening of income inequality in Africa.

- **Private Sector Credit (PSC)**

By extending the depth and efficiency of the financial system in the allocation of financial resources, financial development quickens growth and reduces inequalities within an economy (Agyekum, 2017; Levine, 2021). Similar to recent studies, private sector credit to GDP is used as proxy for financial development in this study (Levine, 2021; Omar & Inaba, 2020a). The study expects that financial development would reduce the income inequality gap in Africa.

- **Government Spending (GOS)**

The existing literature provide mixed results on the impact of government spending on income inequality (Sidek, 2021). This study, however, acknowledges the importance of government spending to income inequality because of a number of reasons. First, government spending (provision of public goods) boosts the productivity of the private sector inputs, which increases total output (Grossman, 1988). Second, the Keynesian economists argue that government spending is beneficial to the economy (Nsiah & Tweneboah, 2023). Third, the redistribution of income and wealth within a population in an economy can occur not only through taxation but also through government expenditure/spending, hence, government expenditure can be viewed as a tool for redistribution to reduce the income inequality gap (Sidek, 2021). This study uses general government final consumption expenditure, which includes all government current expenditures for purchases of goods and services as a percentage of the gross domestic product, as proxy for government spending (Kavya & Shijin, 2020). The study hypothesise that government spending as a tool for redistribution of resources would help to close the income inequality gap in Africa.

- **Population Growth (POP)**

The literarture suggest that population growth, inequality, and economic development are the most pressing social issues confronting the world today (Butler et al., 2020; Kentor, 2001; Mdingi &

Ho, 2021). Prevalence of income inequality within a population has the potential to cause social dissatisfaction and increases the possibility of social and political unrest (Mdingi & Ho, 2021). There are wider income inequality gaps in Africa, which has a faster growing population rate, compared to the rest of the world (Mdingi & Ho, 2021). The literature suggest that population growth has a link with income inequality (Butler et al., 2020; Kuznets, 2019; Parrado & Kandel, 2010). Recent studies have found evidence to suggest that population growth is positively associated with income inequality (Parrado & Kandel, 2010). For this study, annual population growth rate for year t is the exponential rate of growth of mid-year population from year $t-1$ to t , expressed as a percentage. Population is based on the de facto definition of population, which counts all residents regardless of legal status or citizenship.

- **Rule of Law (LAW)**

Rule of law enhances good governance (Hadfield, Meierhenrich, & Weingast, 2021). Good governance is key to development of an economy because it has the potential to promote economic growth, ensure institutional quality, shared prosperity (income equality), build human capital, and strengthen social cohesion (Hadfield et al., 2021; Nsiah & Tweneboah, 2023; Omar & Inaba, 2020a). Rule of law ensures that legally binding contracts entered into by economic agents are fairly enforced to ensure integrity of contract, protection of property rights, independence of the courts and the judiciary, checks on government and control of corruption, and the presence of political stability (Emara & El Said, 2021; Haggard, MacIntyre, & Tiede, 2008; Haggard & Tiede, 2011; Park & Mercado, 2015). In most African countries, rule of law is enshrined in the country's Constitution, which is expected to encourage good governance (Hadfield et al., 2021).

The World Justice Project (WJP) rule of law index (2021) report shows that African countries have mostly recorded low scores on rule of law, which is a bad sign for the continent (Majhosev, 2021; Nsiah & Tweneboah, 2023). The literature suggest a relationship between the rule of law and the level of income inequality in an economy (Acemoglu & Robinson, 2008; Kunawotor, Bokpin, & Barnor, 2020; Xu, Han, Dossou, & Bekun, 2021). Similar to recent studies, this study posits that weak rule of law will promote higher income inequality whilst stronger rule of law will reduce the income inequality gap in Africa (Kunawotor et al., 2020).

- **Gross National Income (GNI)**

GNI represents the macroeconomic variable of economic growth (Kavya & Shijin, 2020; Nsiah & Tweneboah, 2023; Tabash et al., 2024). Improvements in economic growth is expected to be beneficial to and positively impact all economic agents in an economy (Agyemang-Badu et al., 2018; Kuznets, 2019; Yang & Greaney, 2017). The literature suggest that the means through which economic growth impacts the level of income inequality can be complex (Yang & Greaney, 2017). Accordingly, previous empirical studies found a mixed relationships between economic growth and income inequality (Yang & Greaney, 2017). This study, however, follows the literature that suggest that economic growth reduces the level of income inequality amongst segments of the population (Agyemang-Badu et al., 2018; Omar & Inaba, 2020a). Thus, economic growth is expected to reduce the prevalence of income inequality in Africa.

- **Education (EDU)**

Education is an agent of change and an income equalizer (Shukla & Mishra, 2020). Therefore, expanding education to more individuals and households is key to closing the income inequality gap (Awan et al., 2011; Shukla & Mishra, 2020; Zulfiqar, Chaudhary, & Aslam, 2016). Education decreases the number of destitute individuals (Awan et al., 2011). Also, when an individual is

educated, it is expected that he/she will get employed/increase employability and/or earn higher income, which will increase their disposable income and help to close the income inequality gap (Awan et al., 2011). This study expects that education will reduce income inequality in Africa. In line with recent studies, education is measured as a ratio of gross secondary school enrolment and the total population, regardless of the age (Nsiah & Tweneboah, 2023).

3.5.4 Estimation Method

All of the regression parameters can change between two regimes. The sum of square errors (SSE) for a specific threshold must be calculated at the initial stage. By minimizing the sum of squares, is to be estimated at the second stage.

Then, in order to ascertain whether a threshold effect exists and to test the null hypothesis, a F test is utilized, as follows:

$$F = \frac{SSE_0 - SSE_1(\hat{\gamma})/1}{SSE_1 / n(T-1)} = \frac{SSE_0 - SSE_1(\hat{\gamma})}{\hat{\sigma}^2}$$

There is a threshold effect if the null hypothesis is rejected. Hansen (1999, 2000) proposed a "bootstrap" approach to compute the asymptotic distribution of test statistics using the likelihood ratio test in order to verify the importance of threshold effect, even though the presence of annoyance will cause the F test statistic to follow non-standard distribution. P-values derived from the bootstrap are asymptotically valid since the bootstrap technique achieves the first-order asymptotic distribution.

The optimal technique to create confidence intervals for tests on, according to Hansen (1999), is to create a "no-rejection region" using the likelihood ratio statistic. Thus, to verify the theory

$$\begin{cases} \mathbf{H}_0 : \gamma = \gamma_0 \\ \mathbf{H}_1 : \gamma \neq \gamma_0 \end{cases}$$

We arrive at the test statistic shown below:

$$LR_1(\gamma) = \frac{SSE_0 - SSE_1(\hat{\gamma})}{\hat{\sigma}^2}$$

Again, when $LR_1(\gamma_0)$ is too large and the p-value is below the significance level, the null hypothesis is rejected.

3.6 Empirical Results Analysis

3.6.1 Threshold Relationship between Financial Inclusion and Economic Growth in Africa

This section presents the summary statistics and pairwise correlation matrix of the variables used in the estimation. The also section discusses Hansen's threshold analysis of financial inclusion and economic growth in Africa.

3.6.1.1 Descriptive Statistics

The descriptive statistics of the variables used to estimate the threshold effect of financial inclusion on economic growth and the relationship between financial inclusion and economic growth in Africa are presented and discussed in this section (Table 3.2 below provides the findings).

Table 3. 2: Descriptive Statistics

Variable	Mean	Std. Dev.	Min	Max
GDP	1.947	4.014	-22.383	19.558
FII	0.236	0.131	0.002	0.446
INF	11.623	37.444	-9.616	513.907
GXP	14.597	8.412	0.952	43.484
DCP	13.588	8.342	0.002	39.367
POP	2.563	0.722	-0.402	5.785
REM	4.885	8.343	0	53.826
MSP	25.102	11.37	2.857	59.399
CAP	20.73	7.721	1.097	46.332

Source: Author's own compilations, 2024

Table 3.2 shows that the average GDP per capita growth in SSA over the study period is 1.95 % with a standard deviation of 4.01%; implying that growth in the region has been unstable over the study period perhaps emanating from macroeconomic instability that have plagued the African continent. The average financial inclusion index is 0.24 with a standard deviation of 0.13 which means that financial inclusion in SSA is relatively stable over the study period across the selected countries. It also shows a minimum value of 0.002 and a maximum value of 0.45 for financial inclusion in SSA. However, the average financial inclusion score of 0.24 for the region is low, which makes the region fall in the low financial inclusion grade as per Sarma's financial inclusion grade classification (Sarma, 2008, 2012). The average inflation rate is 11.62% for the sampled countries and a standard deviation score of 37.44%. Overall, the average inflation of 11.62% is in double digits, which suggests that the inflation level was high in the SSA region during the study period. The average remittances to GDP ratio and government expenditure to GDP ratio are 4.88% and 14.59% respectively.

The average value of domestic private sector credit to GDP ratio is 13.59% with a standard deviation of 8.34%. The difference between the minimum value of 0.002 percent and maximum value of 39.37 percent shows growth in the domestic to private sector credit to GDP ratio during the study period, which is a positive sign. This is because access to credit by economic agents who channel same into productive ventures can improve the overall economic growth of the economy (Levine, 2005; Nsiah & Tweneboah, 2023; Omar & Inaba, 2020a). The mean value of broad money to GDP is 25.10% with a standard deviation of 11.37%, which indicates less variability across the sampled countries. The significant difference between the minimum value and maximum value shows an increase in the money supply in the SSA region over the study period, which is a positive sign given the fact that the literature suggest that increase in money can spur

economic growth of an economy (Antwi, Issah, Patience, & Antwi, 2020; Chaitip et al., 2015; Doan Van, 2020). Capital and population growth recorded mean scores of 20.73% and 2.56% respectively.

3.6.1.2 Correlation Matrix

The study applies pairwise correlation matrix to test the presence of the multicollinearity problem in the dataset. Table 3.4 shows the results of correlation matrix of the variables employed in the study. A decision rule provided by recent studies suggest that the correlation between the independent variables should be lower than 0.8 (Alin, 2010; Farrar & Glauber, 1967). It can be observed from that the variables used were below 0.80, which implies there is no multicollinearity in the dataset.

Table 3. 3: Pair-wise Correlation Matrix for Financial Inclusion and Economic Growth

Variables	GDP	FII	INF	GXP	DCP	POP	REM	MSP	CAP
GDP	1								
FII	-0.151	1							
INF	-0.14	-0.169	1						
GXP	-0.022	0.023	-0.116	1					
DCP	-0.059	0.465	-0.163	0.427	1				
POP	-0.002	-0.014	0.066	-0.672	-0.207	1			
REM	-0.051	0.004	-0.069	0.569	-0.07	-0.704	1		
MSP	-0.122	0.491	-0.183	0.447	0.745	-0.27	0.153	1	
CAP	-0.001	0.356	-0.126	0.415	0.343	-0.193	0.184	0.399	1

Source: Author's own compilations, 2024

3.6.1.3 Discussion of the Threshold Effect of Financial Inclusion on Economic Growth

Following recent studies, this study used the Hansen threshold estimation technique to explore the threshold level of financial inclusion that affects economic growth in Africa (Hansen, 1999, 2000;

Nizam, Karim, et al., 2020; Nsiah et al., 2021; Osei & Kim, 2020). This section presents and discusses the results of the Hansen's threshold estimation of the effects of financial inclusion on economic growth in Sub-Saharan Africa.

To determine the number of thresholds, the study sequentially estimates the model with one and two thresholds. Although, the existence of nuisance will result in the F-test statistic to follow non-standard distribution, Hansen (1999, 2000) suggested a "bootstrap" method to compute the asymptotic distribution of test statistics using the likelihood ratio test to test the significance of threshold effects. A bootstrap procedure attains the first-order asymptotic distribution so that p-values constructed from the bootstrap are asymptotically valid. The study, therefore, uses 300 bootstrap replications to test for a single and double threshold effects.

In the test for a single threshold (with H_0 : linear model; H_1 : single threshold model), the F1 statistic of 26.72 (bootstrap p-value = 0.0033) is larger than its critical value at 1% significance level of 13.6136. Therefore, the null hypothesis of no threshold effects is strongly rejected. The implication from the above results is that there is one threshold in the model.

To determine the threshold values, the study estimates the single-threshold model. The threshold estimate is the financial inclusion index (FII) by which the improvement in financial inclusiveness may affect the economic growth. The results indicate that the threshold value is 0.37 for the financial inclusion which shows medium financial inclusion categorised economy. The means that financial inclusion score of 0.37 and above will stimulate economic growth in the selected Sub-Saharan Africa country.

The fixed effects panel threshold regression model is estimated for the single threshold value to determine its influence on economic growth in the selected Sub-Saharan African countries. The F statistic of 3.06, which is significant at the 1% level, for the null hypothesis of all $u_i=0$, confirms that the fixed effect model is appropriate.

Table 3. 4: Hansen’s Threshold Estimate of the Model

Model	Threshold	Lower	Upper	F-statistic	P-value
Threshold 1	0.37385	0.368985	0.374224	26.72	0.0033

Source: Author’s own computation, 2024

Table 3. 5: Threshold Effect of Financial Inclusion on Economic Growth in Africa

Variable	Coefficient	Standard error	t-statistic
CAP	0.0116	0.0436	0.79
POP	-1.3037*	0.6945	-1.88
INF	-0.0235***	0.0064	-3.67
REM	0.0505	0.0659	0.77
LNDCP	-0.3858	0.2746	-1.40
LNGXP	0.0900	0.9514	0.09
LNMSF	-1.6580	1.1463	-1.45
FII(0)	0.5900*	0.3581	1.65
FII(1)	3.9842***	0.8375	4.76
Constant	12.4987***	4.3997	2.84
No. of Observations	330		
No. of Groups	15		
F-test	5.38(0.0000)		
R ²	0.0594		

Source: Author’s own computation, 2024.

Note: *denotes statistically significant at the 10 percent, ** denotes statistically significant at the 5 percent and ***denotes statistically significant at the 1 percent

The threshold results indicate that when FII is less than 0.37 (< 0.37), the coefficient is insignificantly positive, suggesting that economic growth is insensitive to FII as financial inclusion falls below this region. However, when FII is equal to or greater than 0.37 (≥ 0.37), the coefficient

is significantly positive, suggesting that economic growth improves when FII increases beyond 0.37. This implies that the impact of FII on economic growth could have increasing effect as financial inclusion increases, which means that FII exerts significant positive effect on economic growth in Sub-Saharan Africa. In theory, huge benefits are anticipated from global commitments to financial inclusion; including growth in incomes over time (Kim et al., 2018). There are various channels for financial inclusion having effects on the economic growth. There is the real sector channel, whereby broadened access to finance reduces intermediation costs and helps make credit available to support entrepreneurial activities in the economy to create new wealth (Chauvet & Jacolin, 2017; Xu, 2020). Improved access to finance promotes entrepreneurship and entrepreneurs are encouraged to take more risks to increase investment that will contribute to higher growth (Ajide, 2020; Konou, 2023; Yang, Huang, & Gao, 2022). This route allows erstwhile financially excluded individuals to manage and distribute income shocks and provide exposure to innovative financial products that allow them to obtain better education and health care. Overall, financial inclusion benefits the society at large in terms of inclusive growth (Mushtaq & Bruneau, 2019; Nsiah & Tweneboah, 2023; Nsiah et al., 2021; Omar & Inaba, 2020a; Triki & Faye, 2013). Given the fact that the average financial inclusion the sampled countries is lower than the threshold score of 0.37, therefore, there is the need for countries to implement financial inclusion strategies to promote financial inclusion in the respective countries. The positive sign, however, is that, the study showed an upward trajectory in the level of financial inclusion amongst sampled during the study period, which is good for economic growth.

