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**DETERMINANTS OF FINANCIAL INCLUSION IN SUB-SAHARAN AFRICAN
COUNTRIES**

BY

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201700197

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ABSTRACT

Financial inclusion is considered one of the major parts of economic development catalysts across the globe, including the sub-Saharan African countries. It has been a dynamic instrument in achieving inclusive and sustainable macroeconomic objectives (growth, employment generation, economic and income stability, income equality, and poverty reduction). Furthermore, in recent times, Financial Inclusion has been on the rise in the sub-Saharan Countries, but yet to be reflected on the reality on ground, as many people are still left unincluded in the area of use, thereby necessitating a look into the variables that determines and by implication drives financial inclusion. Therefore, this study examined the determinants of financial inclusion in Sub-Saharan African countries. It adopted a quantitative method, focusing on 15 selected sub-Saharan African countries. This study considered Financial Technology, Financial Education, Economic growth, Domestic Credit to Private Sector and Bank Concentration as determinants of financial inclusion. Panel data sourced from the World Bank Global Findex and other statistical bulletin for the period of 2011 to 2021. This study considered a correlation matrix adopting Pearson correlation coefficients that is employed in order to understand the relationships between various variables present and also to detect the existence of a multicollinearity problem. Likewise, Principal Components Analysis (PCA) was applied to selected data in a manner that maintains most of the information to generate a financial inclusion Index, used as dependent variable in the study. Multiple regression was done using the difference GMM technique. The findings revealed that financial education, economic growth, employment and domestic credit to the private sector, significantly contributed to financial inclusion. It is therefore recommended that there is a need to steer policies towards technological infrastructure to enhance financial inclusion and others to achieve more Financial Inclusion in the region.

Keyword: Financial Inclusion, Financial Technology, Financial Education, Bank Concentration, Employment, Economic growth, Domestic Credit to Private Sector Principal Components Analysis (PCA), GMM

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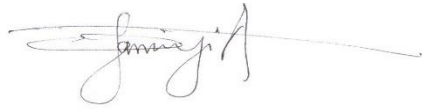
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DEDICATION

To God Almighty,

To my sweet mum - my Gold of inestimable value, who was still alive when I first submitted this work for grading but unfortunately passed away before this time that I am doing this final submission. May your loving and gentle soul continue to rest in eternal peace. I miss you mum! But your love, lessons and legacies will remain with me as I navigate into the future. Love you mum!

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CHAPTER 1

INTRODUCTION AND BACKGROUND

1. Introduction

Financial Inclusion is considered a major part of economic development catalysts (Yanina, Loktionova & Egorova, 2020; and Mostafa, Ashraf & Marwa, 2023). Omar and Inaba (2020) highlighted it as a dynamic instrument for realizing inclusive and sustainable macroeconomic objectives (growth, employment generation, economic and income stability; income equality and poverty reduction); for both advanced and developing countries. This view is supported by Ouechtati (2020) and Bakari et al., (2019), emphasizing that financial inclusion can reduce poverty and inequality, not leaving out the enhancement of financial stability and economic growth as well. To buttress this, a strong relationship is documented between economic growth and financial development in the literature (Oroud, Almahadin, Alkhazaleh & Shneikat, 2023; Wentzel & John, 2016 and Kumar, 2019).

The World Bank (2021) and Chikalipah (2017) pointed out that many countries in Sub Saharan Africa have continued to witness significant financial sector deepening since early 2000s, necessitating the provision of increased financial facilities, particularly credit. Similarly, mobile money (new technologies) continues to assist in broadening financial services' access (World Bank, 2022). The World Bank Group - WBG (2022) further reported that the average rate of account ownership improved in developing countries, increasing by 8 percent (from 63% to 71%) of adults between 2017 and 2021. The surge was attributed to COVID-19 pandemic which made 18 percent of adults (whose one-third did so for the first time) paid utility bills directly from account in 2021. However, the linkage of this expansion to the mobile money adoption in Sub-Saharan region, agrees with the views of Bashiru et al., (2023) that the financial systems of many African countries, particularly Sub-Saharan's are still underdeveloped compared to their developing counterparts. Financial inclusion, hereafter referred to as FI, in the Sub-Saharan region is the world's lowest. Specifically, in terms of bank account infiltration in the region, Botswana and Chad are the lowest, with two-third of their adult population lacking formal financial services' access. This impairment in accessing formal financial services deepens

the existing inequalities in society. Meanwhile, Prymostka et al., (2020), indicated cost as part of the reasons for the lack of attention to the need of the lower class in terms of financial services because the delivery of smaller financial products yields lesser financial return compared to its operating costs. Nonetheless, FI has become a global factor in addressing poverty and inequalities such that the World Bank prioritized financial access as one of its global objectives by 2030 (Diatha & Yadavalli, 2016 and Mhlanga, Dunga & Moloi 2020); still, financial inclusion is yet to be achieved in Sub-Saharan Africa countries because the concern has always been in the measure of FI whereas, there is need to look into the determinants of FI, which could drive financial inclusion. This makes the study of determinants of FI crucial today due to the high level of poverty in the world and the predominant financial exclusion in many Sub-Saharan societies, to incorporate and enable access to the use of financial services by the erstwhile excluded class of society, mainly the poor and the vulnerable.

Financial Inclusion is defined as a process whereby access to financial services is guaranteed adequately and timely in areas of need (Riley, 2019). Also, Omar and Inaba (2020) defined FI as the whole effort geared towards putting proper financial services at the reach of primarily low-income people at affordable price. World Bank (2021) suggested that the advent of FI through availability, ease of access and formal financial services usage by the “newly banked” benefits immensely from the possibilities of savings, payment, borrowings, and insurance, (which are primary financial services) can promote social inclusion. Meanwhile, despite the decades of progressive efforts at attaining FI and increasing prosperity, almost One-third – 24 percent of the world population remains financially excluded (WBG, 2022); half of which is said to be predominantly poor households and women, those out of the workforce or people in the rural areas. The more reason Ouechtati (2020) indicated that the poorer population are still struggling to achieve the lowest living standard across developing areas, especially in the Caribbean, Africa, Asia, and Latin America.

The existing barrier to FI increases the number of people financially excluded, forcing them to rely on informal financial service providers that rip them off and plunge them deeper down the poverty line. However, Financial exclusions could be voluntary or

involuntary (Clamara et al, 2014 and Abel et al., (2018). Voluntary exclusion covers those excluded not because of externally imposed barriers but due to self-imposed barriers hinged on perception, belief, or conviction. Voluntary exclusion is defined by the World Bank (2021) as situation whereby a fraction of the households or firm chooses not to make use of formal financial services, owing to their (perceived) lack of need for them, religious beliefs, or cultural reasons. These are not the prime target of FI drive, rather those excluded involuntarily by circumstances beyond their control. On the other hand, World Bank (2021) maintained that involuntary exclusion occurs due to inadequate income, discrimination due to high-risk profile, financial markets imperfections and failures. Lots of those excluded in Sub-Saharan Africa (hereafter referred to as SSA) are excluded involuntarily. The involuntary component, which constitutes a barrier to FI can be taken care of with focus on determinants of financial inclusion driven by suitable programs and economic policies to increase income and correct market imperfections and failures of the financial providers via policy and research initiatives.

The World Bank (2018) reported that above half of the world's extremely poor live in SSA; making it a prime place for testing the drivers (determinants) of FI to see if the inclusion of the poor and the vulnerable in formal financial services could be achieved and improve FI in the region. Meanwhile, the vast differences existing in the SSA regions in terms of GDP, poverty levels and steep inequality levels which could be a possible issue of concern for financial inclusion and probably constrain taking the whole sub-continent as a single unit because of the danger of shallow generalisations are taken care of with the strength of panel data dynamics and the introduction of dummy variable into the model. Therefore, the study will still be able to sufficiently analyse the determinants of financial inclusion focusing on the SSA region as a unit.

Mhlanga, (2020); Kaur & Kapuria (2020) and Mhlanga and Denhere (2020) identified age, gender, income level, level of education, financial institution development, mobile money, economic growth, employment status among many others world over as financial inclusion's determinants. Clamara et al., (2014) opined that, mortgages and loans appear to be better drivers (determinants) of financial inclusion with regards to financial products, than saving products, while education and formality constitute the significant factors for

financial inclusion for enterprises. Moreover, it is obvious from the WBG (2022) report that a gap still exists between access to financial services and its usage in SSA. The big issue is about what really counts for (or determines) financial inclusion instead of just measuring FI. Because, in measuring financial inclusion progress, the number of active accounts reporting in a country has become a common way of doing that. Whereas, as account opening and its access increases, more solid determinants are required in understanding the phenomenon of people's use of financial services, with prime focus on digital financial services. Moreover, while financial services' access is deepening in the developed world, mobile money seems to be the main driver of the increase in financial inclusion in the region, since it is only SSA region that recorded over 10 percent of adults with mobile money account. This calls for a serious evaluation. It is against this background that the present study seeks to understand the determinants of financial Inclusion in Sub-Saharan Africa countries to improve FI in the region.

Financial inclusion is considered a major answer to the question of income inequality, reducing poverty, and even providing stimulus for employment and economic growth (Ouechtati, 2020). Thus, lots of works has been done on financial Inclusion in relation to the above-named macroeconomic variables and many others (Mhlanga, 2020; Chikalipah, 2017; Nandru et al., 2016 and Olaniyi, 2016), Meanwhile, financial systems in the real-world remains far from inclusive. This could be attributed to the fact that only a few in-depth works exist on the determinants of FI such as that of Abel, Mutandwa & The determinants of financial inclusion was examined by Roux (2018) in Zimbabwe and posited that age, financial literacy, income, education, and internet connectivity are certainly related to financial inclusion and further submitted that the documentation required to open bank accounts and the distance to the nearest access point are negatively related to financial inclusion. Also, the impacts of information and communications technology, internal conflicts, economic growth, institutional quality, and remittance inflows on financial inclusion was investigated by Murshed et al., (2023) in selected South Asian countries. And it was discovered that higher mobile subscriptions, lower levels of corruption and internal conflict resolution improve financial inclusivity while higher economic growth inhibits financial inclusion in South Asia among others. Besides, studies that particularly focus on SSA, which carefully analyze the importance of such

factors that stimulate FI is much more limited. It is very important to know what the determinants of FI are, because they serve as drivers of FI; without which a gap between the emanating figures from access and the reality of usage (which WBG, 2022 also acknowledged) will continue to exist.

Despite the highlighted fact in the background about the United Nations' member countries incorporating financial inclusion as a crucial objective and pronounced target in their development program and the growing interests and figures emanating to validate progress made on FI, a gap still exists between the emerging figures on access and the facts on ground with regards to usage (Simatele, 2021). This gap is apparent from the recent WBG (2022) report which indicated increase in percentage of access to banking services in developing nations at 71% in 2021, only 55% in SSA; driven mainly by mobile money account, indicating that majority of SSA are still excluded from taking advantage of vast formal financial services, as the same report pointed out that many still rely on their personal networks to raise money in emergency, meaning that approximately 45% of the population in SSA are still without banking accounts.

The problem rest on the factors that have been the subject of focus - measuring FI, such that when an individual opens a bank account, the person is considered financially included not minding if the account is used or not and the possibilities of such account owner's ability to secure other banking services like accessing a loan. No wonder Riley, (2019) supported by Nanziri & Leibbrandt, (2018) and Louis & Chartier (2017), maintained that the issue with FI in part is associated with the fact that, the banking industry of most African countries mainly limits access to capital-stock to the rich and is an extremely concerted spring of wealth to the affluent. This ought to be challenged for financial services usage and not just access to be more inclusive because account opening does not mean or translate into inclusion, and it is in giving the determinants of FI attention that FI could be properly driven particularly in SSA. Nanziri & Leibbrandt, (2018) raised a vital issue of market failure and FI, submitting that factors responsible for market failure, such as information asymmetry, market control among others impedes FI as well. These factors are not measures of FI, but they are determinants that can drive FI and this is worth looking into. Therefore, it's imperative to examine the determinants of FI in SSA to take

away the barriers in accessing formal financial services and encourage more inclusion in the region. This study seeks to bridge the gap between the issue of access and usage by analyzing how economic growth, employment, income, financial technology, and financial education could drive FI in SSA, contributing to existing literature in this regard.

In addition, many of the studies existing on the determinant of FI are country specific or bilateral: Mhlanga et al., (2020) used logit model to examine FI in South Africa; Kaur& Kapuria (2020) in Zimbabwe; and Altarawneh, Al-Nuaimi and Al-Nimri (2020) also investigated financial inclusion determinants using Global Findex database in Europe and Latin America, and Romania and Brazil. But according to Hsiao et al., (1995) using panel data is more robust and is used in this study compared to the existing ones. Because Panel data involve both cross-sectional and a time series dimension, which makes more accurate inference of model parameters possible by blending the intra-individual dynamics and inter-individual differences; and the econometric estimates efficiency is improved as more sample variability is usually present in panel data, also having more degrees of freedom compared to cross-sectional data, and there is better capacity to reveal human behavior's complexity than a single time series or cross-section data. It can be said that study on determinants of Financial Inclusion in the SSA area is still a work in progress. Thus, this study seeks to exploit this gap in research. It is against this background that the current study contends that, without an understanding of the determinants of FI, policy makers would not be able to achieve their objectives of reducing poverty, inequality, and the drive for inclusive growth. In addition, since FI is a constantly changing term, ignoring elements like financial technology and financial literacy as factors that influence FI may result in an unbalanced policy intervention. These aspects were disregarded in earlier studies, which may have been a weakness.

1.1 Research Objectives

The overriding objective of embarking on this research is to examine the determinants of Financial Inclusion in Sub-Saharan Africa countries. The specific objectives include the following:

1. This study seeks to study trends and patterns in the determinants of financial inclusion in the Sub-Saharan Africa countries.

2. The study also aims to examine empirical evidence on the drivers (determinants) of financial inclusion in Sub-Saharan Africa countries.
3. And based on the empirical results from the study, practical steps are mapped out and policy implications are articulated for policy makers and financial practitioners on how financial inclusion could be actualized more effectively in the Sub-Saharan region.

1.2 Hypothesis

H_0 : The identified¹ factors does not significantly affect financial inclusion in SSA

H_1 : The identified factors significantly affect financial inclusion in SSA

1.3 Significance of the Study

Evidence suggests that financial inclusion is a key factor in the fight against poverty and inequality (Aslan et al., 2017; Neaime & Gaysset, 2018 and Zhang & Naceur, 2019) and other studies exist on the measurements of FI, but not much is known as to what determines FI in SSA, which makes attainment of FI in SSA to be very slow. Existing studies examined effect of FI on economic growth (Demirgüç-Kunt et al., (2017); Bakar & Sulong (2018) and Kim et al., (2018) agree unanimously that FI can drive economic growth. Also, the effect of gender, income level and other family member having a bank account among many others is considered in relation to FI and it was discovered that they all have significant impact on financial inclusion (Demirgüç-Kunt et al., 2015; Onaolapo 2015; Babajide et al., (2015); and Zins & Well, 2016). But understanding the factors that affect FI in SSA can guide policy makers on which macro-economic factors to target to achieve the goal of FI and thus inclusive development.

The outcome of this research is useful for policy makers as it will guide them on projects to set up particularly in the rural areas, to educate the less privileged and help them to see the needs for their being financially included. The previously excluded from FI which

¹ *The identified variables implied in the hypothesis includes Financial Technology, Financial Education, Economic Growth, Employment level, Domestic Credit to Private sector and Bank Competition.*

are the prime target or motivation for this study - the poor, will also benefit from the outcome of this study based on the projects set up by the policy makers tailored to get them included in the formal financial services' use which will help cater for their information needs; since information asymmetry is one of the problems associated with imperfect competition and free flow of information is one of the solutions to alter such structure. Moreover, financial practitioners and policy makers could take advantage of advancement in technology (like mobile phones and internet) to provide financial education which could enlighten and expose the previously excluded to the importance, availability, benefits, as well as how to access financial services. This can help them set up small businesses in their communities, which will in turn lower unemployment and increase income for the previously disadvantaged group.

1.4 Outline of the Chapters

The study is made up of six chapters. Chapter 1 covers the introduction and background of the study, problem statement, objectives of the study, the significance of the study, , ethical consideration, delimitation and this chapter outline. Chapter 2 focuses on the analysis of trends. Chapter 3 theoretical framework and literature review. Chapter 4 focused on the research methodology. Chapter 5 is centred on the empirical analysis of data, emphasising model formulation, estimation, analysis and interpretation of results. Chapter six contains the summary, policy recommendations, areas of further study if any and conclusions of the study.

CHAPTER 2

OVERVIEW AND ANALYSIS OF TRENDS

2.1 Introduction

The relationship between financial development and economic growth remains a topic of intense debate and ongoing research. While a positive correlation between the two has been widely documented, the nature and direction of causality are still under scrutiny. This lack of clarity regarding the underlying mechanisms of financial intermediation fuels the ongoing debate. One key development in this field is the emergence of the concept of financial inclusion, which has arisen from attempts to understand the missing link between finance and economic growth.