This finding is consistent with recent studies that have also found evidence to suggest that there is a threshold level at which access to finance impacts economic growth (Azam & Khan, 2022; Liu, Luan, Wu, Zhang, & Hsu, 2021; Nizam, Karim, et al., 2020). For example, Liu, et al (2021) found

that the effect of digital financial inclusion on economic growth has a significant internet threshold effect. The results of our study is critical for governments and policymakers and regulators of the financial sector to determine the optimal level or minimum threshold level of financial inclusion that has a favourable impact on economic growth so as to help them in designing the financial sector to support the economic growth agenda (Azam & Khan, 2022; Nizam, Karim, et al., 2020).

Among the control variables, the results indicate that population growth and economic growth are significantly negatively related at the 10 percent level of significance in Sub-Saharan Africa during the study period. The negative sign of the coefficient indicates that as population growth increases economic growth reduces. The magnitude of the coefficient further shows that a percentage point increase in population growth reduces economic growth by 1.3 percentage point in Sub-Saharan Africa. This means that increase in population growth retards economic growth in Sub-Saharan Africa. Rapid population growth can lead to reduced savings rate as a larger proportion of income is spent on consumption and supporting dependents. Moreover, rapid population growth can lead to environmental degradation, which can have long-term negative impacts on economic growth (Bloom & Canning, 2008).

The results further indicate that inflation exerts significant effect on economic growth at the 1 percent level of significance in Sub-Saharan Africa. The negative sign of the coefficient indicates that as inflation increases economic growth reduces. The magnitude of the coefficient further shows that a percentage point increase in inflation reduces economic growth by 0.02 percentage point in Sub-Saharan Africa. This means that inflation retards economic growth in Sub-Saharan Africa. Increases in the rate of inflation create uncertainty about future investment thereby affecting investors' confidence and reduces the volume of investment and consequently reducing

growth in the economy. An increase in the inflationary rate may also lead to capital flight in the economy thereby affecting the growth prospects of Ghana. The findings of this study is constituent with recent studies that found an inverse relationship between economic growth and inflation (Azam & Khan, 2022; Olamide, Ogujiuba, & Maredza, 2022; Pham et al., 2024). Azam and Khan (2022) found that inflation rate exhibit a negative relationship with economic growth in 27 countries (16 developing and 11 developed economies) between 1975 and 2018. Pham et al., (2024) also found evidence to suggest an inverse relationship between inflation and inclusive growth in some selected Asian countries.

The study found that remittances, domestic credit to private sector, government expenditure and money supply all have insignificant effects on economic growth in Sub-Saharan Africa even at the 10 percent level of significance. This means that remittances, financial development, government expenditure and money supply are irrelevant in explaining the variation of economic growth in Sub-Saharan Africa during the study period.

3.6.2 Threshold Effect of Financial Inclusion on Income Inequality in Africa

This section presents the descriptive statistics, pairwise correlation matrix, the regression results, and discusses the threshold level at which financial inclusion will lead to reduction in income inequality in Africa.

3.6.2.1 Descriptive Statistics

The descriptive statistics of the variables used to estimate the threshold effect of financial inclusion on income inequality in Africa are discussed in this sub-section. Table 3.6 provides the findings.

Table 3. 6: Threshold Effect of Financial Inclusion on Income Inequality in Africa

Variable	Mean	Standard Deviation	Minimum	Maximum
GINI	43.491	6.274	34	64.7
FII	0.236	0.129	0.003	0.446
INF	12.166	38.687	-9.616	513.907
PSC	13.839	8.489	0.0016	39.367
GOP	14.879	8.638	0.952	43.484
POP	2.602	0.732	-0.402	5.785
LAW	-0.640	0.539	-1.850	0.671
GNI	1192.99	1291.86	309.91	6319.57
EDU	44.731	27.929	5.557	143.725

Source: Author's own compilations, 2024

GINI coefficient has a mean value of 43.49 with standard deviation of 6.27. The difference between the minimum value of 34 and maximum value of 64.7 is noticeable. Historically, Africa has reported higher income inequality compared to other continents (Chancel et al., 2023; Kaulihowa & Adjasi, 2018). This is because the continent is plagued by lack of inclusiveness in the share of income and wealth (Bhorat, Chelwa, Naidoo, & Stanwix, 2017; Bhorat & Naidoo, 2017). The statistics show that income and wealth inequalities are high in Africa; with top 10 percent Africans accounting for over 54 percent income in Africa (Chancel et al., 2023; Saoudi & Louis-Sarbib, 2023).

The results show that the average financial inclusion index is 0.24 with a standard deviation of 0.13, which means that financial inclusion is relatively stable over the study period across the selected countries. The average inflation rate is 12.17% for the 14 countries with a standard deviation of 38.69%. The difference between the minimum value and maximum value show a high inflation rate in SSA countries during the study period, which is not a good sign because of the negative effect of inflation on household income and the economy as a whole (Muzindutsi & Mjeso, 2018).

The average value of domestic private sector credit to GDP ratio is 13.84 percent with standard deviation of 8.49 percent. The difference between the minimum value of 0.0016 percent and maximum value of 39.37 percent shows a positive sign; that is much more credit could be going to the domestic private sector who can deploy same in production and job creation to help households and the economy. Government expenditure to GDP ratio, population growth, ratio, and rule of law recorded average values of 14.88 percent, 2.60 percent, and -0.64 respectively as well as corresponding standard deviation values of 8.64 percent, 0.73 percent, and 0.54 respectively. GNI has a mean of 1192.99 United States dollars and a standard deviation value of 1291.86 United States dollars. The significant difference between the minimum value of 309.97 and maximum value of 6319.57 shows noticeable positive improvement in GNI amongst the sampled SSA countries during the study period. The region recorded an average value of 44.73% of secondary school enrolment with a standard deviation of 27.93%. The secondary school enrolment in the region is quite low giving the indication that enrolment at secondary school level in the region is relatively low.

3.6.2.2 Correlation Matrix

Table 3.7 shows the correlation matrix of the variables employed in the study. The essence of conducting correlation test is to find out whether the dataset contains problem of multicollinearity (Agyekum, 2017; Farrar & Glauber, 1967; Min, 2019). Per the results presented in Table 3.7 below, our independent variables exhibit correlation scores below 0.8, which indicates the absence of the multicollinearity problem in our dataset.

Table 3. 7: Pair-wise Correlation Matrix: Financial Inclusion and Income Inequality

Variable	GINI	INFL	PSC	GOS	POP	LAW	GNI	EDU	FII
GINI	1.000								
INF	0.010	1.000							
PSC	0.320	-0.160	1.000						
GOS	0.480	-0.120	0.430	1.000					
POP	-0.400	0.070	-0.210	-0.670	1.000				
LAW	0.380	-0.200	0.480	0.510	-0.390	1.000			
GNI	0.560	-0.090	0.520	0.290	-0.350	0.530	1.000		
EDU	0.160	-0.070	0.010	-0.090	-0.120	0.030	0.350	1.000	
FII	-0.220	-0.170	0.470	0.020	-0.010	0.110	0.180	0.310	1.000

Source: Author's own compilations, 2024

3.6.2.3 Analysis of the Threshold Effect of Financial Inclusion on Income Inequality

The economic literature has long debated the impact of access to finance on income inequality (Park & Mercado Jr, 2018). Following the approach used in recent studies, this study used the Hansen threshold estimation technique to explore the threshold level at which financial inclusion affects income inequality in Africa (Hansen, 1999, 2000; Nizam, Karim, et al., 2020; Nsiah et al., 2021; Osei & Kim, 2020). This section presents and discusses the results of the threshold effect of financial inclusion on income inequality in the sampled SSA countries. The results are presented in Table 3.8 and Table 3.9.

To determine the number of thresholds, the study sequentially estimates the model with one and two thresholds. In the test for a single threshold (with H_0 : linear model; H_1 : single threshold model), the F1 statistic of 26.71 (bootstrap p-value = 0.0867) is larger than its critical value at 10% significance level of 23.8124. Therefore, the null hypothesis of no threshold effects is weakly

rejected. However, the F2 statistic in the test for a double threshold (with H_0 : single threshold model; H_1 : double threshold model) was not statistically significant even at the 10 percent level of significance. The implication from the above results is that there is one threshold in the model.

To determine the threshold values, the study estimates the single-threshold model. The threshold estimate is the financial inclusion index (FII) by which the improvement in financial inclusiveness may affect the income inequality in Sub-Sahara Africa. The results indicate that the threshold value is 0.05 for the financial inclusion. The financial inclusion of 0.05 means that financial inclusion above this value will reduce income inequality in the sampled SSA countries. The fixed effects panel threshold regression model is estimated for the single threshold value to determine its influence on income inequality in the selected Sub-Saharan African countries. The F statistic of 62.75, which is significant at the 1% level, for the null hypothesis of all $u_i = 0$, confirms that the fixed effect model is appropriate. The results are presented in Table 3.8.

The threshold results indicate that when FII is less than 0.05 (< 0.05), the coefficient is significantly negative, suggesting that income inequality reduces as FII falls below this region. Also, when FII is equal to or greater than 0.05 (≥ 0.05), the coefficient is significantly negative, suggesting that income inequality reduces when FII increases beyond 0.05. However, the magnitude of the reduction in income inequality is greater when $FII \geq 0.05$, which means financial inclusion score above the 0.05 threshold is required to help to reduce income inequality faster in Africa. Our result is consistent with recent studies that also found that financial inclusion threshold matters for income inequality (Kebede, Naranpanawa, & Selvanathan, 2023).

Table 3. 8: Hansen's Threshold Estimate of the Model

Model	Threshold	Lower value	Upper value	F-statistic	P-value
Threshold 1	0.0466	0.0432	0.0467	26.71	0.0867

Source: Author's own computation, 2024

Table 3. 9: Threshold Effect of Financial Inclusion on Income Inequality in Africa

Variable	Coefficient	Standard error	t-statistic
INF	0.000004	0.0001	0.04
LnPSC	0.0040	0.0038	1.05
LnGOS	-0.0101	0.0128	-0.79
POP	0.0347***	0.0089	3.91
LAW	-0.0513***	0.0162	-3.16
LnGNI	0.0849***	0.0293	2.91
LnEDU	0.0083	0.0102	0.81
FII(0)	-0.0412***	0.0049	-8.47
FII(1)	-0.0633***	0.0068	-9.36
CONSTANT	2.9582***	0.2104	14.06
No. of Observations	330		
No. of Groups	15		
F-test	17.10		
	(0.0000)		
R ²	0.0443		

Source: Author's own computation, 2024.

denotes statistically significant at the 10 percent, * denotes statistically significant at the 5 percent and *denotes statistically significant at the 1 percent*

Economic literature has long debated the impact of access to finance on income inequality (Park & Mercado Jr, 2018). Comparison of the coefficients of pre and post threshold values indicates that the effect of financial inclusion on income inequality is higher above the threshold value, and the coefficients are statistically significant, and this indicates a higher return from financial inclusion after the threshold level of financial inclusion. Financial inclusion can reduce inequality by providing opportunities for investment to the most vulnerable. Barriers to financial services

reduce access to financing for entrepreneurs and increase startup costs for poorer and less-skilled individuals to invest in more productive economic activities.

Financial inclusion can reduce inequality through consumption smoothening and by affecting the labour market and wages. The most vulnerable workers tend to respond to income shocks by increasing labour supply to smoothen consumption; putting downward pressure on wages (Blundell, Pistaferri, & Saporta-Eksten, 2016). Without existing savings (buffer) or the possibility to borrow, a negative shock on productivity, for example, will depress the equilibrium wage (Jayachandran, 2006). Availability of financial services can promote investments; including from small businesses (see IMF 2019), with the potential to increase employment (including less-skilled workers), which helps to reduce income inequality. A more inclusive financial system also offers opportunities to invest in education (that is helping people to increase their human capital), which ultimately can help to increase their wages and reduce overall income inequality.

The results validate the theoretical postulation of Greenwood & Jovanovic (1990) and is consistent with recent studies that investigated how financial inclusion works to close income inequality gap (Altunbaş & Thornton, 2020; Greenwood & Jovanovic, 1990; Honohan, 2008; Khan, Khan, Sayal, & Khan, 2022; Park & Mercado Jr, 2018; Tsouli, 2022; Zhang & Naceur, 2019). Overall, the study finds that access to finance helps to reduce income inequality; at the certain threshold.

Population growth is positively related to income inequality at the 1 percent level of significance in Sub-Saharan Africa. The positive sign and magnitude of the coefficient show that a percentage point increase in population growth increased income inequality by 0.03 percent, which means that population growth widen income inequality in Sub-Saharan Africa during the study period. An increase in population growth results in the spread of household's income over a larger number

of individuals and lowers per capita income and disposable income left for other household needs (Nsiah et al., 2021; Tsouli, 2022). The distribution of labour remuneration is more unequal (Kuznets, 1963), so high fertility rates can lead to income inequality. Butler et al (2020) project that increase population in Africa would hinder economic development. Our results is consistent with recent studies that found evidence to suggest that population growth increases income inequality (Anyanwu, 2016; David, 2021; Okojie & Shimeles, 2006; Peterson, 2017; Seabela, Ogujiuba, & Eggink, 2024; Ullah, Kui, Ullah, Pinglu, & Khan, 2021). Anyanwu (2016) found that population growth promoted income inequality in the Southern Africa region whilst Ullah et. al., (2021) found that increase in population size resulted in an increase the level of income inequality amongst 64 countries from 2003 to 2018.

Rule of law exhibits a negatively significant effect on income inequality at the 1 percent level of significance. Enforcement of law and order ensure that funds and development interventions earmarked for the development of the nation; especially in the rural areas where the majority of the poor live, will be administered appropriately. Hence, it limits the level of corruption in the society since public officials fear being persecuted for embezzlement of funds. Thus, rural forks and the poor benefit fully from government developmental projects, which improve their standard of livings thereby helping to close the income inequality gap between segments of the population (poor and non-poor). Our result is consistent with recent studies that found a negative relationship between rule of law and income inequality (Bhagat, 2020; Islam & McGillivray, 2020; Nam, Frijns, & Ryu, 2024; Park & Mercado Jr, 2018; Tomita, 2023). Park and Mercado (2018) found evidence to confirm that stronger rule of law lowered income inequality across 176 economies between 2004 and 2012. Also, Islam and McGillivray (2020) found that improvements in and adherence to rule of law correlated with less wealth inequality. More recently, Tomita (2023) found

evidence to suggest that strengthening the rule of law in countries with French legal origins resulted in improvements in the redistribution function thereby reducing economic inequality whilst Nam et al, (2024) found that enhancements in rule of law (policies and regulations) help to a decrease in inequality.