Financial inclusion (FI) revolves around making financial services accessible and affordable for everyone. This encompasses access to credit, savings products, and other financial tools on a fair and inclusive basis. In recent years, FI has become a central tenet of development policy due to its potential to contribute to more equitable economic growth. This shift in focus is driven by a confluence of factors, including global initiatives like the World Bank's goal of achieving Universal Financial Access by 2020. Additionally, FI is increasingly recognized as a key driver of inclusive growth, as access to financial services empowers individuals and businesses to participate more actively in the economy. Understanding the various aspects of FI is critical for policymakers to design effective strategies that expand financial access and foster inclusive growth.

Financial inclusion (FI) holds immense potential for promoting economic development and reducing poverty. Access to financial services empowers individuals and businesses, enabling them to make long-term plans, invest, participate in productive activities, and weather unexpected financial difficulties (Park & Mercado, 2015). FI is also believed to contribute to long-term economic growth, poverty reduction, and macroeconomic stability (Burgess & Pande, 2005). However, effectively measuring FI and its impact remains a challenge (Hannig & Jansen, 2010). Despite progress in recent decades, particularly in emerging markets, significant gaps in financial inclusion persist. Low- and middle-income countries, especially in Africa, lagging behind global averages in terms of formal financial account ownership (Dabla-Norris et al., 2015; Demirguc-Kunt & Klapper, 2012). This

highlights the need for continued efforts to expand financial access and bridge the gap between financial development and financial inclusion.

Sub-Saharan Africa faces unique challenges in achieving financial inclusion. Compared to other developing regions, Sub-Saharan Africa countries (SSC) have significantly lower rates of formal account ownership (just 24% compared to the global average of 50%). This disparity is reflected in the limited infrastructure available. (Mehrotra & Yetman, 2015). For example, the number of ATMs per capita is drastically lower in SSC, with most countries having fewer than 6 per 100,000 adults (excluding South Africa). Similarly, bank branch density is sparse, averaging only 1 branch per 1,000 square kilometers. These access limitations contribute to the low financial inclusion rates observed in the region. Financial inclusion rates in SSC vary considerably across the region. Southern African nations boast an average of 51% account ownership, while Central African countries like the Central African Republic, Chad, and the Democratic Republic of Congo struggle with rates below 11%. This stark disparity highlights the significant challenges faced by many SSC in achieving financial inclusion.

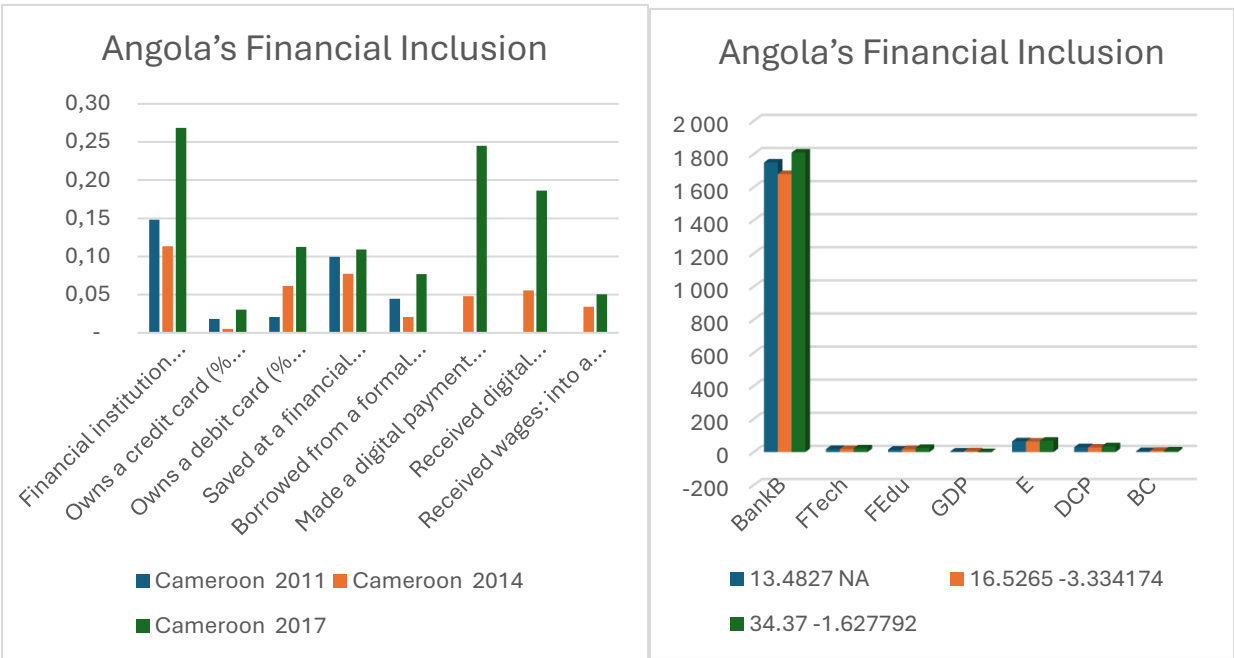
The limited access to financial services in SSC raises concerns about its impact on sustainable growth and development. Furthermore, study suggests that the effectiveness of financial inclusion hinges on a robust regulatory and supervisory framework (Mehrotra & Yetman, 2015). This underscores the need for comprehensive strategies that address infrastructure limitations, promote financial literacy, and establish sound regulatory environments to foster inclusive financial systems across Sub-Saharan Africa countries (SSC). The role of institutions in facilitating financial inclusion is gaining increasing recognition. Sub-Saharan Africa countries (SSC) well-documented challenges with institutional frameworks raise concerns about their impact on FI in the region (Ajide et al., 2015).

Study by Hategekimana, Kigabo, and Ruhara, (2019) suggest that a strong institutional environment is crucial for harnessing the positive effects of financial development on growth. This underscores the need to explore the specific factors that influence FI in Sub-Saharan Africa countries (SSC), particularly the role of institutions. Financial inclusion is

a relatively new field of study, and there's a gap in study on the linkages between FI and various socio-economic and political factors. Existing study primarily focuses on the determinants of financial development on broader economic goals. This study seeks to study trends in the determinants of financial inclusion in the Sub-Saharan Africa countries. Ajide et al., (2015)'s study delves into a critical gap in the financial inclusion (FI) literature. While there have been numerous empirical studies on FI in developing countries, few have specifically examined the role of institutional factors. This lack of focus on institutions limits the generalizability of existing policy recommendations, particularly when applied to regions like Sub-Saharan Africa (SSA) with unique contextual challenges. The study conducted by World Bank (2018) addresses this gap by investigating the specific determinants of FI in SSA, with a particular emphasis on the influence of institutional frameworks.

According to World Bank (2022), in 2011 Financial Technological advancement (FinTech) advancement in Angola was 14%, in 2012 it was 23%, in 2013, it was 38%. The increasing adoption of FinTech in Angola suggests greater accessibility to financial services, which is a crucial determinant of financial inclusion. FinTech innovations such as mobile banking, digital payments, and alternative lending platforms can help overcome traditional barriers to financial access, particularly in remote or underserved areas of Sub-Saharan Africa countries. The advancement in the FinTech industry of Angola continues to increase from 54% to 85% in 2021. The rising adoption of FinTech may indicate greater accessibility to financial services for previously underserved or unbanked populations in Angola.

Figure.2.1: The Trend in Angola's Financial Inclusion from 2011 to 2021.



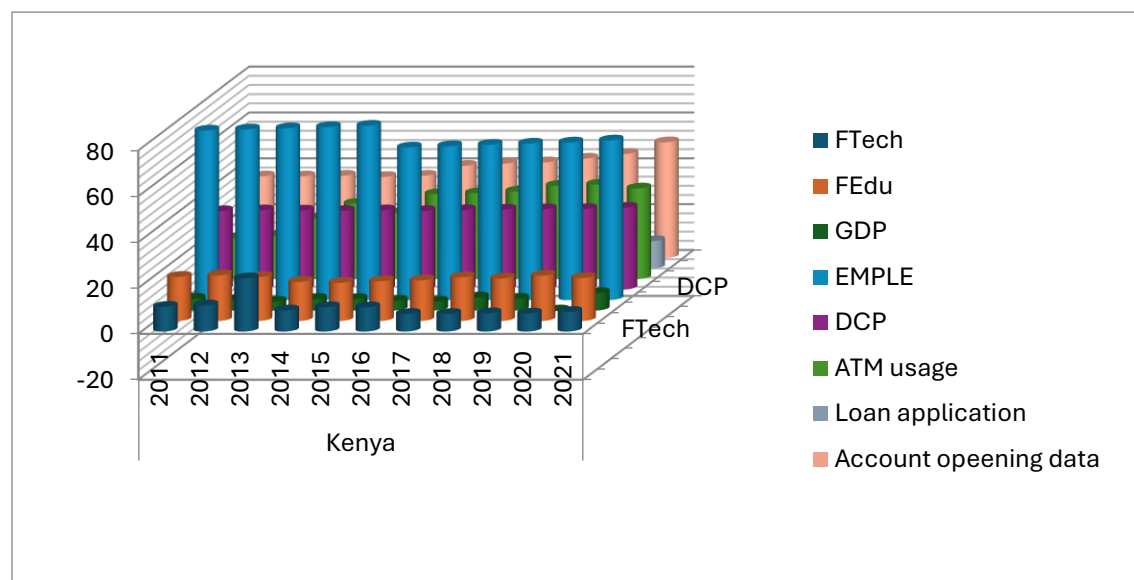
Source: World Bank (2022)

For Angola, both the diagram of financial inclusion as well as the selected economic indicators are not characterized by a definite or clear trend during the period of 2011–2017. Reduced access or usage of formal financial services is highlighted by the decline in financial institution accounts, credit card and debit card usage in the period between 2011 and 2014. Also, the low proportion of saving or borrowing from a bank further shows little formal financial intermediation among the population during the same period. The use of Digital payment first appeared in 2014, 19% individuals transacted digitally, 16% received digitally. This has been indicative of low levels of adoption of Digital Financial Instruments. Nonetheless, the lack of similar information collected before and after 2011 and in 2017 restricts further assessing the long-term changes in the use of digital finance.

Indeed, gross domestic product per capita and domestic credit to the private sector have been depicted to expand at a moderate rate over the analyzed period implying some level of economic growth but this is not associated with significant improvement in financial technology (FTech) and or financial education levels. These deficiencies in one way or

another may be producing systemically related issues with finance and technology. Further, the slow growth in bank branches and atm show a cramped-up growth in the physical banking infrastructure.

Figure .2.2: The Trend in Kenya's Financial Inclusion from 2011 to 2021.



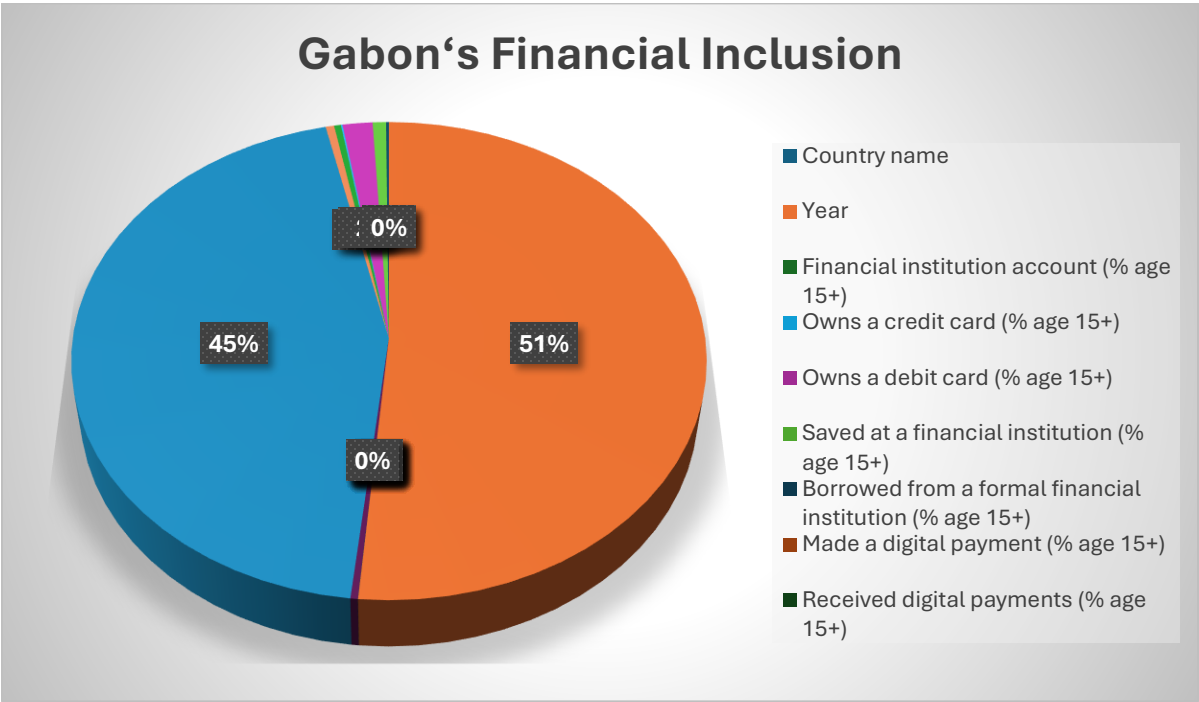
Source: World Bank (2022)

As it is observed from an analysis of the Kenyan experience in the period between 2011 and 2021, the issue of financial inclusion is not black and white. Although there was an improvement in the account ownership of the financial institution in the past, there was a drop slightly in the current period, which might indicate some hurdle in continuing account and access to the financial institution. The same inconsistency also means a pattern, where there has been increased usage of debit cards for banking services but was reduced little later, while explanation for the similar kind of pattern can be weak market, or delay in improvement in traditional banking services. The level of credit card holding did not change much, suggesting that there is little credit service utilization.

Within the digital finance subsector, there was a marked improvement in the uptake of digital payments, evidenced by the enhanced usage and receipt rates in the financial year. This implies that the transition to the digital-originated financial platforms continues

and the inward movement of the level of financial liberalization. Savings and borrowing rates exhibited some variations; while some experienced high borrowing rates but low savings, this shows that some consumers have improved financial stability and accessible credit facilities. Looking at the economic indicators including GNPs per capita, it was evident that conditions in the economy were progressively getting better. The marked rise in the FTech index points to the growing importance of technology in the financial industry. The trend shows that although the usage of ATM and the number of bank branches did not necessarily reduce steadily, it implies that the frequency of using digital channels continuously increased.

Figure .2.3: The Trend in Gabon’s Financial Inclusion from 2011 to 2021.



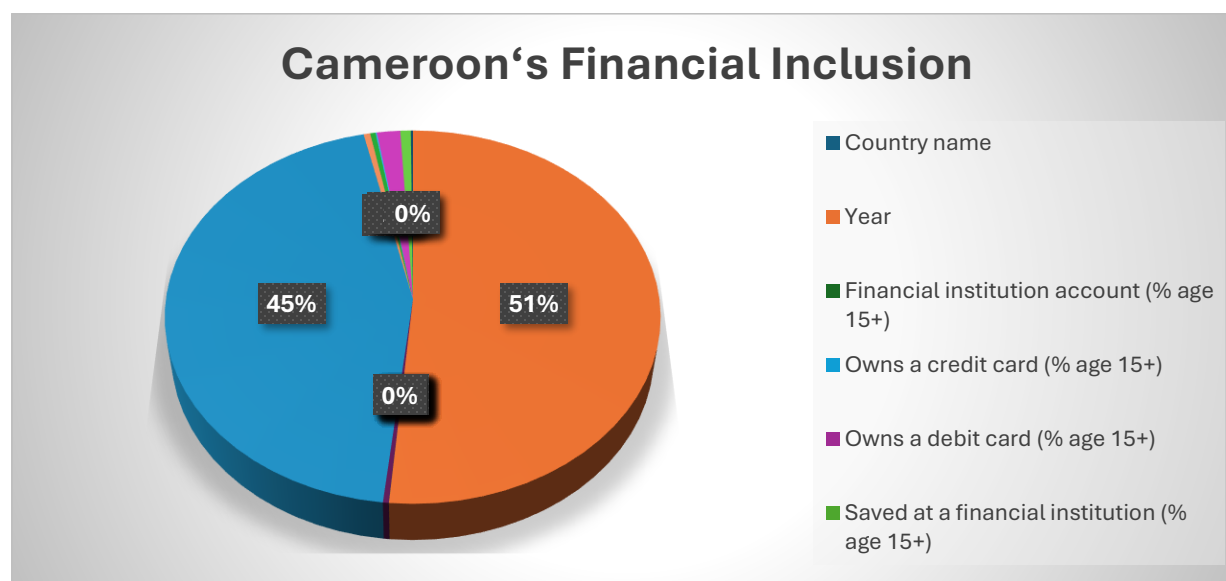
Source: World Bank (2022)

Based on the analysis of the GAFA Scoreboard, financial inclusion in Gabon is growing but remains a challenging issue in the period of 2011-2021 Figure 2. However, and for the same types of financial institutions, account ownership first rose and declined afterwards, pointing to possible saturation in the expansion of financial inclusion. Use of debit cards also indicated a similar trend while percentages for use of credit card

remained low as this marked low usage of credit facilities. Deposits and credit from mainstream financial institutions also displayed the two-part pattern indicating that formal financial services remained a peripheral experience.

Still, the use of digital financial services was observed to have a strong growth in terms of digital transactions and percentage of people who are receiving payments through such technologies. In this regard, it highlights a growing role of mobile and electronic financial instruments for improving inclusion, especially in the areas where there is a limited availability of physical financial infrastructure. But when it comes to economic and infrastructural parameters the picture is not very rosy but is not all bad. A negative change in ATM accessibility and the number of bank branches per 100000 people reveals physical points of banking. On the other hand, the propagation in the indication of FTech may have caused the increase in digital payments. However, lower financial literacy levels and the reduction of domestic credit to the private sector may reduce the prospects of extending and deepening financial inclusion.

Figure .2.3: The Trend in Cameroon 's Financial Inclusion from 2011 to 2021.



Source: World Bank (2022),

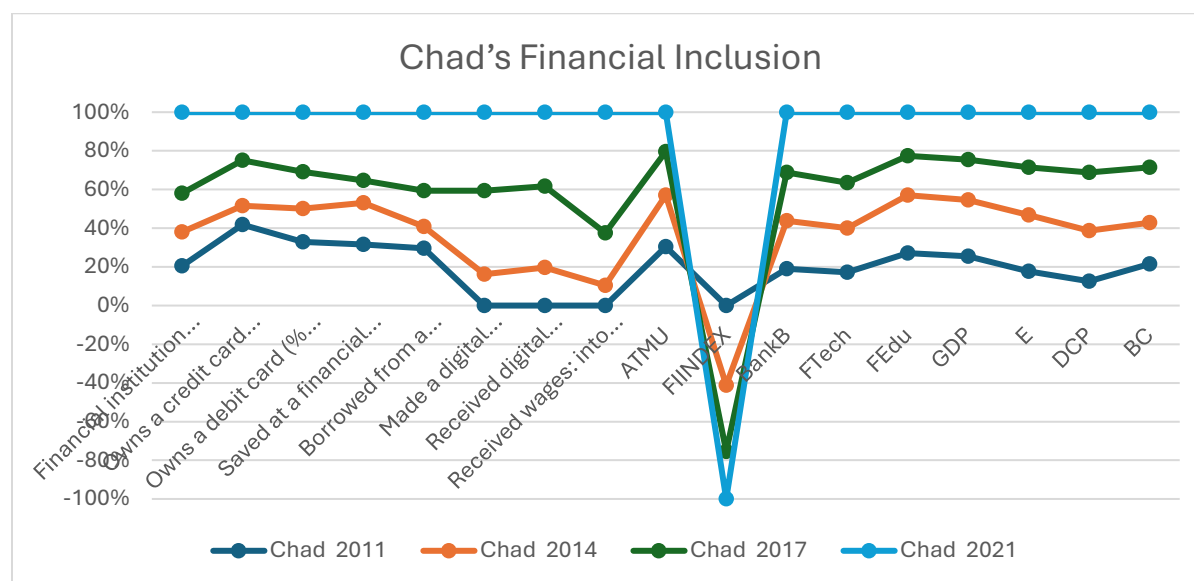
The analysis of Cameroon's road to financial inclusion between 2011 and 2021 is somewhat chequered. Although preliminary evidence of increased account ownership in the financial institution was documented, there are indications of a deterioration in the

ability to sustain access to more formal financial services. Similarly, the ownership of debit cards also positively increased, although ownership of credit card was still low, which shows that the population has not still have much confidence in traditional banking products.

Digital payments, on the other hand, showed relatively better growth, having established that the use of financial technology is taking a central role of facilitating financial inclusion among individuals, particularly the less privileged ones. The increasing usage of digital money is further supported by the constantly rising percentage of people who make at least one digital payment. However, the meagre levels of savings and borrowings from the formal financial institutions show that a large chunk of Cameroonians cannot access the key financial products.

Looking at infrastructure, there is a bit of both good and bad news. ATM usage increased at the beginning and later experienced a considerable decrease, despite the general growth, which could be attributed to customers' preference for other delivery channels or limited access to bricks-and-mortar branches. On the other hand, the growth of financial technology combined with FTech index complies with rising use of digital means of payments. Nevertheless, either lack of branch infrastructure, difficulties with financial literacy, and domestic credit to the private sector can slow down the development and further financial inclusion for all.

Figure 2.5: The Trend in Chad's Financial Inclusion from 2011 to 2021.

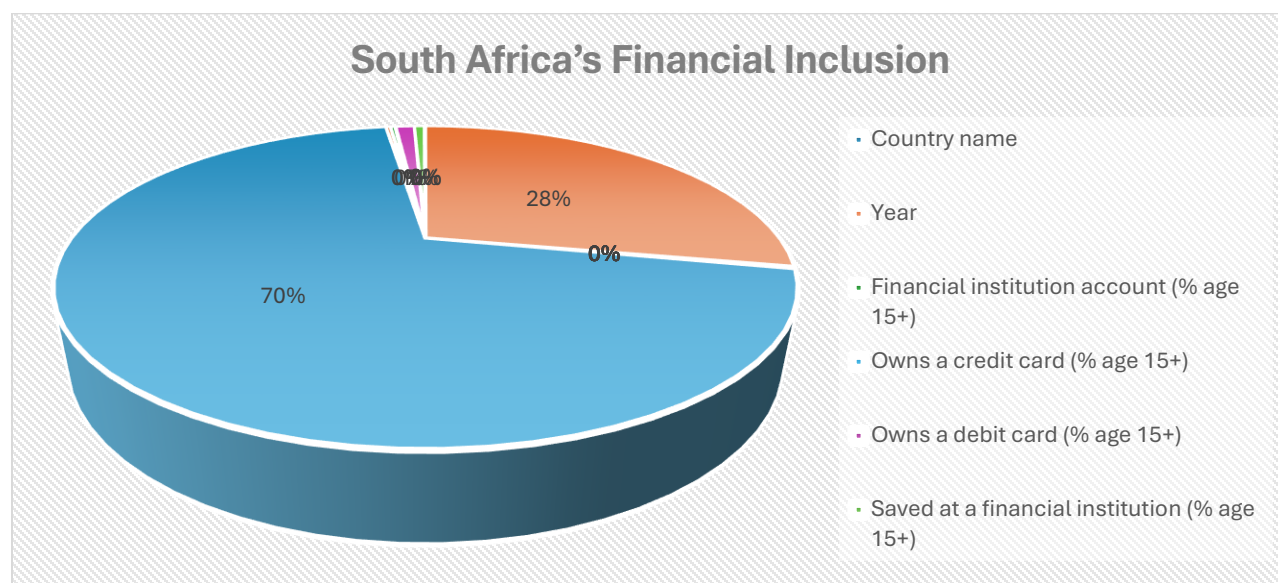


Source: World Bank (2022)

Chad's financial inclusion journey between 2011 and 2021 presents a mixed picture. While financial institution account ownership increased gradually, credit and debit card ownership remained stagnant, indicating limited penetration of traditional banking products. Savings and borrowing from formal financial institutions also showed limited growth, suggesting reliance on informal financial systems. However, digital financial services demonstrated significant growth, with a substantial increase in digital payment adoption. This signals a growing shift toward digital financial solutions, especially for underserved populations.

The economic and infrastructural context reveals a mixed bag. Modest GDP growth and an increase in domestic credit to the private sector suggest some economic expansion. However, declining ATM usage and FIINDEX indicate reduced access to physical banking services. The rise in financial technology (FTech) metrics aligns with the increased use of digital payments. Overall, the rise in account ownership and digital payment adoption demonstrates progress in providing access to financial services for a broader segment of the population. Digital finance, in particular, has emerged as a critical driver of inclusion.

Figure 2.6: The Trend in South Africa's Financial Inclusion from 2011 to 2021.



Source: World Bank (2022)

The South African financial inclusion map between 2011 to 2021 shows progressive improvement. Ownership of the account in the financial institution per household rose gradually highlighting enhanced usage of the structure formal financial systems. Another category, debit card ownership also increased to reflect the increasing usage of simple banking instruments. But, the proportion of credit cards was still low, hence, the level of credit product was still small. Nonetheless, savings rates rose which pointed to financial security regarding the citizens. This own borrowing from formal institutions changed from one period to another, indicating little demand, or restricted access to credit. There was an improvement in the expansion of Digital-Financial services. The share of clients who made and received digital payments was up sharply, testifying to technology's expanding contribution to improving financial inclusiveness and usage.

Figure 2.5: The Trend in Ethiopia's Financial Inclusion from 2011 to 2021.



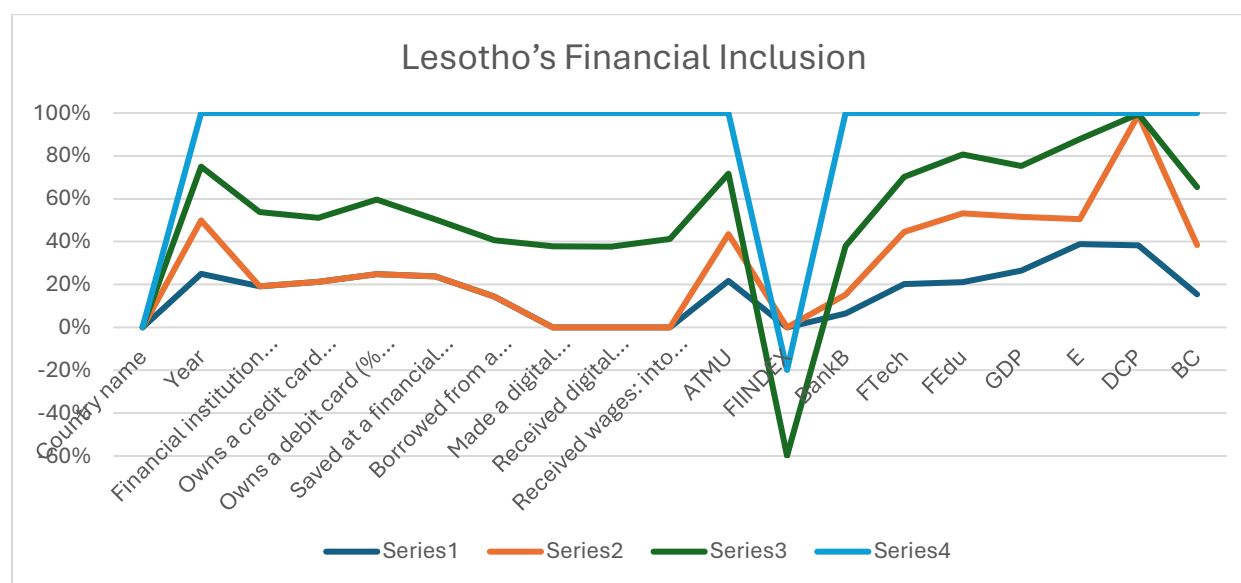
Source: World Bank (2022)

This paper analyses the financial inclusion journey of Ethiopia from 2011 to 2021 and reveals a positive trend. Ownership of accounts in a financial institution rose gradually and could be a demonstration of the expansion in the usage of the formal structures. Ownership of debit cards also rose, but not exponentially, thereby epitomizing a slow but gradual incline in the use of basic instruments of banking. However, credit card ownership, which is a subset of credit card use, remained low. Borrowing from, and saving at, more established financial institutions grew up to the second period but declined a little whereas borrowing from the established institutions seemed to have been somewhat problematic as evidenced by the up and down in credit services.

Mobile money, an aspect of digital finance was alive and growing with more and more people using mobile money to make and receive payments. This means a transition to more technological solutions to the issue of financial exclusion. The evidence of economic development can be mentioned with the help of an increased rate of economic growth, a

rise in GDP per capita and the growth of the financial sector. The high levels of the financial technology indicators correspond to the growth of the usage of digital financial services and the decline in the number of bank branches and ATM availability per capita.

Figure 2.6: The Trend in Lesotho's Financial Inclusion from 2011 to 2021.

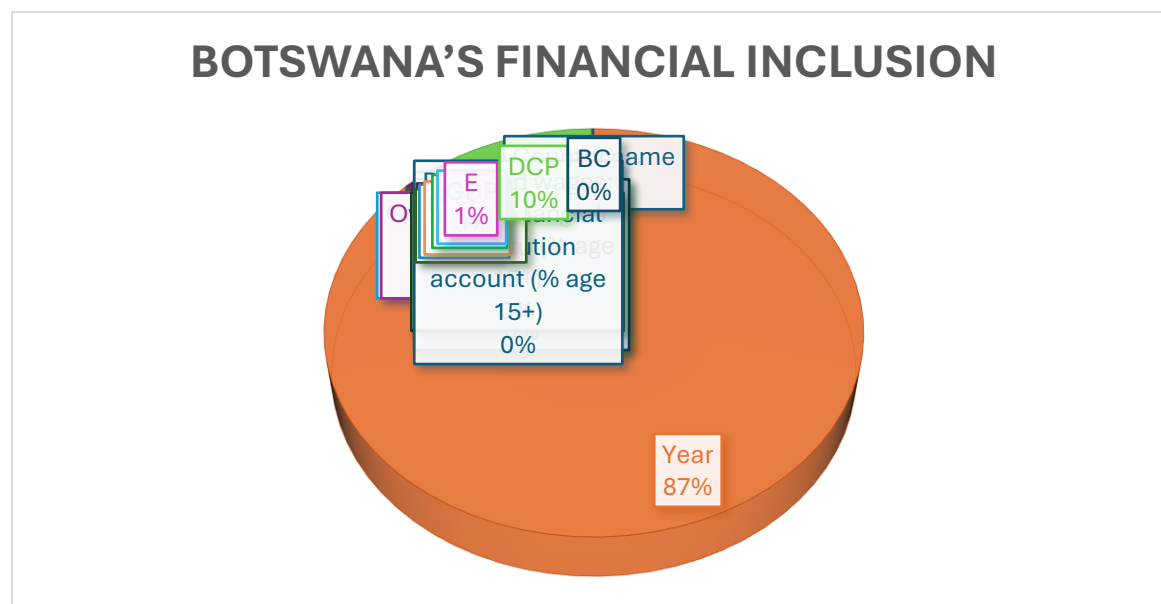


Source: World Bank (2022)

This paper shows that Lesotho has embraced the financial inclusion agenda between 2011 and 2021. The ownership of account in a financial institution also rose by a greater extend suggesting an improvement in financial inclusion of the people. Ownership of debit cards was also up, indicating improved availability of basic financial instrument. Credit card ownership, however, moderate, was also on the rise slightly. There was an improvement in savings and borrowing from formal financial institutes, which indicated better financial portfolio and trust in the above and formal banking sector. The use of digital financial services grew even further although more people were using digital payments. This signifies shift towards technology integrated financial products. Economic indices presented information showing both improvements and declines. The instability in GDP per capita remained moderate and stable levels in domestic credit to the private sector and the banking sector competitiveness indicated persistent economic activity. Similarly, the ATM facilities and number of branches per capita were also stable so there

is still an ongoing reliance in traditional branch network in tandem with the electronic channels.

Figure .2.7: The Trend in Botswana's Financial Inclusion from 2011 to 2021.