GNI exhibits a positive and significant at 1 percent relationship with income inequality in Africa during the study period. The coefficient from the estimation shows that a dollar increase in GNI increases income inequality by 0.0849 percent. Among the control variables, the study found that inflation, private sector credit to GDP ratio, government expenditure and education exerts insignificant effects on income inequality even at 10 percent level of significance in Sub-Saharan Africa. This means that inflation, private sector credit to GDP ratio, government expenditure and education do not contribute to the reduction in income inequality in Sub-Saharan Africa.

3.7 Summary, Conclusions, and Recommendations

3.7.1 Introduction

This study investigated the threshold effect of financial inclusion on economic growth and income inequality in 14 sub-Saharan African countries. The section summarises and concludes the findings of the study. It also offers appropriate policy recommendations generated out of the empirical results for implementation in Africa and other developing economies. The section is divided into the following sub-headings, summary of findings, conclusions, and recommendations.

3.7.2 Summary of the Findings

The study conceptualized that financial inclusion can promote economic growth and reduce income inequality in Africa and it explored any possible threshold that financial inclusion impacts economic growth and income inequality in the sampled countries used in this study. The Hansen

threshold regression model was used to examine the nature of the relationship between financial inclusion and economic growth as well as the nature of relationship between financial inclusion and income inequality of the selected countries in Sub-Saharan Africa. The following are the summary of the findings.

3.7.2.1 Threshold Effect of Financial Inclusion on Economic Growth

To investigate the threshold effect of financial inclusion on economic growth in Africa, this study adopted economic models used by recent studies with modifications to suit the available data and Africa (Kim et al., 2018; King & Levine, 1993d; Nizam, Karim, et al., 2020; Tsouli, 2022; Van et al., 2021). In line with recent studies, this study used GDP per capita (the proxy for economic growth) as the dependent variable and estimated regression using a number of independent variables; including the financial inclusion index as the independent variables of interest. The financial inclusion index here was the comprehensive financial inclusion index constructed in chapter 2 of this study. In addition, the study used capital, population growth, inflation, remittance, domestic credit to private sector, government spending, and money supply as the other independent variables. To achieve the objective of investigating threshold effect of financial inclusion on economic growth in Africa, the study deployed the Hansen threshold estimation technique (Hansen, 1999, 2000).

Subsequent to the estimation, the study found that the relationship between financial inclusion and economic growth is significantly positive at a threshold of 0.37 and beyond during the study period. The threshold results indicate that when FII is less than 0.37 (< 0.37), the coefficient is insignificantly positive, suggesting that economic growth is insensitive to FII as financial inclusion falls below this region. However, when FII is equal to or greater than 0.37 (≥ 0.37), the coefficient

is significantly positive, suggesting that economic growth improves when FII reaches and/or increases beyond 0.37. This level ensures that FII exerts significant positive effect on economic growth in Sub-Saharan Africa.

In the theory, huge benefits are anticipated from global commitments to financial inclusion, including economic growth over time. Creating an effective financial sector (financial intermediation process) reduces intermediation costs and information asymmetry. There are various channels (such as consumption and production) for financial inclusion to impact economic growth (Goel & Sharma, 2017). First, broadening access to finance makes credit available to support entrepreneurial activities in the economy helps to create new creates jobs for individuals and households who get disposable income for consumption within the economy. This gives erstwhile financially excluded individuals and households disposable income to be able to obtain better education and health care. Second, the improved access to finance encourages entrepreneurs to take more risks to increase investment to create new wealth and profitability, which increases tax revenue to government and ultimately will contribute to higher growth.

The study further examined the relationship between economic growth and other factors that the existing literature suggest impact economic growth. First, the study found that population growth negatively affects economic growth. Second, the results show inflation exhibits a negative, significant relationship, which means the rising rate of inflation repressed economic growth during the study period. Lastly, the study finds that remittance, capital, domestic credit to private sector, government spending, and money supply insignificantly impacted economic growth during the study period.

3.7.2.2 Threshold Effect of Financial Inclusion on Income Inequality

To investigate the threshold effect of financial inclusion on income inequality in Africa, this study adopted economic models used by recent studies with modifications to suit the available data and African context (Demir et al., 2020; Omar & Inaba, 2020a). The study adopts GINI coefficient, which is a widely used proxy for income inequality, as the dependent variables (Demir, Pesqué-Cela, Altunbas, & Murinde, 2022; Demir et al., 2020; Omar & Inaba, 2020a; Tsouli, 2022). The comprehensive financial inclusion index, which was constructed from chapter 2 of this study, was the independent variable of interest in the study (Demir et al., 2022; Demir et al., 2020; Omar & Inaba, 2020a). The other independent variable included inflation, domestic credit to private sector, government spending, population growth, rule of law, gross national income, and education. To achieve the objective of investigating threshold effect of financial inclusion on income inequality in Africa, the study deployed the Hansen threshold estimation technique in the estimation (Demir et al., 2020; Hansen, 1999, 2000).

The results of the study finds that financial inclusion significantly reduced income inequality in Africa during the study period. The study finds that financial inclusion reduced income inequality faster when it reached threshold equal to or greater than 0.05 (≥ 0.05). Financial inclusion can reduce inequality by providing opportunities for investment to the most vulnerable. Barriers to financial services reduce access to financing for entrepreneurs and increase startup costs for poorer and less-skilled individuals to invest in more productive economic activities. As a consequence, these individuals are likely to remain trapped in subsistence activities characterized by low profitability and income gap relative to the wealthier share of the population or those with access to financial services. Also, financial inclusion can reduce inequality through consumption smoothening and by affecting the labour market and wages.

Examining the relationship between income inequality and the other independent variables used in the study, the study finds that population growth fueled income inequality, rule of law reduced income inequality, and GNI significantly influenced income inequality. Inflation, domestic credit to private sector, government spending and education were, however, insignificantly related with income inequality in Africa during the study period.

3.7.3 Conclusion

Firstly, the study found that financial inclusion has threshold effect on economic growth on selected countries within the Sub-Saharan African region. The threshold level that increases economic growth in Sub-Saharan Africa has been estimated to be equal or greater than 0.37. The study results show that all the sampled countries recorded average financial inclusion scores below threshold, which is not a positive sign. The selected countries that have reached the threshold level during the study period enjoyed improvement in their economic growth during those respective years. During the study, the level of financial inclusion show an increasing trend in all the sampled countries and it can be expected that the countries would reach the financial inclusion threshold score of 0.37 soon, which is positive outlook for economic growth in the sampled countries. The study finds that remittance and inflation are positively and negatively related to economic growth, respectively, during the study period whilst domestic credit to private sector, government spending, and money supply insignificantly impacted economic growth in Africa during the study.

Second, the study finds that financial inclusion index that is equal and greater than 0.05 reduced income inequality faster during the study period. Hence, it is concluded that the selected countries that have reached this threshold level are enjoying in terms of reducing the income gap between the poor and non-poor. The good sign is that all the sampled countries recorded average financial

inclusion score higher than that threshold score (with the least average score being 0.18 for a country) during the study period. This is a positive outlook for the fight to reduce income inequality in Africa and shows that access to finance is contributing its quota to this fight. Additionally, factors such as economic growth, rule of law, and population growth also influenced income inequality in Africa during the study period.

3.7.4 Recommendations and Policy Implications

The empirical results of this thesis offer several recommendations policy implications as below:

Firstly, the findings offer empirical evidence of a strong correlation between greater financial access and higher economic growth when the level of financial inclusion reaches a threshold of 0.37 and beyond. The study, therefore, recommends governments of African countries and the regulators of the financial sectors should implement the necessary regulatory interventions and policies that would improve the level of financial inclusion and address barriers to financial inclusion in order to ensure improvements in the level of financial inclusion to reach 0.37 (and beyond) threshold to promote economic growth. Additionally, the study results suggest that managers of the economies must manage inflation (reduce inflation) and economic agents must attract more inward remittances to significantly improve economic growth in Africa. Money supply must be monitored and controlled so as not to fuel inflation, which can discourage economic growth, and government expenditure must be channeled into productive sectors of the economies and avoid waste within the economies to promote economic growth.

Secondly, the findings show a significant positive relationship between financial inclusion and income inequality in Africa during the study period. We find that financial inclusion reduced the income inequality gap faster when the financial inclusion in the country reached a threshold of

0.05 and beyond. The positive sign is that all the sampled countries recorded average scored higher than the threshold score, which means that financial inclusion reduced income equality faster during the study period. Additionally, factors such as rule of law reduced income inequality in Africa, GNI widen income inequality in Africa whilst population growth, domestic credit to private sector, government spending, and education did not influence income inequality in Africa during the study period. This means that governments of these countries need to implement policies and programmes that ensure shared and inclusive prosperity across the segments of the population (irrespective of the region or demographic divide), and improve the rule of law to reduce income inequality in Africa.

CHAPTER 4

THE EFFECT OF FINANCIAL INCLUSION ON WOMEN EMPOWERMENT IN AFRICA

4.1 Introduction

Empowerment is not easy to define but it is commonly seen as the process through which individuals and households acquire social, economic and political ability to take own decisions for their well-being and liberate themselves from injustices in the society (Hennink, Kiiti, Pillinger, & Jayakaran, 2012; Manuere & Phiri, 2018; Svensson, 2020; Wallerstein, 1992). Women and the girl-child, who form majority of the world population, tend to be more prone to being less-empowered and marginalised in many respects such as health, economic, social and politics, compared to men (Adjei, 2015; Chaudhary & Kumari, 2022). Women empowerment has, therefore, received significant global attention in the past three (3) decades; particularly in developing countries (Adjei, 2015; Hennink et al., 2012; Wanjala, 2021).

Women empowerment is often seen as a means through which women become able to become self-sufficient, to assert their independent right to make choices and to control valued resources that will enable them to challenge and eliminate their own subordination (Adjei, 2015; Keller & Mbewe, 1991). Women empowerment allows women the ability to freely make their own choices (Field, Pande, Rigol, Schaner, & Troyer Moore, 2021; Siddik, 2017b). Empowering women is crucially important not just for their well-being but it benefits the growth and development of the society and the entire economy (Al-Dajani & Marlow, 2013; Sharma & Varma, 2008). However, attempts to promote women empowerment and gender equality have been hindered by a various constraints at both the global, national, and local levels (Wanjala, 2021). This presents a global challenge in that it counters the fight against inequality and puts the chance of achieving the

sustainable development goals (particularly goal # 5 that aims to achieve gender equality and empowering all women and girls across the world) at risk (Arshad, 2023; Kaltenborn, Krajewski, & Kuhn, 2020; Klapper et al., 2016).

The literature suggest that access to financial services (financial inclusion) can improve well-being of individuals and promote their wealth accumulation and propensity (Brown, Cookson, & Heimer, 2019; Célerier & Matray, 2019; Demirgüç-Kunt et al., 2013; Omar & Inaba, 2020a; Svotwa, Makanyeza, & Wealth, 2023; Triki & Faye, 2013). This means that financial inclusion has the potential to empower individuals and households; including women and the poor (Aziz, Sheikh, & Shah, 2022; Esmaeilpour Moghadam & Karami, 2023; Hennink et al., 2012). The literature suggest that having access to the formal financial system can greatly enhance women economic empowerment (Ashraf et al., 2010; Nsiah et al., 2021). Also, financial access can result in improvements in the overall social and physical wellbeing of women, hence, help to close the inequality gap between men and women (Cabeza-García et al., 2019). The empirical literature, however, suggest the persistent presence of gender gap in financial inclusion; with women being relatively less financially included compared men (Cámara & Tuesta, 2014; Demirgüç-Kunt et al., 2013; Esmaeil Zaei, Kapil, Pelekh, & Teimoury Nasab, 2018; Timu & Kramer, 2023; Yaumidin et al., 2017; Zeier Röschmann, 2018).

Women empowerment through financial inclusion has, therefore, received significant attention among international development organisations, governments (policymakers), and researchers (Aziz et al., 2022; Esmaeilpour Moghadam & Karami, 2023). There is a growing interest in women empowerment and financial inclusion, but a review of the literature shows very few empirical studies have been conducted with reference to how financial inclusion impacts women's empowerment in Africa. This study seeks to close this significant literature gap.

This study is important because of a number of reasons. First, women account for more than half of the global population but the literature suggests that they are, however, more likely to be excluded from formal financial services compared to men (Ashraf et al., 2010; Yin et al., 2013). Financial exclusion of women and/or a lack of access to finance can potentially harm the economy as a whole because women are the majority of African adults (Aterido, Beck, & Iacovone, 2013). Second, previous studies found mixed relationships between women's empowerment and financial inclusion (Maruta, Edjigu, & Kassa, 2023). Some studies find that women's empowerment can improve the level of financial inclusion amongst women and improve their wellbeing (Arshad, 2023; Ashraf et al., 2010; Aziz, Sheikh, & Shah, 2022; Siddik, 2017; Swamy, 2014) whereas others found that financial inclusion can be detrimental and increase indebtedness and poverty amongst women (Guérin, Labie, & Servet, 2015; Stewart et al., 2012). This study helps to close gaps in the empirical literature on women's empowerment and financial inclusion in Africa. Thus, this study addresses this gap in literature by using a more comprehensive financial inclusion index to examine the relationship between financial inclusion and women empowerment in Africa. The study also investigates the short and long-term impact of financial inclusion on women empowerment.

4.2 Gender Inequality, Sustainable Development Goals and Women Empowerment in Africa

4.2.1 Gender Inequality and Sustainable Development Goals

For centuries, the cultural norms and the socialisation in underdeveloped and developing countries have tended to condition boys and girls to behave in certain ways and to play different roles within the society (Braverman-Bronstein et al., 2023; Carrasco Rueda, González Gijón, & Martínez Heredia, 2023; Eliasson, 2015; Njogu & Orchardson-Mazrui, 2013). For example, from an early

age, the girl is conditioned to accept that motherhood, taking care of the family, and keeping the home as the most important roles of female within the society (Braverman-Bronstein et al., 2023). This is further enforced by the educational system and employment opportunities for women (such as nursing, care-givers, nursery teachers, and housekeeping and cleaning jobs) (Braverman-Bronstein et al., 2023). On the other hand, the boy is raised to assert dominance over the girl and 'be man of the house' (Braverman-Bronstein et al., 2023). This has created gender inequality against women, which has resulted in women being significantly less empowered compared to men (Adera & Abdisa, 2023; Braverman-Bronstein et al., 2023; Santos Silva & Klasen, 2021).

Gender inequality, which is significantly pervasive in developing economies, has received significant attention in recent decades (Adera & Abdisa, 2023; Jayachandran, 2015; Kabeer, 2005). The concept of gender inequality is complex to define but recent studies have suggested that gender inequality is any exogenously imposed difference between male and female in the society (Santos Silva & Klasen, 2021). The literature suggest that within a given population, women (including the girl-child) tend to suffer inequality in various forms compared men; particularly in developing economies (Adera & Abdisa, 2023; Jayachandran, 2015; Patel & Kariel, 2021).

The literature suggest that more women in developing economies tend not to have absolute control and rights over their resources (both economic and financial), decisions, and even their own bodies compared to men (Adera & Abdisa, 2023; Kabeer, 1999, 2005, 2012). This makes women depend on the men, which negatively impacts the ability to take independent decision as well as make women susceptible to abuse from men (Adera & Abdisa, 2023; Kabeer, 1999, 2005, 2012). Also, women tend to be paid less for the same piece of work compared to men. All of these deepen and continue the cycle of gender inequality against women in developing countries (Adera & Abdisa,

2023; Dahal, Joshi, & Swahnberg, 2022; Demirgüç-Kunt et al., 2013; Firmansyah & Sihaloho, 2021; Heise, 2011; Hughes, Bolis, Fries, & Finigan, 2015; Kabeer, 1999, 2005, 2012; Tang, 2022).

Gender inequality is a global issue because it tends to deepen the prevalence of hunger, poverty, and income inequality amongst women (Demirgüç-Kunt et al., 2013; Rui & Nie, 2021). Addressing the issue of gender inequality is, therefore, critically important because it is not just moral or social issue but an economic challenge (Demirgüç-Kunt et al., 2013; Firmansyah & Sihaloho, 2021; Newman, 2017; Santos Silva & Klasen, 2021). Thus, both theoretical and empirical studies suggest that gender inequality remains a barrier to development; especially when it persists over the long run (Demirgüç-Kunt et al., 2013; Firmansyah & Sihaloho, 2021; Newman, 2017; Santos Silva & Klasen, 2021).

The the global fight to end gender inequality has been identified as a human rights issue and has received increased attention in development finance and economics (Fanta & Mutsonziwa, 2016b; Kaltenborn et al., 2020; Triki & Faye, 2013). To this end, Goal # 5 of the Sustainable Development Goal (SDGs) has been dedicated to achieving gender equality and empowering all women and girls across the world (Kaltenborn et al., 2020; Klapper et al., 2016). Amongst other things, SDG # 5 is expected to:

- End all forms of discrimination against all women and girls everywhere
- Eliminate all forms of violence against all women and girls in the public and private spheres; including trafficking as well as sexual and other types of exploitations
- Eliminate all harmful practices, such as child labour, early and forced marriage and female genital mutilation

- Recognise and value unpaid care and domestic work through the provision of public services, infrastructure and social protection policies as well as the promotion of shared responsibility within the household and the family; as nationally appropriate
- Ensure women's full and effective participation as well as equal opportunities in leadership at all levels of decision-making in political, economic and public lives

The literature suggest that women empowerment and gender equality (gender inclusiveness) are closely related as their combined effect helps to achieve improved level of human development (Kaltenborn et al., 2020; Newman, 2017).

4.2.2 Financial Inclusion and Women Empowerment

The need for a paradigm shift towards inclusive growth and development where everyone equally contributes and benefits has received increased attention in recent times (Dabla-Norris & Srivisal, 2013; Omar & Inaba, 2020a; Triki & Faye, 2013). This is because growth has to be inclusive to be sustainable (Nsiah & Tweneboah, 2023; Triki & Faye, 2013). The literature suggest that access to finance is critical to achieving inclusive growth (Adedokun & Ağa, 2023; Demirgüç-Kunt et al., 2013; Ghosh & Vinod, 2017; Triki & Faye, 2013; Zins & Weill, 2016). The literature suggest that access to financial services (financial inclusion) can improve an individuals' well-being, wealth accumulation and propensity (Brown et al., 2019; Célerier & Matray, 2019; Demirgüç-Kunt et al., 2013; Omar & Inaba, 2020a; Svotwa et al., 2023; Triki & Faye, 2013). Greater access to finance can reduce income inequality and the prevalence of poverty within the economy; particularly amongst women and the pro-poor members of the society (Dabla-Norris & Srivisal, 2013; Liu et al., 2021; Nsiah & Tweneboah, 2023; Park & Mercado Jr, 2018; Ratnawati, 2020).

Notwithstanding the crucial beneficial role of finance to economic agents and the entire economy, it is estimated that there are still about 1.7 billion financially excluded adults globally; (Bekele, 2023; Ezzahid & Elouaourti, 2021; Nsiah & Tweneboah, 2023; Park & Mercado Jr, 2018; Svotwa et al., 2023). It is further estimated that 56 percent of the financially excluded are women in developing countries (Svotwa et al., 2023). This means that women are more financially excluded compared to men in developing countries (Chen et al., 2023; Demirgüç-Kunt et al., 2013; Fanta & Mutsonziwa, 2016b; Ghosh & Vinod, 2017). This indicates a gender gap in financial inclusion (Adegbite & Machethe, 2020; Chen et al., 2023; Demirgüç-Kunt et al., 2013; Fanta & Mutsonziwa, 2016b). Financial inclusion gender gap in financial inclusion can be operationally defined as the difference in the level of financial inclusion between men and women (Chen et al., 2023; Demirgüç-Kunt et al., 2013; Fanta & Mutsonziwa, 2016b; Svotwa et al., 2023). The empirical literature suggest that gender gap in financial inclusion is prevalent in developing economies like Africa (Adegbite & Machethe, 2020; Demirgüç-Kunt et al., 2013; Fanta & Mutsonziwa, 2016b; Sakyi-Nyarko, Ahmad, & Green, 2022).

The literature suggest that gender gap in financial inclusion represents a global challenge (Adegbite & Machethe, 2020; Chen & Volpe, 2002; Chen et al., 2023; Ghosh & Vinod, 2017; Sakyi-Nyarko et al., 2022). This is because gender gap in financial inclusion can significantly restrict the contribution of women to economic growth and development, fuel inequality against women, lead to prevalence of poverty amongst women, and ultimately repress economic growth and development of an economy (Aghion & Bolton, 1997; Demirgüç-Kunt et al., 2013; Galor & Zeira, 1993; Ghosh & Vinod, 2017). The literature suggest that that financial inclusion gender gap could be the reason Africa has lagged behind the other continents in respect of growth and development (Triki & Faye, 2013). Universal access to finance to the formal financial sector has,

therefore, been suggested to have the ability to promote greater economic empowerment among women (Demirgüç-Kunt et al., 2013; Fanta & Mutsonziwa, 2016b; Ghosh & Vinod, 2017; Krishna, 2003; Krishnaswamy & Stuggins, 2003; Sakyi-Nyarko et al., 2022; Siddik, 2017b).

Women empowerment allows women the ability to freely make their own choices (Field, Pande, Rigol, Schaner, & Troyer Moore, 2021; Galab & Rao, 2003; Hashemi, Schuler, & Riley, 1996; Krishna, 2003; Krishnaswamy & Stuggins, 2003; Siddik, 2017b). It allows women to have control over their income, assets, and wealth (Adera & Abdisa, 2023; Arshad, 2023; Aziz et al., 2022; Field et al., 2021; Hashemi et al., 1996; Siddik, 2017b). Women empowerment is critical because its positive impact extends beyond the woman to other members of the society and communities such as to family members, church, and friends (Adera & Abdisa, 2023; Arshad, 2023; Krishna, 2003; Krishnaswamy & Stuggins, 2003; Muchomba, 2021).

As suggested, even though women access to finance is a key driver of women empowerment, there are still gender disparities that fuel significant gap in access to the finance for men and women (Adera & Abdisa, 2023; Demirgüç-Kunt et al., 2013). There is, therefore, the need to enhance women access to the formal financial sector to promote gender equality and women empowerment because empowerment can accelerate development, promote economic growth, and reduce the prevalence of poverty in Africa (Adera & Abdisa, 2023; Demirgüç-Kunt et al., 2013; Duflo, 2012a; Galab & Rao, 2003; Pitt, Khandker, & Cartwright, 2006; Siddik, 2017b). Empowering women is crucially important not just for the well-being of women but it benefits the growth and development of the society and the entire economy (Al-Dajani & Marlow, 2013; Sharma & Varma, 2008).

4.3 Review of theoretical and Empirical Literature

4.3.1 Theoretical Literature

The theoretical foundation of women empowerment varies because of the social context and international dimensions regarding the concept of power (Nawaz, 2015). Thus, women empowerment is influenced by many factors. This section discusses the theoretical and conceptual foundation of women empowerment.

4.3.1.1 Process (Action) versus Outcome (End or Goal)

For decades many scholars and development economist have argued whether empowerment is the process or the outcome (Nawaz, 2015). As a process, empowerment is seen as the basis or action through which the personal transformation of the individual who is being empowered happens (Gutierrez, 1995; Malhotra, Schuler, & Boender, 2002; Mandal, 2013; Nawaz, 2015). Empowerment is multidimensional and it is a transformative process that increases an individual's personal and interpersonal power to be able to progress their circumstances (Gutierrez, 1995; Malhotra et al., 2002; Nawaz, 2015). Thus, the empowerment process enables individuals to become self-aware, self-reliant, and to come to the epiphany that they can take their own decisions (make their own choices) and own their recourses to minimize or eliminate subordination (Malhotra et al., 2002; Mandal, 2013). Empowerment for women (women empowerment), therefore, enables women to realize their full identity and power in all spheres of life (such as educational, social, political, financial, and economic) (Sahay, 1998). On the other hand, the outcome perspective views being actually empowered as the outcome or end (Nawaz, 2015). However, using outcome (goal) alone to represent empowerment can be misleading (Garikipati, 2013; Nawaz, 2015) so both process (action) and outcome (goal) provide a good blend to conceptualise empowerment (Batliwala, 2007; Nawaz, 2015).

4.3.1.2 Bourdieu's Theory of Practice

This theory was advanced by a prominent sociologist called Pierre Bourdieu (Branson & Miller, 2020; Nawaz, 2015; Robbins, 2014). Bourdieu's theory hinges on the dynamics of power in society; that is situating power within the social context (Branson & Miller, 2020; Nawaz, 2015; Robbins, 2014). The theory highlights the means through which power is transferred and how social order is maintained from one generation to another generation (Branson & Miller, 2020; Nawaz, 2015; Robbins, 2014). The theory, therefore, helps to explain the role power plays in development and the social change process (Bourdieu, 2020; Nawaz, 2015). The theory suggests that power originates from the ability to mobilise capital (Nawaz, 2015). Power is created through the interaction of agency and structure, which are determined by individual or class habitus (Bourdieu, 2020; Nawaz, 2015).

The foundation of Bourdieu's theory is habitus, which refers to the social norms that guide behaviours and beliefs of the people and the community they live in (Bourdieu, 1984; Bourdieu, 2020; Nawaz, 2015). Habitus is not permanent but can change overtime (Bourdieu, 1984; Nawaz, 2015). It refers to the mental structures of individuals who belong to a particular class or group (say men and women) that can be transformed over time and then impact the structure of that class or group (Bourdieu, 1984; Nawaz, 2015). According to Bourdieu, this group or class can evolve overtime and can eventually change the structure of that group or class in the process (Nawaz, 2015). Bourdieu also uses the concept of doxa, which denotes the social constitution such as societal rules, norms and values (Bourdieu, 1984; Nawaz, 2015). Both habitus and doxa are closely related but doxa deals with the existing norms and values entrenched in a society whilst habitus looks at how the people and society see the rules and values in relation to doxa (Bourdieu, 1984; Nawaz, 2015).

Historically, African societies have had societal norms and rules, stereotypes, and assigned gender roles for many generations that have unfortunately encouraged male domination and women subordination (Bourdieu, 2020; Field et al., 2021; Galab & Rao, 2003; Hashemi et al., 1996; Krishna, 2003; Krishnaswamy & Stuggins, 2003; Nawaz, 2015; Siddik, 2017b). Until recently, women have been stereotyped as the weaker gender (to be seen but not heard) and restricted to the home whilst the men have been perceived as macho and allowed to take all the key decisions in the home and the society (Bourdieu, 2020; Field et al., 2021; Galab & Rao, 2003; Hashemi et al., 1996; Krishna, 2003; Krishnaswamy & Stuggins, 2003; Nawaz, 2015; Siddik, 2017b). This means things have changed, which lays credence to Bourdieu's theory. Bourdieu's theory is crucial to this study because it enables us to understand how access to finance have changed the social construct in respect of women empowerment and how that has impacted societal norms and rules.

4.3.1.3 The Resources, Agency and Achievement Theory of Women Empowerment

This theory suggests that women empowerment can be explored through the interrelatedness between resources (such as income), agency (action), and achievements (Bryan & Garner, 2022; Kabeer, 1999). It is the ability of women to own, have access, and control the needed resources (without discriminations) as well as to be able to take independent decisions and actions to achieve the desired results to improve their well-being as much as men are able to do (Bryan & Garner, 2022; Budgeon, 2015; Kabeer, 2012; Kurtiş, Adams, & Estrada-Villalta, 2016). Women empowerment is the process where women are able to exercise independent and personal life choices than they did before (Budgeon, 2015; Kabeer, 1999, 2005, 2012; Kurtiş et al., 2016). The literature suggest equal access to health and education, economic independence, income equality, equal financial access, amongst others tend to empower women. This theory firmly supports this study because women are not only expected to own resources must be must able to take action to achieve results

that empower women across the globe. Figure 4.1 shows the three dimensions of women empowerment in the resources, agency and achievement theory of women empowerment.

Figure 4. 1: Three Dimensions of Women’s Empowerment



Source: Adapted from Kabeer (1999) and Nawaz, (2015)

4.3.2 Empirical Literature: Effect of Financial Inclusion on Women Empowerment

Jayachandran (2015) and Adera & Abdisa (2023) found evidence to suggest that gender inequality, which is mostly against women, is globally pervasive. The literature, thus, suggest that empowering women and the girl-child remain a key indicator of social change and the aim of goal # 5 of Sustainable Development Goals (Adera & Abdisa, 2023). Goal # 5 is dedicated to achieving gender equality and empowering all women and girls across the world (Kaltenborn et al., 2020; Klapper et al., 2016). Also, differences in and challenges in education and financial literacy between men and women have been identified as being possible causes of gender gaps (Bageant & Barrett, 2017; Clarke, 2016; Hill, Robles, & Ceballos, 2016; Koomson et al., 2020c; Timu & Kramer, 2023). Recent studies have, however, suggested that finance is critical to inclusive growth so access to finance (financial inclusion) can help to fight against gender inequality and empower women (Adera & Abdisa, 2023; Jayachandran, 2015; Triki & Faye, 2013). This has occasioned and encouraged empirical studies on women empowerment (including dimensions of women empowerment) and access to finance. This section reviews recent empirical studies on women empowerment and the relationship between financial inclusion and women empowerment.