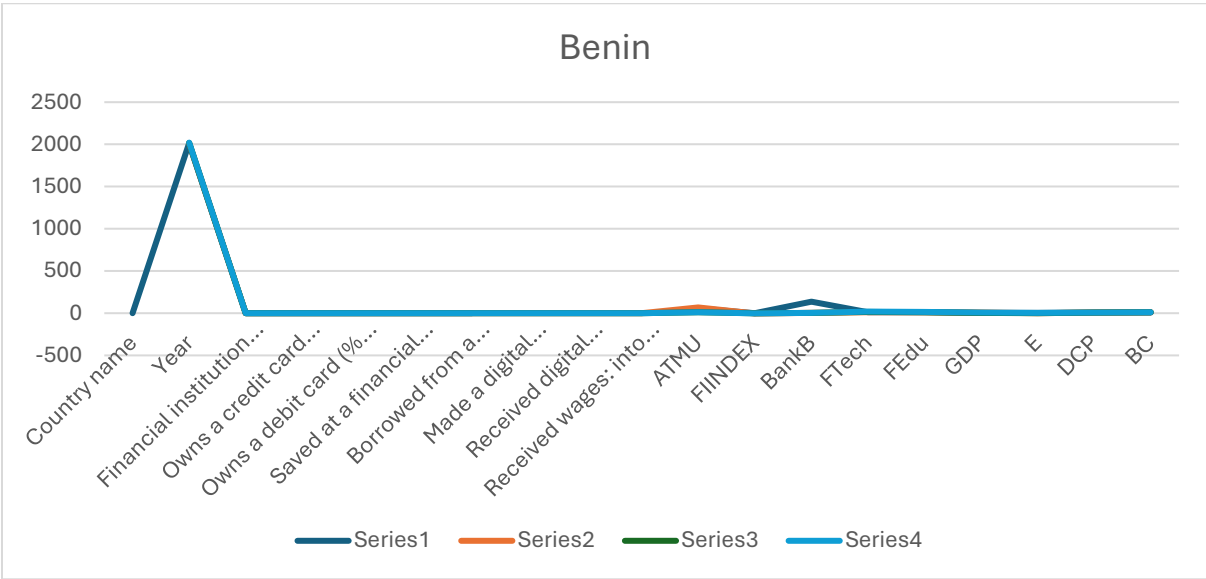


Source: World Bank (2022)

Analyzing the Botswana's revealed picture of financial inclusion during the period from 2011 to 2021, revealed a steady trend of improvement. On account ownership in the financial institutional form, there was improvement in account access showing expanded banking services access. Ownership of debit card also increased showing the debit cards usage in the daily expenses. However, the ownership of credit card was still low; this indicated low demand for credit products.

There was a small rise in the proportion saving with a formal financial institution, indicating a higher confidence in the formal credit market sources. Use and adoption of digital payments also increased significantly; this confirms that digital financial services have grown to be significant. Such disparities could be attributed to the mobile money solutions, and the developments in financial technology (fintech).

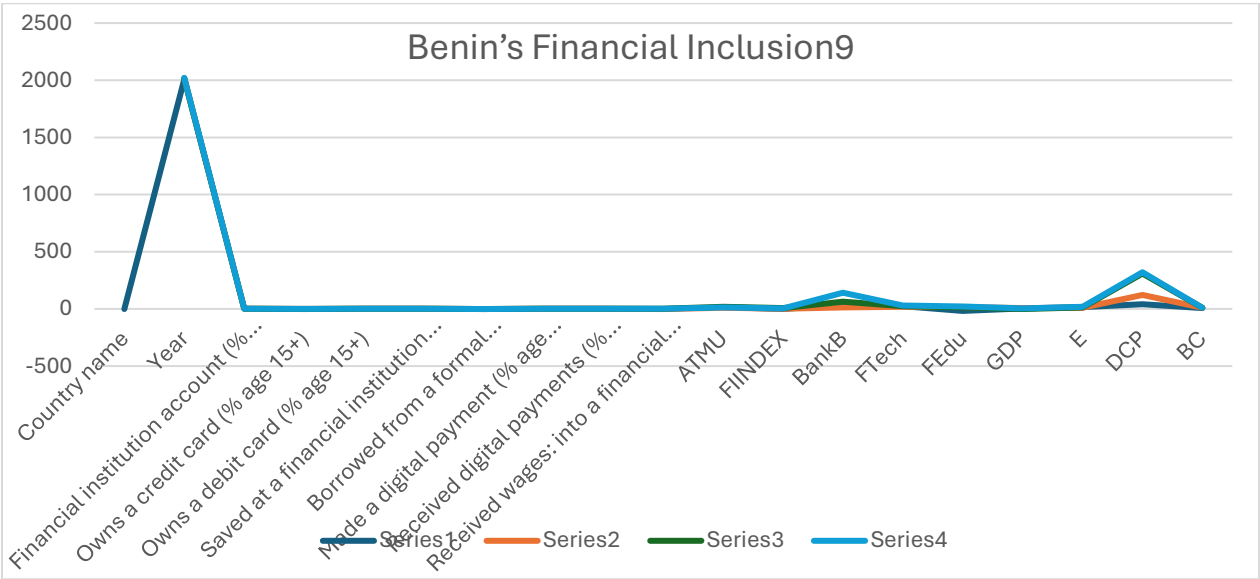
Figure 2.8: The Trend in Benin’s Financial Inclusion from 2011 to 2021.



Source: World Bank (2022)

Analyzing such key indicators as financial account ownership, and digital payments, Benin’s pictures a somewhat progressive financial inclusion story from 2011 to 2021. Nevertheless, there are bottlenecks in the usage of credit and debit cards, savers and borrowers from formal sector institutions. At The onset, financial institution account ownership was low, but it has been improving with a current statistic of still being relatively average. The ownership of a credit and debit card was equally higher but still demanding. Savings and borrowing from engineered financial institutions remained relatively low, this demonstrated that people still use informal funds. Mobile money and banking have taken root in the digital payments market and hence the growth noted. But the proportion of respondents who received wages into a financial institution account remained very low, suggesting the trend of non-formal wage payments in ZN.

Figure 2.9: The Trend in Benin’s Financial Inclusion from 2011 to 2021.



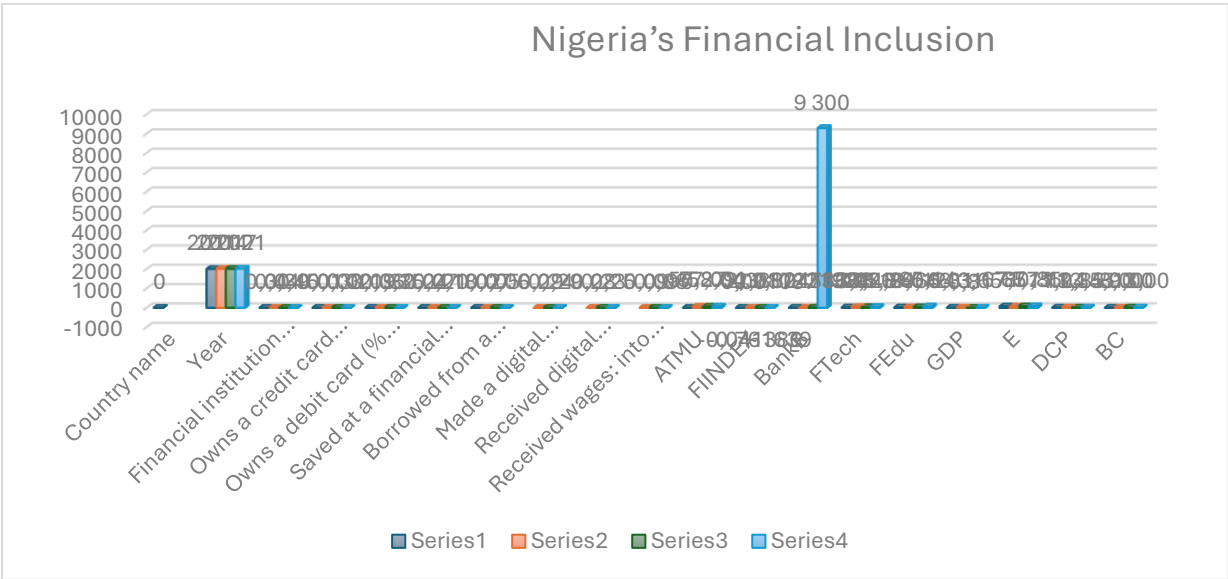
Source: World Bank (2022)

An analysis of the actors in the Beninese financial inclusion framework reveals the following developments between the years 2011 and 2021. Despite improvements in the rates of accountholder growth in financial institutions and debit card usage in the very first year and the few following it, deteriorations signify persistent constraints in entry into and utilization of superior financial services. Credit card ownership stayed below one percent the entire period under review. Deposits, along with other types of borrowing from formal financial institutions, also indicated only slight increases, which would indicate that access to credit and savings remains restricted.

On the other hand, there was an impressive growth in the provision of digital financial services, in terms of digital transactions and proportion of people using payments – digitally. This is because of the advancement in mobile technology as well as coming up with new and improved ways to finance solutions. With this in mind, the low proportion of people who reported having wages paid directly into a financial institution account shows that there is still a long way to go in formal wage payment. Hence, to make the financial system available to more people, applying fixes at the structural level: costs, facilities and

knowledge are the way to follow. To ensure Benin financial future, it will be crucial to continue and intensify its efforts in innovating, educating and integrating.

Figure 2.10: The Trend in Nigeria’s Financial Inclusion from 2011 to 2021.



Source: World Bank (2022)

The level in which Nigeria has grown its financial inclusion between the year 2011 and 2021 can be pegged on both strength and weaknesses. On the one hand there was an uptake of accounts in financial institutions, a result of measures to enhance financial inclusion, the usage of debit and credit cards was still low meaning cash and other forms of informal financial systems were still dominant. Savings and credit from the formal sector also rose only slightly and this affirmed that people had continued to struggle to build savings and access credit.

There was some growth in digital payments, but it was not very balanced, as for the latest category, many new services were reported in the country or reported limited implementation in certain regions of the country. The percentage of the working-age population paid through digital payments and wages directly into a financial institution account did not change significantly, meaning there is growing use of digital financial services, but the process of ‘financially including’ the population is ongoing. Enhancements in financial technology and education indices correspond to the

technological growth and greater consciousness crusade. However, dependency on the economic indicators and slow development in the banking facilities denote that the effort of achieving the un-served area as well as maintaining the consistency of financial inclusion remains a major struggle.

CHAPTER 3

LITERATURE REVIEW

3.1 Introduction

This study is on the determinants of financial inclusion in Sub-Saharan Africa countries which are divided into four main regions such as West Africa, Central Africa, East Africa, and Southern Africa. The West Africa is bounded by an umbrella organization called ECOWAS and it includes Nigeria, Ghana, Senegal, Cameroon, Cote d'Ivoire, among others. While Central Africa includes the Democratic Republic of Congo, Gabon and so on. Meanwhile, the East Africa includes countries such as Kenya, Ethiopia, Uganda, and others. Whereas Southern Africa communities being the last main division and it is referred to as SADC includes countries like South Africa, Namibia, Botswana, and Zimbabwe to mention a few. Therefore, this section covers the theoretical, empirical, as well as the assessment of literature on this study and the empirical literature has been considered under different themes for easy comprehension.

3.2 Theoretical Literature

Various theories can be utilized in this study, which examines the factors influencing Financial Inclusion in Sub-Saharan Africa countries through a literature review. Specifically, the theories employed include Financial Literacy Theory (FLT), Public Good Theory (PGT), System Theory (ST), and Special Agent Theory (SAT),

3.2.1 Financial Literacy Theory of Financial Inclusion

Allen and Santomero (1997) propose a theory that views financial literacy as intermediaries that address information asymmetry and reduce costs between surplus and deficit units. The theory emphasizes the significance of financial literacy in enabling individuals to make informed financial decisions, navigate complex financial environments, and develop a comprehensive understanding of the world while fostering civic responsibility. In Sub-Saharan Africa countries, where financial literacy levels are low, the theory becomes particularly important. These regions face the challenges of complex financial systems, including crypto assets, as well as risks from conflicts and climate change. Unfortunately, individuals in these areas often lack the necessary knowledge and skills to navigate these challenges, making them more vulnerable to

financial shocks and less capable of capitalizing on opportunities for financial stability and growth.

Moreover, the Financial Literacy Theory underscores the significance of closing the gaps in financial literacy to improve individuals' financial resilience. By providing people with the necessary knowledge and skills to make informed financial choices, the theory asserts that they can effectively prepare for and navigate economic uncertainties and risks. This is especially crucial in Sub-Saharan Africa countries, where individuals encounter distinct socio-economic challenges and limited access to financial services and education (Lotto, 2020a). The Financial Literacy Theory of Financial Inclusion, supported by organizations like the OECD, emphasizes the role of financial literacy in promoting overall financial well-being and inclusion. The theory suggests that improving individuals' financial literacy levels leads to increased participation in financial markets, contributing to economic growth and stability. However, the passage highlights a significant gap between the theory and the reality, particularly in Sub-Saharan Africa countries like Angola, Kenya, Cameroon, Nigeria, and South Africa (Lotto, 2020b). Despite the acknowledged importance of financial well-being, levels of financial literacy in these regions remain notably low, even among individuals who are actively involved in financial markets.

The existing disparity highlights the difficulty of translating the theoretical advantages of financial literacy into tangible results, especially in contexts where financial illiteracy is prevalent. Furthermore, the passage emphasizes the severity of the problem by noting that certain demographic sub-groups, such as women and individuals with low income and education, exhibit particularly low levels of financial literacy despite their existing financial vulnerability. This underscores the interconnectedness of financial literacy with broader socio-economic factors, implying that addressing financial literacy alone may not be enough to achieve significant financial inclusion (Mabula & Dongping, 2019).

Additionally, Malombe (2018) emphasizes the consequences of low financial literacy among high school students, suggesting that future adults may encounter difficulties in managing financial affairs. The example of Togo, where a significant number of students lack fundamental financial knowledge and skills, highlights the importance of addressing financial literacy gaps from an early age. This urgency stems from the need to secure

future financial well-being and promote inclusion among the upcoming generation (Morgan et al., 2019). The Financial literacy theory of financial inclusion suggests that individuals with higher levels of financial literacy are better equipped to make informed financial decisions. In Libya, Namibia, Togo, Gabon, Chad, Lesotho, Gabon, Namibia, and Zimbabwe, where students struggle with financial literacy, this lack of proficiency could hinder their ability to make wise financial choices in the future (Ansar, Klapper, & Singer, 2023). The Financial literacy theory of financial inclusion also implies that a population with low financial literacy may face economic challenges. When a significant portion of students lack basic knowledge in financial matters, it could impact the economic development and stability of these countries (Tucker, Jubb, & Yap, 2019). The existence of a notable disparity in financial literacy levels between countries like Rwanda or South Africa (where the proportion of students lacking proficiency is lower) and the mentioned countries underscores the importance of financial education initiatives (Prabhakar, 2019).

The Financial Literacy Theory of Financial Inclusion suggests that targeted efforts to improve financial literacy, such as implementing financial education programs in schools or offering workshops to the public, can address disparities and promote economic growth (Choinière-Crèvecoeur & Michaud, 2023). According to this theory, financial literacy increases people's will to participate in the formal financial sector. It argues that through education that enhances financial literacy, individuals become aware of formal financial services available to them and is more likely to join the formal financial sector by opening formal accounts (Kim, Yu, & Hassan, 2018).

Increased financial literacy also enables individuals to take advantage of other benefits offered by the formal financial sector, such as investment and mortgage products. Furthermore, financial literacy helps people become self-sufficient and achieve stability in their personal finances. It enables individuals to differentiate between needs and wants, create and manage budgets, save for bill payments, and plan for retirement (World Bank, 2018).

Governments with limited public funds or tax revenue may find financial literacy an attractive strategy for financial inclusion because it is relatively cost-effective to educate the population about financial management and the benefits of using formal financial

services. However, it is important to recognize the limitations of the Financial Literacy Theory of Financial Inclusion (Clark, 2023). One limitation is that it primarily addresses the willingness, rather than the capacity, of individuals to participate in the formal financial sector (Urban et al., 2020). While financial literacy can improve people's willingness to join, it does not necessarily address the capacity issue, which refers to having the financial resources to engage in financial transactions. Therefore, individuals who lack the necessary financial resources may still face challenges in actively participating in the formal financial sector, even if they are financially literate (Torp et al., 2023).

3.2.1.1 The strength of Financial Literacy Theory of Financial Inclusion

Financial literacy promotes wise financial decisions, which increase stability and resilience in Angola, Libya, and Togo. In Algeria, Namibia, and Gabon, financial literacy empowers women and other excluded groups and facilitates their access to formal services and economic engagement (Frisancho, 2023). It increases access to services and financial management in nations like Botswana, Kenya, Uganda, and Rwanda, resulting in increased economic independence and better living standards (OECD, 2022a). In Nigeria, Ghana, and Botswana, financial literacy among women and youth opens doors to loan availability, savings, and investments in business and education, all of which contribute to social mobility and economic opportunity. Financial literacy improves general well-being by assisting people in Namibia, South Africa, and Zimbabwe in overcoming obstacles and creating a safe financial future through wise choices about retirement planning, savings, and investments (OECD, 2022b).

Financial Literacy Theory of Financial Inclusion enable people to speak up for their rights and hold financial institutions responsible in Algeria, Angola, Libya, Namibia, Togo, Gabon, and other countries, particularly in these difficult economic times. Equitable citizens have the power to influence their communities' economy and financial institutions by effectively interacting with them and demanding fair treatment (OECD, 2020c; Fornero & Prete, 2023). As a result of improved citizen understanding of their roles and obligations, increased financial literacy leads to more transparency and accountability within the financial system. Knowledgeable people have the power to demand equitable treatment from financial service providers, building confidence and promoting civic

engagement. Understanding finance promotes ethical money management and rights advocacy, which increases financial inclusion and empowers people all around (OECD, 2020b).