The literature suggest that access to finance is central to inclusive growth (Adedokun & Ağa, 2023; Demirgüç-Kunt et al., 2013; Ghosh & Vinod, 2017; Triki & Faye, 2013; Zins & Weill, 2016). This is because access to financial services (increased inclusive financial access) can improve individuals' wealth accumulation and well-being (reduce income inequality and the prevalence of poverty); particularly amongst women and the pro-poor members of the society (Brown et al., 2019; Célerier & Matray, 2019; Dabla-Norris & Srivisal, 2013; Demirgüç-Kunt et al., 2013; Liu et al., 2021; Nsiah & Tweneboah, 2023; Omar & Inaba, 2020a; Park & Mercado Jr, 2018; Ratnawati, 2020; Svotwa et al., 2023; Triki & Faye, 2013). Historically, women tend to be relatively less financially included compared to men (Cámara & Tuesta, 2014; Demirgüç-Kunt et al., 2013; Esmaeil Zaei et al., 2018; Timu & Kramer, 2023; Yaumidin et al., 2017; Zeier Röschmann, 2018). This means that women have less access to banking and insurance services compared to men (Adera & Abdisa, 2023; Chen et al., 2023; Timu & Kramer, 2023). The lack of access to finance amongst women has been identified as counter-purpose with the drive towards women empowerment (Adjei, 2015; Ashraf et al., 2010; Debnath, Rahman, Acharjee, Latif, & Wang, 2019; Pitt et al., 2006; Ruppanner, 2010). Women make up more than more half of the global population, which makes the issue of women empowerment very critical (Adjei, 2015; Ashraf et al., 2010; Ruppanner, 2010).

Holvoet (2005) found that access to affordable credit empowered women by improving the decision-making ability of women in Southern India. Investigating how granting micro credit to women and men impacted women's economic empowerment, Pitt et al. (2006) found that micro credit programmes positively impacted women's economic empowerment whilst credit to males negatively impacted women's empowerment in rural Bangladesh.

Investigating how access to finance from microfinance companies helped women empowerment in Indonesia, Yaumidin et al. (2017) found a positive relationship between access to finance and women empowerment because financially included women became more independent; such that they took charge over savings and credit. Their study, however, focused on access to finance from Islamic microfinance institutions, which made it rather narrow in scope and failed to capture the wider formal financial sector. The existing literature argue women empowerment is a multi-dimensional concept, hence, it is better measured as an index rather a single indicator. However, Yaumidin et al. (2017) did not use an index to represent women empowerment, hence, they missed the opportunity to assess the multi-dimensional nature of women empowerment in the study.

Using 114 participants from Punjab region of Northern India, the study by Zaei et al (2018) investigated if micro-credit (through self-help groups (SHGs)) empowered women. They found that, by joining SHGs, the women were able to access finance and generate own income, which empowered the women participants in that study. Debnath et al. (2019) found that access to microcredit led to greater legal awareness and greater ability to participate in household decision-making for women in Bangladesh. Their study, however, focused on two locations in rural Bangladesh (Jamalpur and Mymensingh), which make their results skewed and would be difficult to generalise for Africa. Their study also failed to take into consideration factors (such as women health & wellbeing, education, media & equal access, and governance & political participations) that recent studies have suggested are key indicators of women empowerment.

More recently, Field et al. (2021) attempted to investigate how greater autonomy and control of financial resources (finance and income) amongst women change the social construct (that is gender norms concerning the role of women in the society). Their study found evidence to suggest

that greater account ownership and financial literacy (through training on how to use accounts) amongst women as well as women receiving income directly into their own accounts (rather than into the accounts of their husbands) positively impacted women empowerment in rural India. Timu & Kramer (2023) found that increased access to agricultural insurance (crop insurance program) positively impacted gender-related outcomes in Kenya.

The review of the exiting literature shows that investigating the effect of financial inclusion on women empowerment in Africa is warranted because of a number of reasons:

First, even after controlling for individual characteristics such as income, education, employment status, rural residency and age, the literature suggest that gender inequality remains significantly associated to access and use of financial services (Demirgüç-Kunt et al., 2013), which calls for in-depth study to understand how to evenly improve financial inclusion between men and women.

Second, despite the increased attention for a paradigm shift towards inclusive growth and the use of finance to promote gender equity to improve women empowerment, there still remains a huge gender gap in respect of financial inclusion globally (Bageant & Barrett, 2017; Clarke, 2016; Hill et al., 2016; Timu & Kramer, 2023). This is of great concern because women form the majority of the world's population.

Third, the literature suggest that attempts to close the financial inclusion gender gap has been hindered by the absence of systematic indicators on the use of financial services (both formal and informal) globally (Demirgüç-Kunt et al., 2013), which requires an empirical investigation to close this literature gap.

Fourth, a number of studies have attempted to examine the relationship between financial inclusion and women empowerment but most of these studies have been focused on Asia so to close this gap, this study focuses on Africa and provides empirical results to address the issue of women empowerment through financial inclusion within the African context.

Fifth, the findings would contribute to the growing body of knowledge, especially empirical studies, on women's empowerment in developing countries.

Lastly, though previous studies have attempted study the relationship between inclusion and women empowerment, they have used a single indicator to represent financial inclusion. The literature suggest that this is a faulty approach because financial inclusion is a multidimensional concept so using an index is the more ideal approach. However, any financial inclusion index must be comprehensive and representative of the financial system; that is to say that it must not be constructed using only bank data like recent studies have done (Amidžic et al., 2014; Girón, Kazemikhasragh, Cicchiello, & Panetti, 2021; Park & Mercado Jr, 2018; Sarma, 2008, 2012; Zawaira, Clance, Chisadza, & Gupta, 2021). Thus, this study addresses this gap in literature by using a more comprehensive financial inclusion index (constructed using both bank and insurance information) to examine the relationship between financial inclusion and women empowerment in Africa.

4.4 Data and Methodology

Similar to recent studies, this study adopts a quantitative approach to answer the research questions and to achieve the study objectives (Adera & Abdisa, 2023; Koomson et al., 2020c; Nsiah & Tweneboah, 2023).

4.4.1 Data and Population of Study

4.4.1.1 Data

This study uses secondary data collected from various credible sources for the estimations and analysis. These sources include: World Development Indicators (WDI), which is credible source of data from the World Bank, provides a comprehensive dataset and has been used by recent empirical studies (Evans, 2016a; Gnangnon, 2021; Nsiah & Tweneboah, 2023). Financial Access Survey (FAS), which is a dataset for the International Money Fund (IMF), provides macroeconomic & financial data. FAS has also been used by recent studies (Espinosa-Vega et al., 2020; Inoue & Hamori, 2016). Other sources of data for this study include United Nations Development Programme (UNDP).

4.4.1.2 Population of Study

The study period is from 2000 to 2021. The choice of study was based on data availability on the selected Sub-Saharan African countries used in this study. Unlike previous, this study uses both bank and insurance data for the financial inclusion index. The capital market, which the third member of the financial system, was excluded due to lack of sufficient data. As a result of data availability, this study chose 14 African countries for this study. They are Botswana, Burkina Faso, Cameroon, Congo DR., Gambia, Kenya, Lesotho, Madagascar, Mozambique, Nigeria, Rwanda, Sierra Leone, Tanzania, and Uganda.

4.4.2 Methodology: Financial Inclusion and Women Empowerment in Africa

The study adopted and modified the empirical models used by recent studies (see Bushra & Wajiha (2015) and Zawaira et al., (2021)) to capture the effect of financial inclusion on women empowerment in Africa. Our model is specified below:

$$\ln WE_{it} = \alpha + \beta_1 \ln FII_{it} + \beta_2 \ln INF_{it} + \beta_3 \ln REM_{it} + \beta_4 \ln DCPS_{it} + \beta_5 \ln GOVEXP_{it} + \beta_6 \ln EDU_{it} + \beta_7 \ln GDPPC_{it} + \beta_8 \ln HDI_{it} + \beta_9 \ln POPGROWTH_{it} + \varepsilon_{it} \quad (4.1)$$

Where: WE, the dependent variable, represents the women empowerment proxied by gender inequality. This is regressed against set of independent variables including financial inclusion for Africa (represented by our constructed FII), which is the independent variable of interest in this study. The other independent variables include: inflation, remittances, private sector credit, government expenditure, education, GDP per capita, human development index, and population growth. Both the dependent and independent variables are discussed below.

4.4.3 Description, Measurement and Expected Results

This section presents the description variables used in this study, the explanations of their economic intuition and the expected impact on women empowerment in Africa.

Dependent Variable

- **Women Empowerment (WE)**

Women empowerment allows women the ability to freely make their own choices and to have control over their income, assets, and wealth (Adera & Abdisa, 2023; Arshad, 2023; Aziz et al., 2022; Field et al., 2021; Galab & Rao, 2003; Hashemi et al., 1996; Krishna, 2003; Krishnaswamy & Stuggins, 2003; Siddik, 2017b). Recent studies have suggested that finance in critical to inclusive growth so access to finance (financial inclusion) can help to fight gender inequality and empower women (Adera & Abdisa, 2023; Aziz et al., 2022; Jayachandran, 2015; Triki & Faye, 2013). This study posits that increase access to finance would improve women empowerment in Africa, hence, in line with recent studies, a positive relationship is expected between financial inclusion and women empowerment in Africa (Adera & Abdisa, 2023; Esmaeil Zaei et al., 2018; Field, Pande, Papp, & Rigol, 2013; Timu & Kramer, 2023).

Similar to recent studies, this study uses gender inequality index (GII) as a proxy for women empowerment in Africa (Braverman-Bronstein et al., 2023; MacArthur, Carrard, & Willetts, 2021). GII is a composite metric of gender inequality using three dimensions: reproductive health, empowerment and the labour market. GII falls with the range of 0 and 1. 0 represents fair gender equality between men and women across dimensions and 1 represents total gender inequality between men and women (Gaye, Klugman, Kovacevic, Twigg, & Zambrano, 2010).

The study adopts GII to represent women empowerment because of a number of reasons. First, previous studies have GII as a proxy for women empowerment (Charmes & Wieringa, 2003; Soharwardi & Ahmad, 2020). Second, GII is an index created from the main aims of SDG # 5, thus, cures the deficiencies in previous studies that used single indicators to represent women empowerment. The components of the GII are health (maternal mortality ratio and adolescent birth rate), education (secondary school attainment - female and male population with at least secondary education), politics (women's parliamentary seat or female shares of parliamentary seats), and economics (female and male labour force participation rates) (Soharwardi & Ahmad, 2020). These components are aligned with the core tenants of SDG # 5. Third, gender index that allows comparisons across a wide sample of countries and focuses on the measurement of achievements key drivers of SDG # 5 and women empowerment such as health, economic, educational, and political empowerment (Medina & Herrarte, 2020).

Explanatory Variables

- **Financial Inclusion (FII)**

FII, which is the study's independent variable of interest, is represented by the financial inclusion index constructed in chapter 2 of this study. The literature suggest that women's access to finance

(increased inclusive financial access to women) would help them in wealth accumulation and improve their well-being (that is reduce income inequality and the prevalence of poverty), which will ultimately empower women (Adera & Abdisa, 2023; Arshad, 2023; Aziz et al., 2022; Field et al., 2021; Hashemi et al., 1996; Krishna, 2003; Siddik, 2017b). In line with recent studies, therefore, this study expected a positive relationship between financial inclusion and women empowerment in Africa.

- **Inflation (INF)**

Inflation is the persistent rise in the price of goods and services over time. Rising inflation tend to causes rise general price level, which reduces the amount of goods and services individuals/households can buy or afford (Ndoricimpa, 2017). The literature suggest that higher inflation rate can be detrimental to women empowerment because it reduces disposable income of individuals and households and promote inequality (that is significantly skewed against women than men) whilst lower inflation rates can promote gender equality (that is beneficial to women empowerment) (Jaravel, 2021; Omar & Inaba, 2020a; Park & Mercado Jr, 2018; Siami-Namini & Hudson, 2019; Tsouli, 2022). This study hypothesises that inflation would worse gender inequality and hinder women empowerment in Africa.

- **Remittance (REM)**

Remittances (personal inward remittance) measure inflow of personal remittances from migrant workers resident outside the country to beneficiaries (particularly to relatives) in the country. Receipt of personal remittances increases disposable income of household beneficiaries, which helps them to increase their consumption, save more, invest in themselves (Adera & Abdisa, 2023; Van Biljon, Von Fintel, & Pasha, 2018). Inward remittance also allows women to invest into productive (economic) and entrepreneurial ventures, which helps them to generate further income

and get empowered (Adera & Abdisa, 2023; Van Biljon et al., 2018). Accordingly, this study posits that inward personal remittance would increase the disposal income of women and ultimately empower women in Africa.

- **Domestic Credit to Private Sector (DCP)**

Financial resources and financial development reduces inequalities within an economy (Agyekum, 2017; Levine, 2021). Similar to recent studies, private sector credit to GDP is used to measure financial development in this study (Levine, 2021; Omar & Inaba, 2020a). The study expects that financial development would reduce the gender inequality gap and empower women in Africa.

- **Government Expenditure (GOX)**

The existing literature provide mixed results on the impact of government expenditure/spending on income inequality (Sidek, 2021). This study, however, acknowledges the importance of government spending to income inequality because of a number of reasons. First, government spending (provision of public goods) boosts the productivity of the private sector inputs, which increases total output (Grossman, 1988). Second, the Keynesian economists argue that government spending is beneficial to the economy (Nsiah & Tweneboah, 2023). Third, the redistribution of income and wealth within a population in an economy can occur not only through taxation but also through government expenditure/spending, hence, government expenditure can be viewed as a tool for resource redistribution to reduce the income inequality gap (Sidek, 2021). This study uses general government final consumption expenditure, which includes all government current expenditures for purchases of goods and services (including compensation of employees) as a percentage of the gross domestic product, as proxy for government spending (Kavya & Shijin, 2020). The study postulates that government expenditure/spending (as a tool for redistribution of resources to benefit economic agents) would help to close the gender inequality gap in Africa.

- **Education (EDU)**

The literature suggest that education is an agent of change and an income equalizer (Shukla & Mishra, 2020). Education is a critical tool for attaining gender equality and poverty reduction (Bhattacharya & Banerjee, 2012; Engida, 2021). The existing literature suggest increasing women access to education (especially quality education) and improving the literacy rate (including financial literacy) amongst women are key to increasing the capacity of women and closing the inequality gap (Barman, 2018; Bhattacharya & Banerjee, 2012; Bushra & Wajiha, 2015; Chowdhury, Rahman, & Haque, 2023; Engida, 2021; Singh, 2013). Thus, higher and quality education would help women to challenge discriminatory norms and practices against them (Malik & Courtney, 2011). In line with recent studies, this study expects education to exhibit a positive relationship with women empowerment in Africa.