Financial literacy encourages people in Angola, and other volatile countries learn how to handle their money by creating a budget, saving money, and varying their sources of income. Farmers in nations like Botswana and Kenya increase their readiness for risks like crop failures and weather catastrophes by building savings accounts, purchasing insurance, and learning about investments because their economies rely heavily on agriculture (OECD. 2020a; Klapper & Lusardi, 2020). People in resource-rich Cameroon and Chad accumulate emergency cash, make investments in reliable assets, and use insurance to reduce their exposure to shocks from the outside world. Ghana and Nigeria being an undeveloped economy, financial literacy enables people to handle erratic income, put money aside for emergencies, and make wise financial decisions (Kaiser et al., 2022).

Financial literacy theory of financial inclusion enhanced awareness helps citizens to engage in formal systems like banking and credit access, addressing underserved groups in countries like Angola, Libya, Namibia, Togo, Gabon, and so on. Financial literacy is necessary for the efficient use of digital services and mobile banking in Botswana, Kenya, Uganda, Rwanda, and other countries (Hasler et al., 2023). These services promote financial inclusion and development. In order to make educated decisions and increase the reach of resources in Cameroon, Chad, Lesotho, and Gabon, there is a need for financial literacy instruction due to limited access. Empowering underprivileged populations, such as women and rural communities, with financial knowledge fosters inclusion and lessens reliance on informal practices in countries like Nigeria, Ghana, Botswana, and others. While in Namibia, South Africa, Zimbabwe, and other parts of Southern Africa, literacy unlocks access to official services and promotes economic growth by assisting people in overcoming obstacles like exorbitant costs and inadequate infrastructure (Gerrans et al., 2023).

3.2.1.2 Weaknesses of Financial Literacy Theory of Financial Inclusion

The financial literacy initiatives are designed to promote willingness; hence, economic disparities and limited access to resources have reduced the capacity of North African countries such as Algeria to fully participate in the initiative. Despite the goal and objectives of financial literacy initiatives, East Africa, like Botswana, among others, lacks income or assets needed for formal banking services (Farah, Purwanto, & Viana, 2023). The motive of financial literacy is to drive willingness to utilize formal finance in Sub-Saharan countries; hence, poverty, poor and weak infrastructure, and the unemployment rate limit participation. The motives of financial knowledge are unable to convince people living within these African countries, as the structural barriers to accessing banking services are discouraging. Similarly, people in Central Africa, such as Cameroon, with limited formal service access show willingness given the opportunity. However, low income, lack of collateral, and infrastructure pose significant challenges.

For effective inclusion of these initiatives, all these barriers need urgent attention. Across diverse regions like West Africa, Nigeria, among others, and Southern Africa, Namibia, and others, financial literacy initiatives spark a willingness to use formal finance. However, barriers like poverty, unequal income, and limited infrastructure constrain actual participation. The current design of financial knowledge could not overcome these capacity issues, limiting access to credit, savings, and banking services. Although financial literacy is important, larger socioeconomic issues may restrict its impact (Rangasamy, Mathew, & Francline, 2019).

Despite literacy programs throughout North African countries, such as Algeria, among others, obstacles such as income inequality and restricted access to financial institutions persist. Even with financial knowledge, regulatory obstacles and limited infrastructure further impede full participation. Mobile banking provides access throughout East Africa, Botswana, and Central Africa, Cameroon; nonetheless, obstacles to financial inclusion remain. While financial knowledge aids in decision-making, poverty and restricted credit availability erect obstacles in East Africa. Although there is a willingness to use formal institutions in Central Africa, participation is hampered by a lack of basic services,

regulatory obstacles, and inadequate infrastructure (Prasetyo, Yulianto, & Setyadharma, 2020).

Financial literacy is becoming more popular in a variety of contexts, including West Africa countries, such as Nigeria, among others, and Southern Africa, Namibia, although inclusion depends on addressing economic inequality and increasing service accessibility. Notwithstanding literacy campaigns, people encounter obstacles due to inadequate banking infrastructure and policies, especially when trying to obtain credit and savings (Nguyen et al., 2017). Financial literacy plays a critical role in empowering individuals, but structural obstacles such as poverty and inadequate infrastructure impede their complete engagement in formal systems.

There are challenges in putting financial literacy programs into action in areas with limited access and resources. Reaching vulnerable populations in North African countries, such as Algeria, among other countries, is challenging due to uneven access to financial and educational assistance. Due to data restrictions, impact evaluation necessitates creative solutions. Reaching isolated and marginalized people in rural East Africa countries, such as Botswana, among other countries, is difficult; program efficacy is hampered by resource scarcity; and comprehensive data collection and long-term study are necessary to assess effects (Farah et al., 2023).

There are unique obstacles to establishing financial literacy in a variety of circumstances. In Central Africa, such as Cameroon, there is poverty, poor infrastructure, and linguistic and cultural diversity. Specialized techniques are required because of certain difficulties. The differences in education and service access, as well as the cultural and linguistic variety throughout West Africa countries, such as Nigeria, among other countries. Engagement of stakeholders, including financial institutions (Klapper & Lusardi, 2020), NGOs, and governments, is essential. Agreements on cooperation and data sharing are necessary for thorough evaluation. There are insufficient educational resources and socioeconomic inequality in Southern Africa countries, such as Namibia, among other countries. Utilize technology (workshops, Smartphone apps) to expand your audience and Evaluation and monitoring are essential for improving programs. Although the idea acknowledges that certain populations have low financial literacy, it may ignore

intersectional issues. In North African countries, such as Algeria, women face additional obstacles due to gender differences in education and opportunities, particularly those with lower incomes and educational attainment. Programs for financial literacy must target these interconnections in order to increase women's access to formal institutions and financial services (Prabhakar, 2019).

Financial literacy has intersecting issues in East Africa countries in Botswana, among other countries, and Central Africa countries, Cameroon, among other countries. Low-income women are disproportionately affected by poverty and inadequate education, necessitating customized solutions. Barriers for marginalized groups, such as women and low-income, poorly educated people, are made worse by socioeconomic inequality. Focused initiatives are essential for financial inclusion (Tucker et al., 2019).

In West African countries, such as Nigeria, among other countries, women and underprivileged communities face obstacles due to cultural and economic disparities, gender, income, and education. For meaningful inclusion while in Southern Africa countries, such as South Africa, among other countries, tailored initiatives are essential: Barriers that already existed for women, people with poor incomes, and people with little education are made worse by historical injustices. In-depth plans are required to meet their requirements and encourage economic empowerment (Mabula & Dongping, 2019).

3.2.2 Public Good Theory of Financial Inclusion

This theory highlighted that financial inclusion is a responsibility which the government owes its citizens, which is also expected by the citizens from the government to deliver formal financial services to them (Ozili, 2020b). The theory contends that the government must deliver formal financial services to all its citizens via public institutions. Public service theory is similar to the public goods theory, which emphasizes that financial service must be delivered by the government to all its citizens (Oakland, 1987 cited in Ozili, 2020b).

Furthermore, Ozili (2020b) ascribed three advantages to good public theory of financial inclusion; primarily, the theory pinpoint government as being responsible for delivering financial services to its citizen; also, the theory advocated that the whole system of resources is controlled by the government including financial system and socioeconomic structure. Moreover, public confidence is enhanced. Public Good Theory of Financial

Inclusion states that government funding from tax collections should be the main source of funding for financial inclusion programs. The pattern of rising public funding relative to private contributions lends support to this (Dashie et al, 2013). More consistent and long-term support for programs, particularly for larger efforts, can be provided by government resources. Increased accessibility could benefit marginalized communities that might not be included in programs spearheaded by the commercial sector (Yuniningsih, Hasna, Wajdi, & Widodo, 2018).

Investing in financial inclusion for societal benefits like poverty reduction and economic prosperity can be viewed as a public duty for the greater good. Expediency can be limited by circumstances, government bureaucracy, and the possibility of misallocating funds. The following are highlights of the advantages of the financial inclusion theory of public money which includes the possibility of the government taxing the rich to engender resources for programs of financial inclusion for the benefit of all (Yuniningsih et al., 2018). Thus, resulting in income redistribution and reduction in income inequality for the poorer segment of the population's benefit. In addition, the cost associated with or accruing from raising public funds for the purpose of funding financial inclusion programs is negligible or low. Moreover, using public money to fund financial inclusion programs for the people can stop self-seeking, egocentric individuals from taking over the financial inclusion program for their selfish benefit.

According to Widjaja, Arifin, and Setini (2020), there are shortcomings associated with Public Money Theory of financial inclusion, and they are as follows, dearth of proper planning is a major problem associated with public funding. Dearth of organization or workable plan can bring about recklessness in spending on financial inclusion programs which can eventually result in ineffectiveness. Furthermore, unnecessary delays in reaching the excluded population may result from expending public money to fund financial inclusion programs, such as delays caused by lobbying, delays in funds disbursement, and delays due to political events (Siboro & Rochmawati, 2021). Governments often battle with inadequate funds and are forced to seek debt for the funding of programs of financial inclusion, which may increase the government debt burden. When the responsibility of achieving financial inclusion is assigned to an

incapable organization, it may result in improper delegation of authority. Usually, instead of the government creating a new agency, they habitually make one of their competent agencies responsible for the realization of its financial inclusion objectives. Often, the appointed agency may be overworked with the extra duty of promoting financial inclusion because, they already have their own statutory duties, and (Onibala & Manurun, 2017).

3.2.2.1 Strengths of Public Good Theory of Financial Inclusion

Governments in countries like Botswana and Kenya have established policies and regulations aimed at increasing financial inclusion, emphasizing their responsibility to ensure access to formal financial services for all citizens (Marwati, 2018). Countries like Cameroon and Gabon have also recognized the importance of government responsibility in providing financial services, leading to the implementation of financial inclusion programs and policies. Ghana and Nigeria have demonstrated their commitment to government responsibility by implementing initiatives to promote financial inclusion, such as the Ghana Shared Growth and Development Agenda and Nigeria's National Financial Inclusion Strategy (HS & Lestari, 2022). Governments in countries like South Africa and Zimbabwe have implemented policies and programs to ensure that formal financial services are accessible to all citizens, emphasizing their responsibility to promote financial inclusion.

Governments in Angola and Gabon have advocated for the delivery of financial services through public institutions, allowing for greater control and oversight to ensure equitable access and distribution. Countries like Uganda and Rwanda have implemented government-led initiatives to deliver financial services (Haryono & Oktafiani, 2019), enabling greater control and oversight over the financial system to promote stability and reliability. Governments in Chad and Lesotho have taken steps to deliver financial services through public institutions, enhancing control and oversight to foster trust and confidence in the financial system. In countries like Botswana and Kenya, where financial services are provided by the government, public confidence in the reliability and stability of these services is enhanced, leading to increased trust and participation in the financial sector (Haryono & Oktafiani, 2019).

Efforts in Gabon and Cameroon to deliver financial services through public institutions can enhance public confidence in the reliability and stability of financial services, promoting trust and participation in the financial system. Botswana and Nigeria have established policies and regulations to promote government delivery of financial services, ensuring greater control and oversight to enhance public confidence in the financial sector. Governments in Namibia and South Africa have emphasized government control and oversight in delivering financial services, aiming to enhance the reliability and stability of the financial system to build public confidence. Initiatives in Libya and Togo that provide financial services through the government can enhance public confidence in the reliability and stability of these services, fostering trust and participation in the financial system (Garcia-Alonso et al., 2021).

Ghana and Nigeria have implemented initiatives to provide financial services through public institutions, enhancing public confidence in the reliability and stability of these services, thereby fostering trust and participation in the financial sector. Initiatives in Zimbabwe and South Africa aimed at providing financial services through government channels can enhance public confidence in the reliability and stability of financial services, leading to increased trust and participation in the financial system (Yuniningsih et al., 2018).

3.2.2.2 Weaknesses of Public Good Theory of Financial Inclusion

Countries like Angola and Namibia may face challenges in funding comprehensive financial inclusion programs due to competing priorities and limited resources, potentially leading to difficulties in adequately addressing financial inclusion needs. Governments in Uganda and Botswana may struggle with limited financial capacity to fund extensive financial inclusion programs, which could result in challenges in effectively addressing the diverse needs of underserved populations. Countries like Algeria and Gabon may experience inefficiencies and misallocation of resources in financial inclusion efforts due to inadequate planning and oversight, undermining the effectiveness of such initiatives (Ozili, 2020b).

Countries like Chad and Lesotho may find it challenging to allocate sufficient resources to financial inclusion efforts due to competing priorities, potentially leading to difficulties

in adequately addressing the financial needs of marginalized communities. Nigeria and Ghana might face constraints in funding comprehensive financial inclusion programs, risking overburdening the governments with limited resources and competing priorities, thereby hindering effective financial inclusion initiatives. Zimbabwe and Namibia may struggle with limited financial capacity to fund extensive financial inclusion programs, potentially leading to challenges in addressing the diverse needs of underserved populations (Prabhakar, 2019).

Kenya and Rwanda might face challenges in financial inclusion due to inadequate planning and oversight, leading to inefficiencies and potential misallocation of resources in addressing the financial needs of marginalized communities. Gabon and Cameroon may struggle with inadequate planning and oversight in financial inclusion efforts, resulting in inefficiencies and suboptimal outcomes in addressing the financial needs of underserved populations. Countries like Nigeria and Botswana may experience challenges in financial inclusion due to insufficient planning and oversight, leading to inefficiencies and potential misallocation of resources (Christanto, 2022).

South Africa and Zimbabwe might face difficulties in financial inclusion efforts due to inadequate planning and oversight, resulting in inefficiencies and potential misallocation of resources. Governments in Namibia and Angola may struggle with inadequate delegation of authority in financial inclusion efforts, as existing government agencies may prioritize their existing mandates over financial inclusion objectives (Choiriyah & Purwanto, 2022).

Uganda and Rwanda might face challenges in delegating authority effectively in financial inclusion efforts, potentially leading to suboptimal outcomes as government agencies may lack sufficient capacity or expertise. Chad and Lesotho may experience difficulties in delegating authority effectively in financial inclusion efforts, as existing government agencies may prioritize other mandates over financial inclusion objectives. Countries like Ghana and Nigeria may struggle with inadequate delegation of authority in financial inclusion efforts, leading to suboptimal outcomes as government agencies may lack the capacity or expertise to effectively address financial inclusion needs. South Africa and Namibia might face challenges in delegating authority effectively in financial inclusion

efforts, potentially resulting in suboptimal outcomes as government agencies may prioritize other mandates over financial inclusion objectives.

3.2.3 Systems Theory (ST) of Financial Inclusion

This theory was propounded by Ozili (2020b), stating that the outcomes of financial inclusion are realized through the sub-systems that are already in place (whether financial, social or economic systems) upon which financial inclusion rests, and resulting in greater positive benefits for the systems' financial inclusion relies on. According to Morgan, Huang, and Trinh (2019), a major shift in a sub-system (one aspect of the system) can have a big impact on the expected results of financial inclusion. For example, enforcing regulations on economic agents and financial service providers who are a part of the economic and financial system can force them to align their interests with those of the people who use basic financial services. This can force them to provide users with affordable and high-quality financial services within specific guidelines that shield them from price discrimination and exploitation.

However, a substantial shift at the systemic level, like swapping out the current national financial inclusion plan with a brand-new one, does not always result in a sub-system, it has to be done at the sub-system level. The theory recommends that the operations of the sub-systems will better the financial inclusion system it relies on and the success or failure of a financial inclusion agenda will depend upon the effectiveness and efficiency of the sub-systems. But ultimately, the readily available sub-systems (economic, social and financial) in a country are the ultimate beneficiaries of financial inclusion under the systems theory perspective. There are merits to systems theory of financial inclusion. It appreciates the role of existing economic, financial and social structures or systems in a country thereby promoting financial inclusion. Secondly, it provides a macro perspective on financial inclusion compared to other theories with a micro-perspective.

The Systems Theory (ST) of financial inclusion examines how the interrelationships between the subsystems that support financial inclusion impact its results. However, there are certain drawbacks to the systems theory. First, the environment is reflected in the current systems. In certain settings, the current systems might not work well, which could lead to failure to attain the desired results for financial inclusion. Second, the systems

theory of financial inclusion focuses on how the system and its subsystems affect financial inclusion outcomes rather than acknowledging the impact of external factors that may have an impact. Thirdly, the Systems Theory (ST) of financial inclusion makes the assumption that the systems on which financial inclusion is based, and its results are directly related.

3.2.4 Special Agent Theory (SAT) of Financial Inclusion

The special agent theory of financial inclusion contends that rather than the government providing formal financial services as public goods, special agents should provide them to the excluded population (Ozili, 2020). Because, providing formal financial services to people without bank accounts can frequently be challenging due to the characteristics of distant towns, their residents, or their geographic location. In order to provide official financial services to people of marginalized populations, it is necessary to hire specialist agents. This notion states that the special agent should possess high-quality abilities and additional knowledge about the target population and banking and finance.

Garg and Singh (2018) submitted that the special agent is regarded as knowledgeable, highly skilled, and superior in their ability to bring the excluded people into the formal financial sector so they can access formal financial services. According to this view, many national and international governmental levels have an agent-principal relationship. Financial institutions and IT firms may be examples of special agents. The agency theory served as the foundation for this theory at first (Eisenhardt, 1989 referenced in Grohmann, 2018).

Giving the special agent theory of financial inclusion, specialized agents are required to provide financial inclusion to members of excluded communities because complex issues and technicalities pertain to the community's nature, its members, or its geography may make it difficult to provide financial inclusion to the excluded population (Nimbrayan, Tanwar, & Tripathi, 2018). Based on this theory, the special agent should be: (i) highly qualified and specialized; (ii) aware of the unique characteristics of the excluded population; (iii) knowledgeable about the informal financial system that exists in the communities where the excluded members of the population live; (iv) able to identify areas for innovation and improvement; and (v) able to come up with a way to integrate

the local financial system into the institutional financial sector. The excluded population can now access formal financial products and services because the special agent is regarded as knowledgeable, highly skilled, and superior in bringing them into the formal financial sector. According to this view, the principal and the agent have a unique relationship (Lichtenstein, 2018).

While the special agent is frequently a local bank, non-bank institution, or other unique entities established with the express intent of attaining financial inclusion, the principal is frequently the national government, a foreign government, or foreign organizations. Technologies like financial technology (Fintech) firms and financial institutions can also act as special agents. There are certain advantages to the special agent hypothesis of financial inclusion (Gabor & Brooks, 2017). First, it promotes financial inclusion in the nation by using the services of specialist agents. The government will be able to concentrate on other crucial and urgent national concerns by using the services of professional agents to advance financial inclusion in the nation. Second, there is a great deal of trust in special agents' capacity to provide financial.

In order to achieve the shared objective of wider financial inclusion, the special agents are made up of knowledgeable people and professionals who are either connected to or working in conjunction with other specialized organizations. Third, the special agent's salary is pre-agreed, and there is no doubt regarding the financial inclusion goals to be met. There is no uncertainty since the special agent is aware of the goal, the expectations, and their commitment to achieving it. They are also aware of the remuneration they will earn for their efforts (Kazeem, 2021). Lastly, since the special agent works with people rather than money, the basic principal-agent issues in agency theory have no bearing on the special agent relationship! According to agency theory, the principal-agent dilemma arises when a manager of a company acts in their own self-interest and appropriates extra financial resources (money) to themselves at the expense of shareholders (for more information on agency theory, see Jensen and Meckling, 1976, quoted in McCrocklin, 2019).

There are certain drawbacks to the special agent idea of financial inclusion. First, if the government is the principal, it may designate its own agency as the special agent, so

acting as both the principle and the agent. The special agency's goal of advancing financial inclusion would be undermined by this (Okafor, 2022). Meanwhile, Oturu, Obiagio Ebiseni, (2022) argued that since the government agencies are inevitably beset by inefficiencies in the public sector, therefore, it is pertinent that the government should not be both the principal and the special agent at the same time. Second, a private special agent will leave the financial inclusion project if there is a violation of the terms of the contract or the conditions of employment, which could be brought on by the government not paying the special agent enough or by the government failing to supply the fixed resources for the financing of financial inclusion projects as documented in the policy document.

3.2.4.1 Strengths of Special Agent Theory (SAT) of Financial Inclusion

According to the study of Ozili (2020), SAT can address the unique challenges faced by remote or marginalized communities in North Africa, such as those in rural areas or informal settlements. Special agents with local expertise can tailor financial services to meet the specific needs and contexts of these communities, potentially improving financial inclusion rates. In East Africa, SAT can be particularly effective in reaching populations in geographically isolated areas, such as rural villages or remote islands. Special agents with knowledge of local languages and customs can bridge the gap between formal financial institutions and underserved communities, promoting greater access to financial services (Ajifowoke, 2021).

Central Africa faces challenges related to infrastructure and connectivity, which can hinder access to financial services for many residents. SAT can help overcome these barriers by deploying specialized agents who understand the local context and can leverage innovative solutions, such as mobile banking or agent networks, to expand financial inclusion. West Africa has diverse populations and varying levels of financial access across different regions (Adesanya, 2017; Buchi, 2022). SAT can play a crucial role in targeting excluded populations, such as those in remote rural areas or urban slums, by deploying specialized agents who can provide tailored financial services and overcome barriers to inclusion. In Southern Africa, SAT can address challenges related to economic inequality and geographic disparities in access to financial services. Special agents can

focus on reaching marginalized populations, such as women, youth, or rural residents, and can collaborate with local organizations and community leaders to promote greater financial inclusion (David, Tyagher, Jacob, & Tordue, 2022).

3.2.4.2 Weaknesses of Special Agent Theory (SAT) of Financial Inclusion

In West African countries where governments may have strong control over financial institutions, there's a risk that government-appointed agencies as special agents could prioritize government interests over genuine financial inclusion. This could lead to inefficiencies and hinder progress. Reliance solely on special agents might limit direct government involvement and oversight in financial inclusion efforts, potentially reducing accountability and the effectiveness of service delivery, particularly in remote or marginalized areas (Emuveyan & Ekwunife, 2021).

In East African countries with diverse economic landscapes like Kenya and Botswana, reliance on private special agents could lead to project disruptions if these agents withdraw due to breaches in contractual terms or insufficient compensation (Emuveyan & Ekwunife, 2021). This could especially impact rural areas where financial inclusion efforts are critical. East African countries, despite being frontrunners in financial innovation, may face challenges in identifying and selecting qualified special agents with the necessary expertise and commitment, particularly in regions with limited institutional capacity (Eyinade, 2022).

Central African nations may experience limited government involvement and oversight if financial inclusion efforts heavily rely on special agents. This could hinder the effectiveness of service delivery, particularly in remote or underserved regions where government intervention is essential (Eyinade, 2022). In West African countries with significant government influence in financial sectors like Nigeria and Ghana, relying on government-appointed agencies as special agents could lead to conflicts of interest. This might result in inefficiencies and prioritize government agendas over genuine financial inclusion objectives.

Southern African countries may face the risk of private special agents withdrawing from financial inclusion projects due to breaches in contractual terms or insufficient compensation. This could disrupt progress, particularly in rural or economically

disadvantaged areas where financial inclusion efforts are crucial. SAT may not effectively address systemic issues underlying financial exclusion in Southern African countries such as structural inequalities or regulatory barriers, which require broader policy interventions beyond specialized service delivery (Farah, Purwanto, & Viana, 2023).

3.3 Empirical Literature Review

In this section, the empirical literature review highlights several key determinants of financial inclusion in many countries, including economic growth and financial inclusion in sub-Saharan African countries, the level of financial development and financial inclusion, income level and financial inclusion, and financial education and financial inclusion

3.3.1 Empirical Review on Economic Growth and Financial Inclusion

In recent years, there economic growth and financial inclusion in sub-Saharan has been a shift in policy focus from financial development to financial inclusion (Kaur & Kapuria, 2020). However, there is limited literature on the role of financial inclusion in developing economies (Masiyandima et al., 2017). The determinants of financial inclusion on economic growth remains uncertain due to contrasting results found in the literature (Gebrehiwot & Makina, 2019). Some studies suggest a positive effect, particularly when financial inclusion is combined with other factors such as mobile penetration and gender dimension (Mhlanga, 2020a; Iheanachor, Ozegbe, 2020; Inegbedion, Akande, Olalekan, Adeyemo, & Adedugba, 2022). Various methodologies have been used to demonstrate the positive effect, including GMM, ARDL, VAR regression, and OLS (Riley, 2019; Prymostk et al., 2020; Dar & Ahmed, 2020; Cámara & Tuesta, 2018).

Cross-sectional and panel studies support the positive determinants of financial inclusion on economic growth (Louis & Chartier, 2017; Mhlanga, 2020b; Wang & Guan, 2017; Yangdol & Sarma, 2019). These studies show that financial inclusion plays a vital role in enhancing the growth rate of economies. Additionally, individual country-level studies using various indicators, such as commercial bank branches, credit, and ATMs, confirm the positive relation between financial inclusion and economic growth (Sharma et al., 2020; Babajide et al., 2015; Lenka & Sharma, 2017).

Overall, the accessibility of financial services and products, particularly to underserved populations, is crucial for realizing the positive effects of financial inclusion on economic growth (Demirgüç-Kunt et al., 2015; Hailu & Yatoo, 2021; Angadi, 2023). Governments have recognized the importance of financial inclusion and set targets to improve access to financial services (Alliance for Financial Inclusion, 2021). While more study is needed, the existing literature suggests that financial inclusion can be an engine for economic growth (Shipalana, 2019).

3.3.2 Empirical review on Financial Development and Financial Inclusion

The findings from various studies highlight the importance of both financial literacy and digital literacy in promoting inclusiveness and financial resilience. Kass-Hanna et al. (2021) emphasizes that both forms of literacy play crucial roles in building financial resilience and inclusiveness. Financially literate individuals exhibit better retirement planning, decision-making, and are less likely to engage in risky behaviors such as gambling (Motonishi et al., 2021). The combination of financial inclusion, online banking, and financial literacy contributes to economic development by providing access to essential financial services like savings, loans, insurance, and credit, which can help individuals escape poverty (Tinghög et al., 2021).

Financial literacy also encourages the adoption of electronic payment methods, mobile phone payments, and remittances (Mahmood, 2022). However, Van et al. (2019) caution that increasing access to digital financial services through digital literacy alone, without adequate financial literacy, can be risky. Moreover, studies indicate a link between cognitive and emotional intelligence and financial behavior (Rey-Ares et al., 2021; Rastogi, 2018). These factors influence how individuals make financial decisions and manage their finances. A bibliometric analysis conducted on the Scopus database, focusing on the key phrase "financial literacy," revealed that a total of 2,908 English-language articles were published between 1992 and 2023. The analysis indicated a gradual increase in the number of published articles related to financial literacy since 2007 (citation of Van et al., 2019).

3.3.3 Empirical Review on Income Level and Financial Inclusion

The empirical study on the determinants of financial inclusion on reducing income inequality has produced mixed results. Several recent studies have examined different dimensions of financial inclusion and its relationship with income inequality. Kling et al. (2020), using Chinese data from 2011 and 2013, find that income inequality worsens when households rely on formal or informal loans, but access to bank accounts improves households' future income distribution. Park and Mercado (2018) explore the impact of the "accessibility," "availability," and "use" of financial services on income inequality. They measure these dimensions by factors such as the number of ATMs and commercial bank branches per 100,000 adults, the number of borrowers and depositors with commercial banks per 1000 adults, and the domestic credit-to-GDP ratio. Their findings suggest that increasing accessibility, availability, and use of financial services reduces income inequality.

Aslan et al. (2017) find that increasing the intensity of financial service utilization by a larger population leads to a reduction in income inequality. However, Sukmana and Ibrahim (2018) reach a different conclusion in their study of 73 developing countries using OLS regression methods. They find that access to financial services does not serve as a factor that attenuates inequalities in income, except when income inequalities are low in a country. Demir et al. (2020) analyze the determinants of financial inclusion on income inequality using a panel of 140 countries and considering the interaction between FinTech and financial inclusion. Through quantile regression, they find that financial inclusion is a crucial channel through which FinTech reduces income inequality. However, they note that the effects are mainly associated with higher-income countries. Similarly, Omar and Inaba (2020) and Park and Mercado (2015) find that financial inclusion significantly reduces poverty rates and income inequality in developing and Asian countries, respectively. On the other hand, Zia and Prasetyo (2018) study 33 Indonesian provinces over the period 2014-2016 and find that while financial inclusion reduces poverty, it does not have a significant impact on income inequality.

Ouechtati (2022) examines how financial inclusion affects income inequality by investigating the influence of economic and political institutions in moderating this

relationship. The study utilizes data from 110 countries over the period of 2014-2018. The empirical findings indicate that the development of effective institutions can enhance financial access, while poor institutional quality can weaken the determinants of financial inclusion. In a study by Quoc et al. (2019) on 22 transition economies, the ordinary double least squares method and other econometric estimation techniques are employed to analyze panel data. The results demonstrate that the financial inclusion index contributes to a reduction in income inequality. Turégano and Herrero (2018) conduct a comparative study on the determinants of financial deepening and financial inclusion on income inequality. Using the ordinary double least squares method, they analyze an unbalanced panel dataset comprising approximately 75 countries over the period of 2000-2011 (Hasler et al., 2023). The study reveals that the composite index of financial inclusion leads to a decrease in income inequality, whereas financial deepening does not have a significant impact on inequality.

3.3.3 Empirical Review on Financial Education and Financial Inclusion

According to the literature, education has a significant impact on financial inclusion in three primary ways. Firstly, students who perform poorly in quantitative subjects, such as mathematics, may lack the necessary skills in these areas and other related academic fields, increasing their risk of financial exclusion in the future. Secondly, underperforming in school directly affects future employment and income prospects, which often leads to a higher likelihood of long-term financial exclusion (Farah, et al 2023). However, financial education not only focuses on acquiring skills and knowledge but also emphasizes understanding various financial products and services. While it is possible to acquire these skills without completing advanced mathematics courses, literacy is also crucial for financial education, as the language of finance can be complex and filled with jargon (Sukmana, 2018).

Education plays a pivotal role in determining access to and utilization of formal financial services. For instance, Ouechtati (2022) examined the influence of education and other socioeconomic characteristics on financial access in Ghana. Their findings indicated that education, income, and wealth were significant determinants of financial access. Individuals with higher education levels were more likely to use private banks rather than

public sector banks or other public payment outlets like banking agents. Additionally, the percentage of the population with bank accounts varied based on educational attainment (Klapper & Lusardi, 2020).

Similarly, in a study conducted in Kenya, Ngono (2020) found that education influenced the extent of financial product usage. Individuals with a formal education were more likely to utilize financial services compared to those without education. The study also highlighted the role of location, with urban areas exhibiting higher usage of financial services compared to rural areas. This suggests that the availability of financial services may be influenced by geographical factors.

In a related study focused on South Africa, Mishi, Vacu, and Chipote (2012) examined the relationship between literacy levels and access to banks in the Eastern Cape Province. The study distributed survey questionnaires to three local municipalities: Peddie, Willow Vale (Idutywa), and Cholumna. These areas had been targeted by various financial literacy programs, particularly for youth, women, and school children. The study's objective was to assess the impact of literacy levels on bank access. The findings indicated a significant and positive correlation between literacy levels and individual access to banking services, with literacy measured by the ability to read English (Triki & Faye, 2013).

In a separate study, Oseifuah and Gyekye (2014); Mabula and Dongping, (2019) examine the relationship between financial literacy, demographic factors, and other socioeconomic characteristics among undergraduate students. The study also explored how financial knowledge among students correlated with their attitudes and behaviours towards personal finance issues. The study measured financial literacy and revealed surprisingly low levels of financial knowledge among accounting students at the University of Venda, with only 38 percent of participants considered financially literate. However, the study found that students who took money management courses were more likely to exhibit financial literacy.

3.4 Assessment of literature

Most scholar studies have shown that there is an improvement in the level of financial literacy, Literature also confirms the enhancement in the level of financial autonomy as

well. From the literature review, the assessment of financial literacy shows that financial education has a positive effect on financial knowledge and financial behaviour, but it does not necessarily imply a positive effect on the degree of financial inclusion. The overall findings from the prior literature reveal positive effects on one hand and a lack of or rather small effects on the other. The outcome and impacts of financial education learnt depend on factors such as the manner in which it is delivered, the content of the message being disseminated, and the population is targeted. Although financial education may increase financial access, it is important to use it hand in hand with the other approaches aiming at the removal of the supply-side and demand-side constraints.

The income level also correlates well positively with FI as indicated in several studies. The economically well-off can afford financial services more than the economically less well-off as they are more financially literate and more conversant with formal finance. On the other hand, on the demand side, the financially less well-off clients may not have collateral, the cost of transactions may be high, or they might not have easy access to any player in financial services. This occurs through the exclusion of lower-income people from formal sources of credit since returns on lending is reaped mainly by the relatively well-off in society. Focusing on overcoming income divide and using strategies for effective density targeting mostly the low-income client groups is essential for the promotion of inclusive financial systems.

Financial and stock market development also have a significant and positive correlation with financial access. Where there is financial development, for example through size and diversification of the financial sector, it paves way for access and usage of financial services hence improving development outcomes. But financial development in the context of financial structures and systems does not necessarily mean facilitating financial inclusion. Selective measures and efforts are required to guarantee that financial innovations and growth of access to the financial resources are to be provided for different groups of the population, particularly the unbanked. Structural constraints on the demand side as well as on the supply side must be resolved for a more effective financialization process. Scholars study the link between financial and economic development and find it dynamic. There are theoretical ways through which financial inclusion enhances

economic growth; more efficient provision of resources, investment promotion and balancing of consumption.