- **Economic Growth (GDP)**

Per capita GDP, which is a widely used indicator for economic growth, is adopted as proxy for economic growth in Africa in this study (Hajilee, Stringer, & Metghalchi, 2017; Inoue & Hamori, 2016; Kim, 2016; Omar & Inaba, 2020b; Rahman et al., 2020; Van et al., 2021). GDP per capita is measured as gross domestic product divided by mid-year population. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. Recent studies have suggested that economic growth is important to gender equality and women empowerment because improvements in economic growth promote improvement in overall human development for households and individuals; including women (Agyemang-Badu et al., 2018; Kabeer & Natali, 2013; Kuznets, 2019; Nsiah & Tweneboah, 2023; Yang & Greaney, 2017). Thus, improvements in economic growth is expected to be beneficial to and positively impact all economic agents in an economy;

including women (Agyemang-Badu et al., 2018; Kuznets, 2019; Nsiah & Tweneboah, 2023; Yang & Greaney, 2017). Similar to recent studies, therefore, this study expects a positive relationship between economic growth and women empowerment (reduce gender inequality) in Africa (Saqib, 2016).

- **Human Development Index (HDI)**

Human development is a multidimensional concept that is related to the well-being and capabilities of individuals and households (Alkire, 2002; Khan et al., 2019; Tripathi, 2019). Human development ensures improvements and enlarging peoples' economic (including financial and employment), social (including culture), spiritual political, legal, educational, and health (including mortality) choices (Alkire, 2002; Dilli, Carmichael, & Rijpma, 2019; Engo, 2018; Gaye et al., 2010; Kabeer & Natali, 2013; Khan et al., 2019; Tripathi, 2019). The Human Development Index (HDI), which measures long and healthy life, being knowledgeable and having a decent standard of living (Klugman, Rodríguez, & Choi, 2011), is used this study as the proxy variable for human development. HDI captures both monetary and non-monetary indicators of an individual and household capability and overall well-being (Abdelghaffar et al., 2023; Alkire, 2002; Engo, 2018). The HDI is a composite index made of three (3) dimensions, which are long and healthy life (health), knowledge (education), and decent standard of living. First, the health dimension is measured by life expectancy at birth. Second, the education dimension is measured by mean years of schooling for adults aged 25 years or more and expected years of schooling for children of school entering age. Last, standard of living dimension is measured as gross national income per capita. The HDI is expressed as a value between a scale range of 0 and 1; with 0 being no (low) development and 1 being absolute (high) development. Like the literature suggest, human development helps to enlarge peoples' choices so this study expects a positive relationship between HDI and women empowerment in Africa.

- **Population Growth (POP)**

Unlike rich and urban dweller, women, the poor households and rural dwellers are prone to experience wide income inequality (Butler et al., 2020; Kentor, 2001; Mdingi & Ho, 2021). So examining the impact of population growth on women empowerment in Africa is particularly important because of a number of reasons. First, women form the majority of Africa's population. Second, Africa is the poorest continent in the world; with majority of Africans living in extreme poverty or below the poverty level. Third, majority of Africans live in rural area (Butler et al., 2020). Fourth, there are wider income inequality gaps in Africa compared to the rest of the world (Mdingi & Ho, 2021). Recent studies suggest that population growth is positively associated with inequality (Parrado & Kandel, 2010) so this study expects population growth would cause widening of gender equality in Africa. For this study, annual population growth rate (POP) for year t is the exponential rate of growth of mid-year population from year $t-1$ to t , expressed as a percentage. Population is based on the de facto definition of population, which counts all residents regardless of legal status or citizenship.

4.4.4 Estimation Method

This study employed a panel regression analysis, which involves both panel unit root test and panel cointegration test.

4.4.4.1 Panel Unit Root Test

The literature has demonstrated that integrated panel data regression though the estimator is consistent, the t -statistic diverges so that inferences about the regression coefficient are wrong with the probability that goes to one asymptotically (Kao, 1999; Kao & Chiang, 2001; Pesaran, 2007, 2012). Thus, this study carried out panel unit root tests on the dependent and independent variables to avoid spurious regression. The study followed the approach of recent studies that also adopted

a panel unit root test for the joint null hypothesis that every time series in the panel is non-stationary (Im, Pesaran, & Shin, 2023; Pesaran, 2012). This allows for heterogeneity in the value of ρ_i under the alternative hypothesis.

4.4.1.2 Panel Cointegration Test

The panel sample has 14 countries and a 22-year time span, and so has more years than cross-sample units, the variables might not be stationary but I (1) and the model is probably dynamic. In this framework the use of a panel-ARDL model is more appropriate (Pesaran, 1997; Pesaran & Smith, 1995). The panel ARDL test model is appropriate for this study and it is preferred to the other estimation techniques due a number of reasons. First, it is suitable for testing the short and long-run con-integration among the variables; that is its ability to test both short and long-run effects among variables simultaneously. Second, it is appropriate for studies in which the variables exhibit mixed order of integration; that is they are I (0) or I (1) or both. Third, it works with studies (like this one) that have small data sample (Muhammad and Abdullahi, 2020). Fourth, this estimation technique helps to handle serial correlation and endogeneity problems among variables. Last, according to the literature the advantages over other dynamic panel methods (such as the fixed effects, instrumental variables or the GMM estimators) is that these methods can produce inconsistent estimates of the average value of the parameters unless the coefficients are identical across countries (Anderson & Hsiao, 1981, 1982; Arellano & Bover, 1995). The model estimated has the form of an ARDL (p, q, q,.... q) model (Equation 4.2):

$$\pi_{it} = \sum_{j=1}^p \alpha_{ij} \pi_{ij-1} + \sum_{j=0}^q \delta_{ij} X_{it-j} + \mu_i + \varepsilon_{it} \quad (4.2)$$

Where X is the vector of explanatory variables. Reparametrising the model, it turns into:

$$\Delta \pi_{it} = \varphi_i (\pi_{ij-1} - \beta_i X_{it}) + \sum_{j=1}^{p-1} \alpha_{ij} \Delta \pi_{ij-1} + \sum_{j=0}^q \delta_{ij} \nabla X_{it-j} + \mu_i + \varepsilon_{it} \quad (4.3)$$

Where the β_i are our vector of interest, which measures the long-run impact of the explanatory variables on the share of renewables and φ_i is the error corrector mechanism impact. The remaining parameters are the short run coefficients. The disturbances ε_{it} are independently distributed across time and units, with zero mean and variance constant within each unit. The model of Equation 4.3 allows for the parameters to vary between units. This can be consistently estimated using the Mean Group (MG) estimator, which estimates the parameters for each country and then average for the group. However, they also showed that if the long-run coefficients are homogeneous across groups we can use a more efficient estimator, the Pooled Mean Group (PMG) which allows the short run parameters to vary from country to country but forces the long run ones to be homogenous. Finally, to apply these methods the variables have to be a mixture of I (1) and I (0) and for the model to be read as an error correction mechanism, the variables have to be cointegrated.

4.5 Empirical Results: Effect of Financial Inclusion on Women Empowerment in Africa

4.5.1 Panel Unit Root Tests

There is the need to determine order of integration of the variables in the study. Each of the variables must be stationary to avoid spurious regression. For an efficient and consistent coefficient estimate each of the series under consideration should be integrated of order zero. There are many kinds of test statistics available for panel data unit root testing, under different assumptions concerning the distribution of the data. Im, Pesaran, and Shin panel unit root tests are used in this study to examine the stationarity of the variables. Table 4.1 displays the findings from the panel data unit root testing.

Table 4. 1: Panel Unit Root Test

Variable	Level		First difference	
	Intercept	Intercept and Trend	Intercept	Intercept and Trend
LNGII	-2.0770***	0.0429	-7.5594***	-9.5054***
FII	1.5741	0.2382	-12.8151***	-10.2925***
LNEDU	0.7871	1.2613	-11.8669***	-10.8735***
LNGDPPC	-2.5147***	3.0850	-10.3197***	-11.5225***
LNGOVEXP	-3.1292***	-2.6086***	-	-
LNHDI	-9.0998***	5.7947	-2.9538***	-4.7155***
INFL	-8.0893***	-7.1703***	-	-
LNPS	0.3375	-2.3052***	-11.1114***	-12.1382***
LNREM	-2.6614***	-0.7402	-12.2424***	-10.3560***
POPGROWTH	-0.1471	-1.5322*	-6.2771***	-5.9529***

Source: author's own computation, 2024.

The results from the Table 4.1 indicate that gender inequality index, financial inclusion index, education, and GDP per capita are non-stationary at the level. The results of the first difference panel unit root test indicate otherwise. That is the aforementioned variables are stationary at the first differences. This gives the indication that gender inequality index, financial inclusion index, education and GDP per capita are integrated of order one (I (1)). In other words, they are I (1) series. Government expenditure is stationary at the level, which indicates that government expenditure has zero-order (I (0)) integration. Human capital index is non-stationary at the level. The results of the first difference panel unit root test indicate that human capital index is stationary

at the first difference. That is human capital index is I (1) series. Inflation is stationary at the level, which also indicates that inflation has zero-order (I (0)) integration. The short-run and long-run relationships were, therefore, estimated using the panel ARDL estimation technique.

4.5.2 Panel Cointegration Regression Results for Women Empowerment Model

This section discusses the regression results of financial inclusion, women empowerment, and other explanatory variables based on the panel cointegration results for women empowerment model. The results are presented in Table 4.2 and discussed below:

Table 4. 2: Panel Cointegration Estimates of the Model

Variable				
LR		Coefficient	Standard error	t-Statistic
	FII	0.5657***	0.0494	11.45
	LNEDU	-0.0565***	0.0192	-2.94
	LNGDPPC	-0.1197***	0.0241	-4.95
	LNGOVEXP	-0.3094***	0.0231	-13.38
	LNHDI	-0.5589***	0.0639	-8.75
	INFL	-0.0007***	0.0003	-2.71
	LNPSK	-0.0147***	0.0016	-9.41
	LNREM	-0.0242***	0.0041	-5.90
	POPGROWTH	-0.0053**	0.0026	-2.07
ECT		-0.0965*	0.0538	-1.79
SR				
	Δ FII	-0.0874*	0.0490	-1.78
	Δ LNEDU	0.0311*	0.0178	1.74

$\Delta \text{LNGDPPC}$	-0.0404	0.0722	-0.56
$\Delta \text{LNGOVEXP}$	0.0162*	0.0086	1.87
ΔLNHDI	-0.0978	0.2287	0.43
ΔLNINF	-0.0001	0.0003	-0.20
ΔLNPSC	0.0217	0.0157	1.38
ΔLNREM	0.0002	0.0041	0.04
$\Delta \text{POPGROWTH}$	0.0479***	0.0169	2.84
CONSTANT	0.0594**	0.0251	2.37

Source: Author's Computation, 2024.

The error correction term (ECM (-1)) displays the endogenous responses to shocks of the dependent variables by depicting the rate of adjustment. The ECM coefficient in Table 4.2 is negative, demonstrating the co-integration and stability among the model's variables. As a result, the model has a 10 percent level of significance for stability, and equilibrium in the long run will change following any short-term shock by about 10 percent annually. The ECM coefficient demonstrates that after short-term shocks, the long-run equilibrium is reached for gender inequality, financial inclusion, education, GDP per capita, government expenditure, human capital index, inflation, private sector credit to GDP ratio, remittances, and population growth.

The results show that financial inclusion has significant effect on women empowerment at 10 percent level of significance in the short run in Sub-Saharan Africa. The negative coefficient indicates that as financial inclusion increases gender inequality reduces (women empowerment improves) in the short run in Sub-Saharan Africa. The magnitude of the coefficient shows that a unit increase in financial inclusion index reduces gender inequality index by 0.09%. This means

that improvement in financial inclusion enhances women empowerment in the short run in Sub-Saharan Africa.

The literature suggest that financial inclusion can contribute to women's economic empowerment through at least three theoretical mechanisms. First, women included in the financial system are likely to save more and increase their productive investments and private expenditures (Dupas & Robinson, 2013). One of the key findings from their study was that women included in the financial system were more likely to save money (Dupas & Robinson, 2013). Such savings do not only provide a safety net for women during emergencies but also enables them to accumulate capital for productive and investment purposes such as starting or expanding a business. This, in turn, empowers women to have greater control over their financial resources and improve their well- and that of their families (Adera & Abdisa, 2023; Ashraf et al., 2010). Financial autonomy also enhances women's bargaining power and influence in decision-making processes (Adera & Abdisa, 2023; Beneria & Sen, 1982; Kabeer, 1999, 2005).

Second, financial inclusion provides women with the opportunity to establish a financial identity by accessing formal financial services and building a credit history (World Bank, 2018). This enables them to demonstrate their creditworthiness and access loans and credit facilities (Cole, Sampson, & Zia, 2011; Demircuc-Kunt et al., 2018; Field et al., 2013). Access to credit allows women to invest in their businesses, expand economic activities, and generate income (Kabeer, 1999). Access to credit also improves financial literacy amongst women and strengthens their economic independence. (Cole et al., 2011; Demircuc-Kunt et al., 2018; Field et al., 2013). Financial literacy empowers women to use credit strategically, invest wisely, and repay loans punctually, which further enhances their creditworthiness and builds trust with financial

institutions (Field et al., 2013; Joshi, Desai, & Dawood, 2016; Kumari, Ferdous, & Klalidah, 2020). Also, the ability to access credit empowers women to make autonomous financial decisions, exert control over their economic activities, and challenge traditional gender norms that restrict the women economic participation (Adera & Abdisa, 2023; Nawaz, 2015).

Third, financial inclusion plays a pivotal role in promoting labor force participation among women (Adera & Abdisa, 2023; Ibourk & Elouaourti, 2023). By providing access to credit, savings, and other financial services, financial inclusion empowers women to invest in their businesses, expand economic activities, and become actively engaged in the workforce (Kabeer, 1999). Therefore, financial inclusion serves as a catalyst for labor force participation, which in turn increases women's economic empowerment (Adera & Abdisa, 2023; Ibourk & Elouaourti, 2023).

Among the control variables, the results show that education exerts significant effect on gender inequality at the 10 percent level of significance in the short run in Sub-Saharan Africa. The positive coefficient indicates that as level of education increases gender inequality increases as well in the short run in Sub-Saharan Africa. The magnitude of the coefficient shows that a percentage increase in the level of education increases gender inequality index by 0.03%. This means that improvement in the level of education reduces the level of women empowerment in the short run in Sub-Saharan Africa. This may be due to the structure (such as traditional and conservative way of live) and the pervasiveness of the culture of a male-dominated higher educational organisations in typical African societies that tend to fuel gender inequality (Quadlin, VanHeuvelen, & Ahearn, 2023; Rosa & Clavero, 2022). Though result is a surprising one as it is expected that level of education will improve women empowerment, it is in line with recent studies that found the education did not close the wage inequality gap (Quadlin et al., 2023).

GDP per capita exerts insignificant effect on gender inequality even at the 10 percent level of significance in the short run in Sub-Saharan Africa. This means that GDP per capita does not contribute to women empowerment in the short run in Sub-Saharan Africa. This means that it takes sometimes for increases in GDP per capita to fuel women empowerment. This may be because due a number of reasons. First, development programmes tend not to be women inclusive. That is to say these development conversation do not acknowledge or factor the importance of women in the economic development process. Second, traditionally, within the African societies, more investments are made into women's reproductive rather than in their productive roles (Duflo, 2012b). This results is in line with recent studies (Duflo, 2012b).