The financially included individuals and firms are in a vantage position to harness opportunities, mitigate risks and wealth creation. But dependency also works in the other way round, meaning economic growth is one of the ways of achieving financial inclusion since people's incomes rise, poverty decreases, and the financial sector advances. Hence two hypotheses on the effect of financial inclusion on growth will emerge; we might also have those targeting specific financial services and/or section of the population. As for credit as a source of funds, credit seems to have a slightly better impact on growth than saving. Hence, the positive consequences of financial inclusion could be thought of as being more abundant in developing economies that are characterized by high levels of financial exclusion. Microfinance is, therefore, a useful approach when it comes to encouraging the financial inclusion needed for sustainable economic growth. But it is a two-way process because growth in the economy can also lead to financial inclusion because it leads to increased earning capacity, poverty reduction and advancement of the processes that lead to financial deepening. A study using DEA and OLS reveals that the effect of financial inclusion on growth may vary with specific financial services as well as targeted population. Credit may be even more important for growth than savings. The gains accruing from financial liberalization may be especially felt in developing economies with high levels of financial exclusion. It is possible to include financial inclusion in the concept of the strategies that can support the development of sustainable and inclusive economy.

3.5 Conclusion

The extant study on financial inclusion and economic growth, thus, reveals a significant correlation, but the strength and processes differ concerning studies and environments. According to a study, there is evidence that enhancing access to credit also enhances economic growth, and this is even the case being supported by the influence of more factors like percentage of post and in telecommunications that is represented by the density of mobile phone, gender program among others.

Hence, although financial literacy and digital skills are relevant when it comes to the subject of financial inclusion and preparedness, the topic of how financial inclusion affects the levels of inequality is less clear. While some analyses claim that it can help in decreasing income differences, others show that the outcome is contingent. All this means that to ensure financial inclusion and use it as the driver for economic development, a complex of measures is required. This entails enhancing consumers' and households' financial access, enhancing consumers' and households' education and training in matters to do with money and digital technology, and dealing with the issue of poor or inadequate income. Given that the emphasis on the financial inclusion policy is growing, more studies should be done to explore the dynamics of the complex links between inclusion, growth, and inequality on the example of various developing economy countries.

CHAPTER FOUR

RESEARCH METHODOLOGY

4.1 Introduction

This chapter covers the research methodology which is the practical of how this study is done systematically to ensure that all data or information used in this study to address the determinants of financial inclusion in Sub-Saharan Countries (Angola, Kenya, Cameroon, South Africa, Rwanda, Namibia, Togo, Gabon, Zimbabwe, Lesotho, Botswana, Benin, Ghana, Ethiopia, Nigeria) are valid and reliable to solve the identified research problem, thereby satisfying the research objectives of this study (Jansen & Warren, 2020). The model specification is informed by the preceding section on literature review and the desire to meet the earlier said objectives. The theories underpinning this study have been discussed, so are the key empirical works in this field that guided the model specification. Thus, this section consists of Research philosophy, Research design, Model specification, Definition and apriori expectations, Data Sources, Data Analysis, Estimation techniques, Diagnostics Checks, Ethical consideration and the Chapter Conclusion.

4.2 Research Philosophy

According to Saunders et al. (2019), research philosophy is the vision disclosed by the study about the financial inclusion in (Angola, Kenya, Cameroon, South Africa, Rwanda, Namibia, Togo, Gabon, Zimbabwe, Lesotho, Botswana, Benin, Ghana, Ethiopia, and Nigerian. The views regarding these selected Sub-Saharan Africa countries are the major concern in this study, as the countries determine the research strategy. Therefore, research philosophy reveals the ideas and knowledge contributed to this study. There are various types of research philosophy used by different studies: postmodernism, positivism, pragmatism, critical realism, and interpretivism (Saunders et al., 2019).

However, this study employed a positivism research philosophy, as it focused on the empirical data on financial inclusion considering access, usage, and quality in Angola, Kenya, Cameroon, South Africa, Rwanda, Namibia, Togo, Gabon, and Zimbabwe collated by the World Bank (2022). Positivism relates to the philosophical stance of the natural

scientist, which entails working with an observable social reality and the product can be law-like generalizations like those in the physical and natural sciences.

According to Cunliffe (2011) financial inclusion studies largely seeks to either identify factors that makes individuals or businesses to be excluded from formal financial system; or to examine whether inclusive growth can be stimulated by financial development – established on financial economics theories, upon which linkages between various socio-economic issues are examined. Cunliffe (2011) maintained further, that the study of financial inclusion is descriptive and intends to explain policy making issues with quantifiable, positive effect on society, and concluded that it is founded on ‘objectivism problematic.’ Thus, this research will be built on positivist’s philosophy which relates largely to the philosophical stance of the natural scientist and involves working with an observable social reality where the outcome can be law-like generalizations as it is in the physical and natural sciences. Although, financial inclusion is not scientific and cannot be subjected to practical experiment, but it still follows the positivist’s view that only knowledge acquired via observation based on measurable facts is reliable and acceptable. Nonetheless, positivism research philosophy still seems suitable for this study because it enables this study to understand the determinants of financial technological advancement, financial education, economic growth, level of employment, domestic credit to the private sector, and bank competition on financial literacy. Also, positivism research philosophy ensures that the results of this study are based on research objectives and are reliable and valid to be presented and analyzed through a qualitative approach and approved software. Also, positivism-maintained researcher’s role is objectively restricted to the collection of data and its interpretation in the research process, implying that a researcher is only an objective analyst personally distant from the values utilized in the study, with its research findings usually quantifiable and observable.

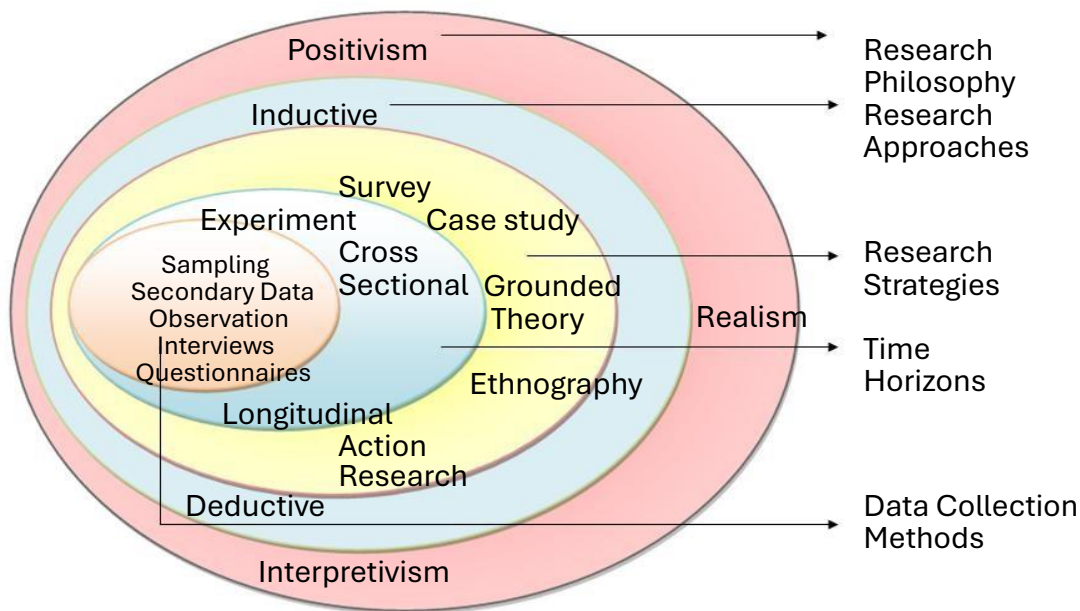
4.2.1 Research Approach

The study employed quantitative research design to reveal the determinants of financial inclusion in a number of sub-Saharan African countries. Consequently, Saunders et al.

(2019); Taylor and Medina (2011) state that quantitative research is the collection and analysis of number-based data on these relationships. This study thus aimed at assessing the extent to which fintech, financial education, economic growth, employment level, domestic credit, and bank competition were used as determinants of financial inclusion in Angola, Kenya, Cameroon, South Africa, Rwanda, Namibia, Togo, Gabon, Zimbabwe, Lesotho, Botswana, Benin, Ghana, Ethiopia, Nigeria.

According to Yin (2014), the research approach for this study was the quantitative method, and this was considered because it provided the opportunity to use data or measurable changes in other variables that enable direct comparison and analysis. This approach was based on the triangulation of secondary data from World Bank data, which were reliable sources for the data used in this study. In order to create preliminary results that were statistically valid and representative of the considered determinants of financial inclusion within the selected Sub-Saharan Africa countries. Also, Mishra and Alok (2011) submitted that this approach quantitative methods helped also to identify the tendency and correlation among variables. The quantitative side applied statistical tools to test theories on research problems and drew conclusions concerning how much each of these considered variables determined financial inclusion within the selected Sub-Saharan Africa countries. This approach was robust, quantifiable, and repeatable based on the positivist research philosophy adopted in this study (Jansen & Warren, 2020).

Figure 4.1: Research Process Onion



Source: Saunders, Lewis, and / (2009). Research methods for business students. Pearson education (5th Edition)

4.5 Selection of the Study Area

This study focused on Angola, Kenya, Cameroon, South Africa, Rwanda, Namibia, Togo, Gabon, Zimbabwe, Lesotho, Botswana, Benin, Ghana, Ethiopia, and Nigeria. These sub-Saharan countries were selected purposely because of their diverse economies, levels of financial inclusion, and distinct financial systems. Although, every country has specific features that are related to financial inclusion, especially the way people use these financial services.

Angola is evolving as a key financial hub in Central Africa, driven by a budding financial system that is seeing wide-spread adoption of digital banking and fintech more than ever. The nation has been vastly improved in its banking backbone since last decade, where financial stabilities ensured financial inclusion, tipped under the developments made by the individual banks working in these regions. This development has largely been driven by government-led efforts as well as private sector innovation aimed at enhancing financial inclusion.

Central Bank of Angola's Financial Inclusion Strategy was put in place by the government to help ensure that bank account usage is widespread among all portions of Angola's population, especially those in under banked rural areas and women who have been historically shut out from regular access to formal financial services. These have helped credit Angola with an impressive increase in the financial inclusion rate, millions of fresh bank accounts were opened recently. Besides, Angola is one of the fastest growing of expanding fintech sector with already several fintech startups and established financial institutions launching digital banking platforms as well as mobile payment solutions. This has increased the accessibility of banking services particularly to the younger and tech savvy segments. Digital wallets and mobile banking apps are CHARMs — used extensively for personal financial management, transactions at stores, as well as convenient ways to access credit or savings products.

The Angolan government has been an active investor in promoting cashless and encouraging debit cards, ATMs, and digital payment platforms. Live transactions have reduced, and increasingly more individuals are opting for e-payments than paying in cash; however, this is mostly a trend where individuals who are currently part of the digital economy are using whatever tech they can to get by live data transfers, bringing together the cash economy. With a critical role for financial technology to play, Angola is well placed to boost its already strong financial inclusion rates with digital enabling services that address a wider portion of the population.

Kenya is globally acclaimed for the landmark mobile money revolution that has literally restructured its financial landscape and set a global standard in demonstrating how technology can drive financial inclusion. It all started with the launch in 2007 of M-Pesa, a mobile payment system created by Safaricom that is now one of the world's leading forms of mobile money. While M-Pesa grants users the ability to send money, pay for a service, save, and borrow credit outside of a traditional bank, this innovation is especially powerful in rural regions or countries without universal high street banking.

As a result, M-Pesa has massively increased financial inclusion in the country, providing millions of people, especially in rural areas, access to formal financial services. Before

mobile money, millions of Kenyans, especially in rural areas, had little or no access to bank infrastructure. In Kenya, that gap was bridged by an easy-to-use, safe, and cheap system for moving money over mobile phones referred to as M-Pesa. As a result, the last mile people with no bank have now become part of the banking system to a large extent. Mobile banking has evolved beyond fundamental money transfers and now provides a variety of financial services from simple to convenient (savings accounts, microcredit, insurance) accessible on mobile phones.

This has allowed small business owners, farmers, and individuals in rural areas to not only stockpile their money securely but also access credit facilities and grow their economic activities. Kenya's financial inclusion efforts are being supported by government policies and regulatory frameworks that encourage the development of fintech solutions and promote the adoption of digital financial services. As a result, mobile money platforms such as M-Pesa have led to the expansion of financial services into over 80% of the population in Kenya. Technological innovations can enhance financial inclusion, and Kenya has been cited as an example to other developing countries. Cameroon's banking system is more conventional with a gradually developing but still relatively undeveloped infrastructure.

Access to financial services, such as mobile money transactions, mobile money accounts, and ATM usage, loan application, account opening, mobile money agent has been steadily increasing in recent years, although it remains significantly lower compared to more advanced economies across Africa. Historically, financial inclusion in Cameroon has been constrained by factors such as low banking penetration, especially in rural areas, and a prevalent reliance on informal financial systems. Informal savings and credit groups continue to serve a significant portion of the population, particularly in rural areas, with minimal interaction with formal banking institutions. Lower bank account ownership rates and restricted access to formal credit facilities are also consequences of this. Despite this, the banking services of a country are gradually improving.

More financial inclusion has been the focus of commercial banks, the government, and international organizations in recent years. Banks are expanding their network, and more

ATM machines and branches are popping up all over the city. Consequently, there has been an upsurge in the number of bank accounts held and people turning to ATMs for money transfers and basic financial transactions. Despite these developments, many Cameroonians are still struggling to access financial services in the form of geographical barriers, inadequate financial literacy, and the high cost of banking services.

Although the use of digital financial services and mobile money continues to rise in the country, it still lags in comparison to neighboring countries like Kenya. Cameroon is gradually changing the face of its financial system in a bid to encourage more of its population to access the formal banking system. But while far from ubiquitous, like with a savings account or making payments by direct debit card, the general accessibility of credit facilities such as loans and overdrafts is on the rise. Change and knowledge have encouraged the country's financial system to improve the mild situation with the population's financial literacy.

Currently South Africa has one of the more developed and well embedded financial systems among African countries which degree of financial liberalization coupled with access to formal credit services are among the highest worldwide. South Africa has been described as having the highest rate of financial services both in terms of access and usage in Africa. To some extent access is determining the availability of banking services since majority of the adults from the metropolitan areas hold a banking account.

A good part of the country's financial sector has ATM and bank branches that make it easier for people to access banking services. Also, the use of debit cards is significant where billions of transactions occur daily for one service or the other. Civilian uptake of credit card, savings accounts, personal loans, and overdraft structures is high in South Africa. These, therefore, are clear signs that most people use these facilities frequently, meaning that they are already hooked on the financial system. Direct debits, credit facilities, requirements, cards and loans are often utilized by consumers in different personal and business capacities. Nevertheless, consumer rights are protected in the country by relating to the financial sector to run more credit incredibly, and South Africa's financial inclusion success factors are essentially composed of the top-notch regulatory systems, healthy banking rivalry, and governmental strategies that lead to the

advancement of the financial extent. Consumers using FICA programs are in a position of presenting identification and proof of residence, which have eased the banking industry.

Unfortunately, the policies in financial inclusion in South Africa have not fully moved the country beyond its inability to effectively target the unbanked and rural poor. While these gaps are being filled through digital banking and mobile payment solutions, the financial assets base in South Africa is rapidly growing and thus developing an international model of finance access and usage. Since the desire of the Rwanda government in facilitating FI is by supporting technology enhanced financial systems, like Kenya, the country has been an advocate of digital financial systems. With these implementations, the number of people with bank account ownership was expanded and especially the hard-to-reach people in rural areas.

The Rwandan government has taken steps to promote financial inclusion, including the establishment of Umurenge SACCOs (Savings and Credit Cooperatives), which offer low-cost financial services to local communities. The most significant development is the advent of mobile banking, which allows users to open accounts, transfer money and access credit as well as savings products via mobile devices. Today, millions of Rwandans who may be locked out from any formal banking facilities are able to receive cash transfers via MTN Mobile Money and Airtel Money among others – both of which are widely used across the country. Specifically, in Rwanda the financial inclusion strategy states that more emphasis should be put on such areas as digital literacy and going cashless. Mobile payments for goods and services and, particularly, government transactions, such as school fees have rampantly grown because of the government's call for a cashless economy.

Additionally, easy access to money through Automated Teller Machines ATMs, debit cards, and digital savings account, have made formal banking more reachable by a broad cadre. Nonetheless, Rwanda is slowly coming on board with the introduction of digital transformation and mobile banking services with Rwanda expected to emulate the success of others in Africa. This study found that Rwanda and Namibia have made good progress towards financial inclusion in the hope of embracing technology and mobile

solutions for the under banked and directly into accounts of the banks and other formally reported evidence of financial institutions and through government effort and the financial sector expansion.