Government expenditure has positive significant effect on gender inequality at the 10 percent level of significance in the short run in Sub-Saharan Africa. The positive coefficient indicates that as government expenditure increases gender inequality increases during the study period. The magnitude of the coefficient shows that a percentage increase in government expenditure increases gender inequality index by 0.02%. This means that increases in government expenditure reduces the level of women empowerment in the short run in Sub-Saharan Africa. This means that short-run expansionary fiscal policy is not tailored towards improving the capability of women to function well in the society.

Population growth has significant effect on gender inequality at the 1 percent level of significance in the short run in Sub-Saharan Africa. The positive coefficient indicates that as population growth increases gender inequality increases in the short run in Sub-Saharan Africa. The magnitude of the coefficient shows that a percentage point increase in population growth increases gender inequality

index by 0.05%. This means that increase in population growth worsens the state of women empowerment in the short run in Sub-Saharan Africa.

Human development index, inflation, private sector credit to GDP ratio, and remittances have insignificant effects on gender inequality even at the 10 percent level of significance in the short run in Sub-Saharan Africa. This means that human development, inflation, private sector credit to GDP ratio and remittances do not contribute to women empowerment in the short run in Sub-Saharan Africa.

With reference to the long-run analysis, the results show that financial inclusion has significant effect on gender inequality at the 1 percent level of significance in the long run in Sub-Saharan Africa. The positive coefficient indicates that as financial inclusion increases gender inequality increases as well in the long run in Sub-Saharan Africa. The magnitude of the coefficient shows that a unit increase in financial inclusion index increases gender inequality index by 0.56 percent. This means that improvement in financial inclusion worsens the state of women empowerment in the long run in Sub-Saharan Africa. This suggests that even financial inclusion is beneficial to women empowerment in the short-run, it is not beneficial in the long-run, which could suggest a time-threshold-effect. It could suggest that financial inclusion is important and contribute to women empowerment, but there are other factors that play more fundamental role and contribute to women empowerment; particularly in the long term. This results make significant addition to knowledge because a review of the existing literature did not provide evidence of a study that has attempted to investigate the long-run impact of financial inclusion on women empowerment; particularly in Africa.

Among the control variables, the results show that education exerts significant effect on gender inequality at the 1 percent level of significance in the long run in Sub-Saharan Africa. The negative coefficient indicates that as level of education increases gender inequality reduces in the long run in Sub-Saharan Africa. The magnitude of the coefficient shows that a percentage increase in the level of education reduces gender inequality index by 0.31 percent. This means that improvement in the level of education improves the level of women empowerment in the long run in Sub-Saharan Africa. This may due to a number of reasons. First, access to education (knowledge) and improvements in literacy increase the capacity of women and closes inequality gap, which lead to women empowerment (Nikkhah, Redzuan, & Abu-Samah, 2010). Second, education exposes women to their rights, which enables them to challenge discriminatory norms and practices against them (Malik & Courtney, 2011). Third, education enables women to take own decision, which empowers them (Banerjee, Alok, & George, 2020; Sell & Minot, 2018). This results is consistent with recent studies that found evidence to suggest a positive relationship between education and women empowerment (Abbas, Isaac, Zia, Zakar, & Fischer, 2021; Akram, 2018; Chaudhry & Nosheen, 2009; Nikkhah et al., 2010; Obayelu & Chime, 2020).

The results further show that GDP per capita exerts significant effect on gender inequality at the 1 percent level of significance in the long run in Sub-Saharan Africa. The magnitude of the coefficient shows that a percentage increase in GDP per capita reduces gender inequality index by 0.12 percent. This means that improvement in the level of GDP per capita improves the level of women empowerment in the long run in Sub-Saharan Africa. There are several channels through which economic growth can promote women's empowerment. First, economic growth can stimulate labour demand, which can draw women into the labour force. Second, economic growth can promote or accelerate structural change, with implications for female empowerment. Third,

economic growth can generate higher tax revenues that can be used to increase health and education spending, thereby lowering gender gaps in these areas. Fourth, improvements in economic growth is expected to be beneficial to and positively impact all economic agents in an economy; including women (Agyemang-Badu et al., 2018; Kuznets, 2019; Yang & Greaney, 2017). In line with recent studies, this study found evidence to suggest that economic growth empowered women in Africa during the study period (Agyemang-Badu et al., 2018; Kuznets, 2019; Yang & Greaney, 2017).

Government expenditure has significant effect on gender inequality at the 1 percent level of significance in the long run in Sub-Saharan Africa. The negative coefficient indicates that as government expenditure increases gender inequality decreases in the long run in sampled Sub-Saharan African countries. The magnitude of the coefficient shows that a percentage increase in government expenditure reduces gender inequality index by 0.31 percent. This means that increases in government expenditure improves the level of women empowerment in the long run in Sub-Saharan Africa. Fiscal policy can provide resources to promote female economic empowerment by providing public employment opportunities for women in health or education sectors (such as providing better, safe, and reliable transportation services or publicly funded childcare). The results, therefore, suggest that women must also claim government resources and spending (including programmes and policies) just like the men to increase women empowerment in Africa. The results also support the suggestion that gender neutral budget does not empower women (Singh, 2013). The findings is consistent with recent studies that suggest government spending positively impact women empowerment (Britt & Egerer, 2024; Desai, 2010; Singh, 2013). Desai (2010) and Singh (2013) suggested that government gender budgeting promote

women empowerment in India whilst Britt & Egerer, (2024) suggest that targeted public spending on women can lead to women empowerment.

Human development index has significant effect on gender inequality at the 1 percent level of significance in the long run. The negative coefficient indicates that as human capital increases gender inequality decreases in the long run in the sampled Sub-Saharan Africa countries. The magnitude of the coefficient shows that a percentage increase in human capital index reduces gender inequality index by 0.56 percent. This means that improvement in human development also improves the level of women empowerment in the long run in Sub-Saharan Africa. Again, inflation has significant effect on gender inequality at the 1 percent level of significance in the long run in Sub-Saharan Africa. The negative coefficient indicates that as inflation increases gender inequality decreases in the long run in Sub-Saharan Africa. The magnitude of the coefficient shows that a percentage increase in inflation reduces gender inequality index by 0.001 percent. This means that increases in the rate of inflation improves the level of women empowerment in the long run.

Moreover, private sector credit to GDP ratio has significant effect on gender inequality at the 1 percent level of significance in the long run in Sub-Saharan Africa. The negative coefficient indicates that as private sector credit to GDP ratio increases gender inequality decreases in the long run. The magnitude of the coefficient shows that a percentage increase in government expenditure reduces gender inequality index by 0.01 percent. This means that increases in private sector credit to GDP ratio improves the level of women empowerment in the long run in Sub-Saharan Africa. Remittances exert significant effect on gender inequality at the 1 percent level of significance in the long run in Sub-Saharan Africa. The negative coefficient indicates that as remittances increase gender inequality decreases in the long run in Sub-Saharan Africa. The magnitude of the

coefficient shows that a percentage increase in remittances reduces gender inequality index by 0.02 percent. This means that increases in remittances improve the level of women empowerment in the long run in Sub-Saharan Africa. The study results is in line with recent studies that highlight the importance of inward remittance on economic agents; such that inward remittance to women helps them to invest into productive (economic) and entrepreneurial ventures, which can help them to generate further income and get empowered (Kumar, Ali, & Kibria, 2021; Nahar, Hasan, Hasan, & Alom, 2022).

Finally, population growth has significant effect on gender inequality (women empowerment) at the 5 percent level of significance in the long run in Sub-Saharan Africa. The negative coefficient indicates that as population growth increases gender inequality decreases in the long run in Sub-Saharan Africa. The magnitude of the coefficient shows that a percentage point increase in population growth reduces gender inequality index by 0.01 percent. This means that increase in population growth improves the state of women empowerment in the long run in Africa.

4.6 Summary, Conclusions, and Recommendations

4.6.1 Introduction

This chapter summarizes and concludes the findings of the study. Appropriate policy recommendations are distilled out of the empirical results for implementation.

4.6.2 Summary of the Findings

The study examined the effect of financial inclusion on women empowerment in Africa. Women empowerment (proxied by gender inequality index) was the dependent variable whilst financial inclusion (that is the financial inclusion index constructed in Chapter 2 of this study) was the independent variable of interest. The study included other independents in the regression

estimations. To achieve our objectives, the study employed panel ARDL to estimate the long-run and short-run relationships between financial inclusion and women empowerment in the sampled Sub-Saharan Africa countries during the study period. Summary of the findings are below.

The study found that financial inclusion improves women empowerment in short run and decreases the level of women empowerment in the long run in Sub-Saharan Africa. Financial inclusion can contribute to women's economic empowerment through at least three theoretical mechanisms.

First, women included in the financial system are likely to save more and increase their productive investments and private expenditures. In addition to productive investments, financial inclusion also had a positive impact on women's private expenditures. By having access to formal financial services, women could manage their finances more effectively and make informed decisions regarding household expenses. The ability to access credit empowers women to make autonomous financial decisions, exert control over their economic activities, and challenge traditional gender norms that restrict their economic participation (Adera & Abdisa, 2023; Nawaz, 2015). This, in turn, empowers women to have greater control over their financial resources and improve the well-being of themselves and their families.

Second, financial inclusion provides women with the opportunity to establish a financial identity by accessing formal financial services and building a credit history. This enables them to demonstrate their creditworthiness and access loans and credit facilities. By having access to credit, women can invest in their businesses, expand economic activities, and generate income. This increased access to credit not only enhances women's financial resources but also strengthens their entrepreneurial capabilities and economic independence. Furthermore, financial inclusion fosters women's financial literacy and capacity to manage credit effectively. Through financial

literacy programs (tailored financial education), women gain the knowledge and skills necessary to understand credit terms, make informed borrowing decisions, and manage their finances responsibly.

Third, financial inclusion plays a pivotal role in promoting labour-force participation among women. By providing access to credit, savings, and other financial services, financial inclusion empowers women to invest in their businesses, expand economic activities, and generate income.

In the long-run, the study found that the other independent variables; that is education, GDP per capita, government expenditure, human capital index, inflation, private sector credit to GDP ratio, remittances, and population growth, all influenced women empowerment in Africa during the study period.

4.6.3 Conclusion

The study examined the effect of financial inclusion on women empowerment in Africa. The study found that financial inclusion improves women empowerment in short run, which a positive perspective women in Africa but decreases the level of women empowerment in the long run. Thus, the results suggest that there could a time-threshold effect between financial inclusion and women empowerment, which motivates further studies on that. This results is significant addition to knowledge because a review of the existing literature did not provide evidence of a study that has attempted to investigate the long-run impact of financial inclusion on women empowerment; particularly in Africa.

The study also found that that is education, GDP per capita, government expenditure, human capital index, inflation, private sector credit to GDP ratio, remittances, and population growth, all influenced women empowerment in Africa in the long-run during the study period.

4.6.4 Recommendations and Policy Implications

The study results show that financial inclusion improves women empowerment in short run, which is a positive for women in Africa, but decreases the level of women empowerment in the long run. The study suggests the financial inclusion is only beneficial to women empowerment in Africa only in the short-run. The implication of this is that solely using financial inclusion to improve women empowerment in Africa may not be sustainable in the long-run. The analysis, therefore, raises several useful policy ideas; especially to enhance the short-run benefits of financial inclusion.

First, women-owned financial services offer women greater control over their money, so regulators and the providers of financial services must provide clear and well-defined products and services (including terms and conditions) dedicated to women to promote women financial inclusion.

Second, the literature suggests that digital financial inclusion (digital financial finance) is reaching the unbanked and underserved faster than traditional financial inclusion (such as branch and channel network expansion), which means that groups that are likely to be financially excluded (such as women, the poor and youth) can be financially included faster through digital financial inclusion (Agyekum et al., 2016; Ayadi & Shaban, 2020). Also, during the COVID-19 pandemic, digital financial inclusion (such as mobile money services) was a key means through which economic agents (particularly women who were mainly at home taking care of their families) access financial services (Ayadi & Shaban, 2020; Li, Wu, & Xiao, 2020; Machasio, 2020; Shaikh, Glavee-Geo, Karjaluoto, & Hinson, 2023). This is because it is cheaper and easier to access

(anywhere and anytime) by segments of the population (Ayadi & Shaban, 2020; Museba, Ranganai, & Gianfrate, 2021). Therefore, regulators and the providers of financial services must adopt (design) and enhance the provision of digital financial services and/or partner the telecommunication and FinTech companies in the provision of digital financial services such as the money mobile and insure-tech products. The COVID-19 pandemic was challenging but it provided the opportunities and platform for digital financial inclusion to thrive.

Third, governments should enact laws and adequate consumer protection legislations that promote equity (open market for all players) in order to eliminate any barriers women face whilst accessing the financial sector.

This study recommends the following studies for future. First, future studies can attempt to investigate the exact period (time-threshold effect) at which the positive impact of financial inclusion on women empowerment reaches the tipping point; that is the point that financial inclusion becomes no longer beneficial to women empowerment. Other studies can also attempt to examine any threshold effect of financial inclusion and women empowerment to understand which level of financial inclusion is not beneficial to women empowerment. Last, future studies can broaden the scope of the study to include all countries in Africa.

CHAPTER 5

SUMMARY, CONCLUSIONS, AND POLICY RECOMMENDATIONS

5.1 Introduction

This chapter summarises all the previous chapters of this thesis. It divided into the following sections: summary and major findings of the thesis, research contributions and policy recommendations, and study limitations and recommendations for future studies

5.2 Study Summary

This thesis empirically investigated financial inclusion and women empowerment in Africa. First, the study developed a financial inclusion index and examined the determinants of financial inclusion using 14 sampled sub-Saharan African countries (namely Botswana, Burkina Faso, Cameroon, Congo DR., Gambia, Kenya, Lesotho, Madagascar, Mozambique, Nigeria, Rwanda, Sierra Leone, Tanzania, and Uganda.). Second, the study examined the threshold effect of financial inclusion on economic growth and income inequality in Africa. Finally, the study examined the effect of financial inclusion on women empowerment in Africa.

Chapter 1 focuses on introduction and background of the study.

First, the literature suggest that financial inclusion is a multidimensional concept (Cámara & Tuesta, 2014; Omar & Inaba, 2020a; Sarma, 2008, 2012; Triki & Faye, 2013). Some previous studies used single indicators to represent financial inclusion, which failed to capture the multidimensional nature of financial inclusion. Others studies used an index (constructed using only bank) to represent financial inclusion. Though their indexes captured the multidimensional nature of financial inclusion but they did not cover majority of the financial sector, which means that those studies failed to capture the other significant players of the financial sector such as

insurance in their respective financial inclusion indexes. This study, thus, fills this literature gap by creating a financial inclusion index using both banking and insurance data.

Second, the literature suggest the need for a paradigm shift towards inclusive growth and sustainable development (Ali & Son, 2007; Triki & Faye, 2013). This is important because inclusive growth creates shared economic growth and prosperity for all economic agents and helps to reduce the prevalence of poverty and income inequality amongst all segments of the population (Ali & Son, 2007; Nsiah et al., 2021; Triki & Faye, 2013). Access to finance has been identified as critical to achieving inclusive growth and sustainable development (Ofosu-Mensah Ababio et al., 2021; Triki & Faye, 2013; Zins & Weill, 2016). Previous studies have, therefore, attempted to examine the relationship between financial inclusion and economic growth as well as how access to finance reduces income inequality. These studies used either single indicators to represent financial inclusion or an index (constructed from only bank data) to represent financial inclusion. These studies, however, failed to use a comprehensive financial inclusion index in investigating the impact of financial inclusion on economic growth and income inequality. This study, therefore, fills the literature gap by examining the effect of financial inclusion on economic growth and income inequality in Africa using a comprehensive financial inclusion index. Further, this study adds to the empirical literature by investigating the threshold effect of financial inclusion (using our comprehensive financial inclusion index) on economic growth and income inequality in selected sub-Saharan African countries.

Third, the existing literature suggest that access to finance is central to attaining inclusive growth (that benefits all economic agents including women), closing the gender equality gap, and helping to empower women in the process (Aziz et al., 2022; Demirgüç-Kunt et al., 2013; Siddik, 2017b).

There is, however, significant discrimination against women in respect to access to finance, which makes women more financially excluded compared to men (Aziz et al., 2022; Demirgüç-Kunt et al., 2013; Siddik, 2017b). This has been identified as a major global concern because women form majority of the world's population; including Africa (Aziz et al., 2022). The empirical literature has, therefore, suggest that expanding women access to finance must be a priority to governments, policy-makers, and development organisations (such as the World Bank, the African Union, and International Monetary Fund) because access to finance would empower women and significantly benefit the world as a whole (Adera & Abdisa, 2023; Aziz et al., 2022; Field et al., 2021; Jayachandran, 2015; Yaumidin et al., 2017). A review of existing literature show very limited studies (mostly focused on Asia) on the relationship between access to finance and women empowerment. This highlights a significant literature gap on how financial inclusion impacts women empowerment in Africa. This study seeks to bridge this literature gap by focusing on the African context.

To address the highlighted gaps in the existing literature:

Chapter 2 discussed the creation of a comprehensive financial inclusion index for selected Sub-Saharan African countries and investigates the key factors that drive financial inclusion in the sampled countries. First, the chapter developed a financial inclusion index using both bank and insurance data. The literature suggest that financial inclusion is a multidimensional concept so the study used three dimensions; namely depth, access and efficiency, to construct the financial inclusion index. Depth (being private-sector credit to GDP, pension fund assets to GDP, mutual fund assets to GDP, life insurance premiums to GDP, and non-life insurance premium to GDP, access (being bank branches per 100,000 adults and ATMs per 100,000 adults), and efficiency

(being net interest margin, lending-deposits spread, non-interest income to total income, and overhead costs to total assets). In line with recent studies, the study used the principal component analysis (PCA) approach in creating the financial inclusion index for Africa (such as Cámara & Tuesta, (2014), (Jolliffe, 2002), Nsiah & Tweneboah, (2023), and Omar & Inaba, (2020)). Second, the study examines the factors that drive financial inclusion in Africa.

Chapter 3 examined the threshold effect of financial inclusion on economic growth (per capita GDP) and the threshold effect of financial inclusion on income inequality (GINI coefficient) in Africa.

Chapter 4 focused on how financial inclusion impact women empowerment in Africa.

Lastly, Chapter 5 summarised the research and its findings, highlighted the contributions of the study and implications of the findings, limitations of the study, and recommended directions for future research

5.3 Major findings of the Study

Financial inclusion index (FII) for Africa and factors that drive financial inclusion in Africa

Financial inclusion scores lie within a range of 0 and 1; with a score of 0 representing no financial inclusion and score of 1 representing absolute financial inclusion. The landmark study by Sarma (2008) provides a classification for financial inclusion scores: that is low financial inclusion (0 - 0.3), medium financial inclusion (0.3 - 0.5), and high financial inclusion (0.5 - 1.0).

From the results of the study (see Figure 2.2), therefore, only Sierra Leone that recorded an average financial inclusion index of 0.30 can be classified as a medium financial inclusion country in Africa

whilst the other countries (that is Botswana, Gambia, Tanzania, Kenya, Nigeria, Mozambique, Cameroon, Lesotho, Burkina Faso, Uganda, Congo Dr. Rwanda, and Madagascar) are classified as the low financial inclusion countries during the study period. This means that 92.85 percent of the African countries used in this study fall in low financial inclusion category. The trend in our finding is consistent with recent studies. Nsiah et al (2023) found that majority of the African countries also fell in the low financial inclusion category. The positive sign, however, is that the study finds that an upward yearly trend in the level of financial inclusion in Africa during the study period, which gives the comfort that most of the African countries would soon move into medium to high financial inclusion categories in the very near future.

In respect of the factors that drive financial inclusion in Africa, the study finds evidence to suggest that inflation and urbanisation increase the level of financial inclusion whilst dependency ratio, and gross national income per capita dampen the level of financial inclusion. Domestic credit to the private sector, education, money supply were, however, found to have insignificant relationship with financial inclusion in Africa during the study period.

Threshold effect of financial inclusion on economic growth and income inequality in Africa

Objective 2 (a) examined the threshold effect of financial inclusion index on economic growth in Africa. The study found a significant positive influence of financial inclusion on economic growth at a threshold in Africa during the study period. The threshold results indicate that when FII is less than 0.37 (that is $FII < 0.37$), the coefficient is insignificantly positive, which suggests that economic growth is insensitive to FII as financial inclusion falls below this region. However, when FII is equal to or greater than 0.37, the coefficient is significantly positive, which suggests that economic growth improved when FII increases beyond 0.37 score (that is $FII > 0.37$). The study

further examined the relationship between economic growth and other factors and found that population growth and inflation exhibited a significant influence on economic growth whilst remittance, capital, domestic credit to private sector, government spending, and money supply exhibited insignificant impact on economic growth in Africa during the study period.

Objective 2 (b) examined the threshold effect of financial inclusion index on income inequality in Africa. Similar to previous studies, the study adopted the GINI coefficient as proxy for income inequality in Africa. The results indicate that the financial inclusion must be above a threshold value of 0.05 to influence income inequality in Africa. During the study period, the average financial inclusion indexes for each of the sampled countries were above threshold of 0.05, which means that financial inclusion benefitted the selected countries by reducing their income inequality during the study period. Examining the relationship between income inequality and other factors, the study found that population growth, rule of law, and GNI significantly influenced income inequality whilst inflation, domestic credit to private sector, government spending and education were all insignificantly related with income inequality in Africa during the study period.

The Effect of Financial Inclusion on Women Empowerment in Africa

The literature suggests access to finance is critical to inclusive growth but women are more prone to being financially excluded compared to men (Adera & Abdisa, 2023; Aziz et al., 2022; Hendriks, 2019; Siddik, 2017b). The literature suggest that lack of women access to finance (or being financially excluded) dampens women empowerment (Adera & Abdisa, 2023; Aziz et al., 2022; Hendriks, 2019; Siddik, 2017b). The study employed the panel ARDL to estimate the long-run and short-run relationships between financial inclusion and women empowerment in Africa. Similar to recent studies, the study used gender inequality index as a proxy for women

empowerment in Africa (Braverman-Bronstein et al., 2023; MacArthur et al., 2021). The study found that financial inclusion improved women empowerment in short run but decreased the level of women empowerment in the long run in Sub-Saharan Africa.

5.4 Research Contribution and Research Implications and Policy Recommendations

The study's findings make several research contributions and identify several implications and policy recommendations as follows:

5.4.1 Research Contribution

The study has made some significant contributions to research. First, unlike previous studies that used only bank information, this study developed a comprehensive financial inclusion index using both banking and insurance data. Thus, this study cures the limitation in previous that used either a single indicator, which does not capture the multidimensional nature of financial inclusion, or as an index constructed from only bank data. Second, based on the comprehensive financial inclusion index, the study examined the threshold effect of financial inclusion on economic growth and income inequality in Africa. The study revealed that financial inclusion threshold scores equal to or above 0.37 and 0.05 were required to positively impact economic growth and income inequality; respectively, in Africa. A review of the existing literature and to the best of my knowledge, no known study has investigated a threshold effect between financial inclusion and income inequality in Africa. Finally, this study examined the effect of financial inclusion on women empowerment, which is a missing empirical study on Africa; most of the studies on effect of financial inclusion on women empowerment have been focused on Asia. This study, therefore, added to the existing empirical literature by examining the relationship between financial inclusion and women empowerment within the African context.

5.4.2 Research Implications and Policy Recommendations

5.4.2.1 The Government and Policymakers

First, findings from this study show that African countries should implement policies and programmes that create a steady macroeconomic environments (such as stable exchange rate, low inflation and interest rates) and stable political climate (such as strong and sustained democracy, high levels of rule of law, fight against corruptions, public confidence in independence of the various arms of government). Second, the policies must also create a conducive business environment that supports private sector growth. Private sector growth tends to encourage job creation (that boost and sustain income levels), stimulates economic growth, reduces inflation, and reduces income inequality amongst individuals and households. Third, women can significantly benefit from improved access to finance, Government policies must encourage financial inclusion amongst women because that can lead to women empowerment; particularly in the short-term.

5.4.2.2 The Regulators and the Providers of Financial Services

The study provides evidence to suggest that high levels of financial inclusion improve economic growth and reduce income inequality in Africa. Therefore, regulators of the financial sectors of the various countries must design rules and regulations that create confidence in the financial sector (such as ensuring the financial sector is sound and institutions in the sector do not fail) to encourage the patronage and usage of the formal financial sector by all economic agents. They must reduce the prevalence of financial exclusion, to improve the level of financial inclusion in Africa. Also, providers of financial services (such as the banks and insurance companies) must develop and offer women-related products and services or products and services that resonant with women so as to improve the patronage and usage of the formal financial sector amongst women; especially in the short-run. In addition, regulators and providers of finance must embark on financial literacy

programmes and integrated advice so as to demystify the perception that the formal financial sector is reserved for men, the educated and rich individuals only. Overall, the regulations and rules must help to expand depth, increase access, and improve efficiency in the financial system to improve the level of financial inclusion in the countries whilst reducing barriers to the formal financial sector.

5.5 Study Limitations and Future Studies

5.5.1 Limitations

Like previous studies, there are some limitations inherent in this study. Some of the limitations of this study include the following. First, availability of data was a challenge in this study. Second, the concept of financial inclusion is a multidimensional and the literature suggest several other dimensions of financial inclusion (such as barrier and quality) but due to data availability challenges these other dimensions were not included in constructing the financial inclusion index in this study. Third, the study assumed the countries are on the same income levels (that is low-income, medium-income, and high income countries) but in reality, the countries can be classified into low-income, medium-income, or high income countries respectively.

5.5.2 The Future Studies and Researchers

It is worthy of note that notwithstanding the fact that above are identified as limitations to this study, they offer directions for the future researchers.

First, the literature suggest that digital finance (such as mobile money service) is helping the otherwise financially excluded (particularly the poor, women, uneducated, and those in rural and remote areas where traditional financial services are unable to adequately serve), to be financially

included. Therefore, we recommend that future studies should consider creating a financial inclusion that incorporates the mobile money service. Second, countries are classified into low-income, medium-income, or high income levels so futures may consider investigating the determinants of financial inclusion based on the income classifications of the respective countries. Third, future studies may consider investigating the relationship between financial inclusion and the various components of the gender inequality index because it would provide fresh insight on the extent to which the variables of gender inequality index individually influence financial inclusion. Last, future researchers may consider estimating the time-related threshold effect of financial inclusion on women empowerment in Africa and estimate the exact time at which financial inclusion no longer empowers women in Africa.

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APPENDIX

Appendix 1: Descriptive Statistics of Component of Financial Inclusion Index per Country

Country	Variable	Depth	Access	Efficiency	Country	Variable	Depth	Access	Efficiency
Sierra Leone	Mean	0.0243591	0.0255364	0.3373864	Cameroon	Mean	0.0479545	0.0273864	0.4788545
	Std. Dev.	0.0077213	0.0090957	0.0770141		Std. Dev.	0.0061378	0.015578	0.0429484
	Min	0.0089	0.0107	0.1395		Min	0.0373	0.0061	0.4093
	Max	0.0345	0.0328	0.4236		Max	0.0567	0.0475	0.5631
Botswana	Mean	0.3518909	0.2192727	0.64505	Lesotho	Mean	0.2204727	0.0712136	0.5285727
	Std. Dev.	0.0570019	0.058371	0.0565223		Std. Dev.	0.0294882	0.0292597	0.063908
	Min	0.2081	0.1262	0.5541		Min	0.1773	0.0355	0.3912
	Max	0.4176	0.3123	0.7224		Max	0.2688	0.1097	0.6079
Gambia	Mean	0.03555	0.0943864	0.4459273	Burkina Faso	Mean	0.0603364	0.0382	0.5643909
	Std. Dev.	0.0074912	0.0323396	0.0755937		Std. Dev.	0.0202384	0.0141171	0.0861481
	Min	0.0195	0.0476	0.2749		Min	0.0358	0.0209	0.3466
	Max	0.0474	0.1253	0.5784		Max	0.1009	0.0588	0.6532
Tanzania	Mean	0.0657864	0.0351955	0.4852182	Uganda	Mean	0.0713909	0.03815	0.4763591
	Std. Dev.	0.0159264	0.0214784	0.0629665		Std. Dev.	0.018413	0.0148601	0.0518265
	Min	0.0336	0.0029	0.3757		Min	0.0474	0.0167	0.4016
	Max	0.0885	0.0556	0.6025		Max	0.1093	0.0562	0.5729
Kenya	Mean	0.1760227	0.0753045	0.4976364	Congo DR	Mean	0.0162455	0.0092409	0.2436773
	Std. Dev.	0.015369	0.0287601	0.0882626		Std. Dev.	0.0077944	0.004454	0.0802879
	Min	0.1479	0.0316	0.3021		Min	0.0021	0.0046	0.157
	Max	0.2063	0.1083	0.6303		Max	0.0314	0.0179	0.4629
Nigeria	Mean	0.0553136	0.1015364	0.4988	Rwanda	Mean	0.1044	0.0544727	0.4429091
	Std. Dev.	0.0121111	0.0336206	0.0574559		Std. Dev.	0.0572957	0.0385862	0.0934105
	Min	0.037	0.0522	0.3837		Min	0.0524	0.0045	0.2925
	Max	0.0747	0.1371	0.5855		Max	0.2365	0.0991	0.6924
Mozambique	Mean	0.0743455	0.0652955	0.4757045	Madagascar	Mean	0.0483773	0.0263091	0.5496909
	Std. Dev.	0.0274181	0.0261381	0.0850263		Std. Dev.	0.0079112	0.0117295	0.0639789
	Min	0.0357	0.0298	0.1916		Min	0.0376	0.0115	0.4469
	Max	0.1126	0.0997	0.6364		Max	0.0708	0.0487	0.6848

Source: Author's own calculations, 2024