Informal sources of credit and saving and new measures for enhancing financial inclusion and literacy have been felt within the last few years. It forms part of a range of measures aimed at getting more people, especially those in rural areas, into the financial mainstream. Formal bank accounts together with credit, savings, and insurance facilities have been the focal points of governmental policies under financial inclusion strategies, such as the National Financial Inclusion Strategy. Similarly, Namibia has improved the available and utilized technologies such as ATM, debit card, mobile banking and so on and hence, the availability of banking services has increase. Most of the banks across the nation are going for e-commerce banking, the one that involves opening of accounts for banking and the other banking services such as banking transfer and other activities such as bill payment through mobile phones. More people are now employed in the neighbour formal banking sector and fewer of them are moving around dealing with cash due to this factor.

Several financial assets with which the Moroccan population engages are being adopted. Savings accounts, direct debit payments and credits such as loans, overdrafts, or credit cards, are on the increase in the urban parts of the world. Appropriate banking services are quickly being adopted by people as well as companies, hence getting more and more involved in the financial systems. This is on account of the Governments and the financial institutions that have initiated the process of financial education programs. The. The intended outcome of such programs is to encourage people to actively save; to borrow sensibly; and to use financial services wisely.

The improvement of this variable is also ensuring that not only the financial enrolment is being made better, but the people of Namibia get full access to numerous financial services. However, Namibia still experiences challenges to broaden the segment of rural areas, and the inequalities in the distribution of financial resources envisaged between urban and rural regions. This trend is, however, not sustainable. But focusing more firmly on the use of digital solutions and financial literacy, the nation is able to achieve higher

levels of financial inclusion in all spheres of its people. Though, the situation has changed a little now there are several challenges on financial sector inclusion in Togo such as instability in economy and political systems. Most of the citizens cannot afford to access formal financial services owing to the prevailing economic conditions, high inflation rate and an aggravated banking sector in the country.

Despite these challenges, efforts were made to expand fundamental banking services for credit amenities to improve the country's share of the population with access to financial services. However, the absence of effective banking services in Togo is well preserved due to the very significant number of people who do not own bank accounts or are still using alternative forms of banking. However, in the past couple of years, both local and global governments have tried to solve these problems through offering more bank accounts and ATM machines, while the unbanked urban centers had to try and open more branches of the bank and number of ATM centers.

The government has also tried to enhance the frontline service delivery to the targeted people. The readiness of a cashless society with the help of digital banking and mobile payment has become more popular in Togo and therefore slowed down the sector's development. However, mobile banking could assist in resolving some sort of geographic traps that hinder access, in the regions where normal banking services are absent. Also, while other countries have made comparable strides in the development of digital banking and mobile payment, Togo's financial sector has experienced a decline. However, mobile banking could help to address some of the geographical barriers that prevent access, especially in places where traditional banking services are not available.

Regarding usage, Togo financial inclusion can be said to have been mainly aimed towards offering people in Togo access to the basic financial services like credit facilities including but not limited to small loans and micro financials services which are critical ingredients in supporting the economic activities of people and small businesses. Nevertheless, the opportunities for debit cards and direct debit payments and, more sophisticated credit products like credit cards and the like are limited up to now. First of all, inadequate financial infrastructure and low level of literacy in financial matters in the population can be named. In addition, to modernize the financial sector in Togo, the country has started

implementing the models of digital banking and mobile payments even though the implementation process in Togo has been slower compared to the process in the neighboring countries. In the case of uniting the usage of mobile banking, it could also be significant in the issues of bridging geographical gaps that hinders banking services in the remote areas. Nevertheless, owing to the economic factors that are prohibiting the growth of the country's economy, endeavours to enhance the provision of basic banking amenities and credit facilities seem to offer the only viable way of enhancing financial inclusion in Togo. Sustaining funding for the infrastructure and, especially, the relevant education of the population will prove to be critical to increasing access to the structures of the FMS in Togo.

Financial sector is fairly well developed in Gabon: increasing year by year the usage of basic services such as having a bank account and focusing on further usage of all kinds of services more often. In the last 10 years, however, the country has come a long way in terms of formalization of financial services to the populace, with the government and regulators setting in motion policies and policies to increase the uptake of banking services among the populace. As for financial inclusion, the country has observed the growth of the account ownership of the population and especially in urban areas where the banking sector is already available. The government has also been in the mission of increasing people opening or operating an account with a bank through developing program aimed at reducing obstacles with a view of increasing account opening especially by the BPOs and other low-income earners as well as residents in the rural areas.

Considering credit and debit cards for payments and withdrawals as well as Automated Teller Machines for account operation is helping Gabon incorporate more of banking services. As for usage, Gabon is aiming at deepening the uptake of savings products so that the citizens actively participate in accumulation of formal savings. Others that are on the increase include payments through direct debit, overdrafts, and credit facilities which include personal loans and credit cards. These services also help provide people, as well as companies, with additional tools for controlling their financial situation and for getting funds which will promote economic operations.

Over the years, the country has also initiated a number of campaigns to enhance financial literacy for the citizen in order to enable him or her to take advantage of the various products offered by the financial institutions. With regards to free and responsible use of savings, responsible borrowing and efficient usage of credit, Gabon is striving to achieve responsible access to be part of the financial system. However, there are still some problems in providing access to credit to rural population and in increasing the density of financial facilities in regions. Still, further development of the digital initiatives and financial literacy in Gabon will lead to an increase of the population's financial inclusion of all population later in the year. Gabon has built an average financial structure in terms of banking accounts, and there is a continually improving process in developing more uses for various types of financial services.

The past decade has seen remarkable progress during Financial Inclusion, which is mainly attributable to government actions and changes that have served to expand both access to and demand for formal financial services by integrating a larger population segment into financial systems. Regarding financial inclusion, Gabon has had an improvement in account penetration, but it is mostly in the urban area where the banking sectors have well developed. In order to increase the population's usage of banks, the government has introduced measures that contributed to making bank accounts easily accessible with easy steps, free or low account fees, and hence targeting the needy, those in the rural areas.

The use of ATMs and debit cards has been on the rise among the people of Gabon, so more Gabon have been able to manage their banking services needs for payment and withdrawal of cash easily throughout the nation. As far as the use of the savings products are concerned, Gabon is keen on increasing the uptake of the citizens on the products and make them more effective customers to the formal financial sector for accumulation of wealth. This shift is evidenced by the increased credit sales, and the rising use of direct debit payment, overdrafts, personal credit facilities like loans and credit cards. These financial services offer the clients and consumers of financial services a portfolio of financial products in money management and credit facilities to facilitate various economic activities. Recently, the country has stepped up efforts in improving on the

citizens' ability to make sound financial decisions to be able to fully take advantage of the existing financial services. To create greater awareness of savings, responsible borrowing, and harnessing credit, Gabon is trying to guarantee that more citizens can efficiently benefit from Gabon's financial system.

4.3 Research Design

Research design is a framework that presents how the whole data for this study is collected. According to Saunders, Lewis, and Thornhill (2009), the method of subject selection, study area, and technique used for collection of data based on the research questions depend on the research design. Therefore, the goal of this study typically depends on the research design, as it is used to justify the result of this study. Setia (2016) reviewed that research design has been used by many authors as a means of strategic framework for an action to serve as a bridge between the research question and the implementation of research strategy.

Hence, this study adopted a cross-sectional research design because it enabled this study to collect data on financial technological advancement, financial education, economic growth, level of employment, domestic credit to the private sector, and bank competition as determinants of financial inclusion from the selected Sub-Saharan Africa countries at the same point, allowing this study to investigate the outcome of financial inclusion. Descriptive studies tend to be less time consuming and need fewer resources than any other kind, upending cohort and especially prospective ones (Thompson, 2012). These variables and Sub-Saharan Africa countries are selected based on the inclusion and exclusion criteria set for this study.

4.4 Model specification

Theoretical Framework

The inquiry of the determinants of financial inclusion in Sub-Saharan countries is underpinned by the systems theory of financial inclusion, public good theory, special agent theory of financial inclusion, financial technology, and financial literacy theory of financial inclusion. These theories explain the possible drivers of financial inclusion which among many include agents of financial inclusion which can take the form of financial intermediation through banks and financial markets, financial education, and regulation

in the financial system and this is a theoretical research model developed from the given information, may require changes and the next step will be to go back to source materials and experts to test the model and minimize sources of systematic error.

Thus, based on the theoretical background to this study and its nature, the type of data used, with regards to specific variables and their interactions in the actualization of financial inclusion, because of the fact that access to financial inclusion does not automatically translate to (or is the same as) usage of financial inclusion, which is important in the selection of the variables for financial inclusion, the research model for this study is thus specified below,

$$y_{it} = f(x_{it}) \dots \dots \dots (4.1)$$

Where y_{it} = the lack of access and use as well as or at a given time is represented by an index that integrates both aspects. Based on the previous work, the access dimension is measured by the number of account openings and ATM availability while the usage dimension is measured by the reported savings, direct debit card payments as well as overall use of credit facilities, encompassing credit cards, loans and overdraft.

x_{it} = Potential antecedents of financial inclusion at a time can be said to include, among others: Financial Technology, Financial Literacy, Economic Development, Employment, Domestic Credit to the Private Sector, and number of Banks. Based on this model, it has been revealed that Financial Technology has the propensity to provide an impact on financial inclusion, *ceteris paribus* and literature also goes on to show that Financial Technology has an impact on the level of financial inclusion but that this effect is moderated by other factors such as financial literacy and macroeconomic conditions. Accordingly, it is possible to expand the model in relation to these additional explaining variables, as shown below.

$$y_{it} = f(x_{it}, z_i) \dots \dots \dots (4.2)$$

Where z_i = other explanatory variables.

Equation 4.2 similarly shows that there would be a change in the level of financial inclusion as captured by the proxy of financial inclusion which are the measures of financial inclusion such as ATMU (ATM), BankB (Bank Branches), Borrowed from formal

financial institution, financial institution account, made a digital payment, own a debit card, owns a credit card, received digital payment, received wages into financial institution account and those that Saved in Financial Institution, covering two dimensions of financial inclusion (access, and usage), used in constructing a financial inclusion index (FII) using a principal component analysis; when there is any change in the independent variables including Financial Technology and the other explanatory variables. The estimation model is shown in equation 3:

$$FII_{it} = \beta_1 + \beta_2 FTECH_{it-1} + \beta_3 FEDU_{it-1} + \beta_4 GDP_{it-1} + \beta_5 E_{it-1} + \beta_6 DCP_{it-1} + \beta_7 BC_{it-1} + \mu_{it} \dots \dots \dots (4.3)$$

Where:

FII stands for financial inclusion index, FTECH for Financial technological advancement, FEDU for Financial Education, GDP stands for Economic Development and E signifies the degree of Employees, DCP stands for Domestic Credit to Private sector while BC stands for Bank concentration in the sub-Sahara African countries.

4.5 Definition and Apriori Expectations

Financial Inclusion is defined as a process through which access to financial services is guaranteed adequately and in a timely manner in areas of need (Riley, 2019). Also, Omar and Inaba (2020) defined FI as the whole effort geared towards putting proper financial services at the reach of primarily low-income people (who are the ones mostly excluded from the use of formal financial services) at affordable prices. In this study Financial Inclusion is determined by Financial Technological advancement, financial education, domestic credit to private sector, Employment level and bank concentration, which can be a propeller of financial inclusion as is seen in literature.

Financial Technology is defined in line with Mohr (2015), in which technology is considered as the fifth factor of production. Maintaining that societies can produce more goods and services with a given number of factors of production. In the same way, discovery of new knowledge put into practice invariably, improves the way banking is done with the aid of technology is financial technology (Liu and Walheer, 2022) and just like technological advancement improves production with the same number of factors of production, improved financial technology by means of innovative and advanced banking

methods is anticipated to improve financial inclusion as well. It is proxied by online banking application use.

As Cook (2018) pointed out correctly, even though financial literacy is now a comparatively modern subject, it is a matter of degree whether someone has a good or bad grasp of the topic. She established the key on financial education as the term “smart money sense.” Taking from Rieger (2020) financial literacy was described as the capability of a person to act financially wisely. In his article Remund (2010) offered a broader description of money knowledge and understanding which includes skill, know-how, know-why, know-what, know-who and know-where to obtain an index of personal financial health, that is the ability to make sound financial decisions and in turn attain optimal financial wellbeing.

In this study, financial education is measured by routinely the level of education of the population to enhanced determination of their account interaction as identified by the hypothesis that higher levels of education are correlated with larger account interaction. The assumptions are that there is likely to be a high correlation between financial education and financial inclusion and that as the level of financial education rises in the SSA countries, various barriers linked with the enhancement of financial inclusion could be tackled.

Mohr (2015) on his part described economic growth as the rate at which total output or total income in an economy increases in a given year, on a per capita basis, and inflation adjusted basis. In this perspective, economic progress is defined by a rate of increase in total real Gross National Product (GNP), or Gross Domestic Product (GDP), per capita or per head of the population. As is usually observed in practice, economic growth is equated strictly to the annual increase in real income or output, which is intended to be positively affected by financial inclusion. That is, as the economy expands, there could be more demand for operating under a roof with formal financial institutions, and therefore the level of financial inclusion will also grow.

E is the level of employment which Mohr (2015) pointed out, is the proportion of economically active people, which means the overall population actively seeking work or capable of earning an income. He pointed out that some may work only during the weekends or more probably during holidays, others may have fixed term employment, some others work in the black market legally or illegally. Indeed, Mohr also noted that there are problems related to the level of employment through noticing the issues arising from the definition and measurement of unemployment that results to great disparity in unemployment rates among researchers.

For the purpose of this study the labor force participation rate shall be adopted as the employment variable. The expectation is that with increased employment levels in Sub-Saharan African countries, greater demand for bank accounts follows and hence, positive changes in financial access. DCP means Domestic Credit to the Private Sector that is loans, trade credits and other non-equity purchase of securities and accounts receivable by the private sector from the financial institutions. As Duican, Moisescu, & Pop had pointed out effectively the functionality of bank is to earn a profit on the credit facilities it extends to borrowers for investment or consumption needs.

In this study, DCP is assessed in terms of the proportion of GDP in sub-Saharan Africa while the correlation between the two variables DCP and financial inclusion is expected to be positive. BC is an abbreviation of Bank Concentration. According to the World Bank (2012) Bank competition is determined by the bank concentration as well as the Boone indicator and the Lerner index (Ngonyama & Simatele, 2020). It is hypothesized that there is an upright relationship between the level of bank competition and the level of financial inclusion.

4.6 Data Sources

The panel data used in this study is secondary data. The data was sourced from Global FINDEX - World Bank statistical bulletin, Macrotrends data base and Global Financial Development data base for the period of 2011 to 2021 and they are pre-existing on various data platforms.

4.7 Data Analysis

The methodology of data analysis in this study utilizes several econometric techniques so that the results can be both reliable and valid. This is followed by the descriptive statistics analysis to give the researcher some sense of the nature of the data collected through mean, median, standard deviation, and range. Subsequently a correlation matrix adopting Pearson correlation coefficients is employed to understand the relationships between various variables present and to detect the existence of multicollinearity problem.

Principal Components Analysis (PCA) is applied in the analysis to the data in a manner that maintains most of the information. So that the important aspects which contribute towards the variance present in the data set are focused and highlighted. Subsequently, unit root tests are performed to analyze the stationarity of the variables which is essential in the study of panel data. Using a panel-adapted version of the Augmented Dickey-Fuller (ADF) test framework, that is Fisher's ADF test, the stationarity of the data in this study is tested. Panel data combines cross-sectional and time-series dimensions, rendering it more complex in terms of conducting tests for stationarity as compared to pure time series. Though the conventional ADF tests are for a time series, adaptation of the ADF method for a panel structure requires using the Levin, Lin & Chu (LLC) test and the Im, Pesaran & Shin (IPS) tests, which develop autoregressive processes that vary from one individual cross-sectional unit to another.

In econometrics, panel unit root tests are thought to be very potent for studying the stationarity of panel data sets. To substantiate this, Barbieri (2006) in a review on panel unit root testing submitted that a considerable amount of study has been conducted regarding cointegration and unit roots presence in panel-data where combined time series is used, owing to novel datasets accessibility in which a blend of cross-sectional dimension as well as time series being in matching order. Therefore, there is a need for new techniques in the analysis of panel data due to its peculiarities. In lieu of this, two generations framework of testing was developed for unit root testing in panel data, where Chu, Lin and Levin (2002) and Shin, Pesaran and Im (2003) covered the first-generation

tests with a principal limitation of cross-sectional independence present in the assumption, but the cross-sectional independence hypothesis is rejected in the second generation of tests. Prominent among the second generation of unit root tests are the factor structure approach contributed by Moon and Perron (2004a), Phillips and Sul (2003), Bai and Ng (2004a), and Pesaran (2003). As well as the Chang (2002, 2004) adopted covariance restrictions approach. Accordingly, this research employs Fisher's panel ADF test to carry out the unit-root test, coinciding with what has been largely documented in the literature concerning how stationarity tests represent very essential prerequisites in the analysis of the panel data, particularly when dealing with macroeconomic and financial data.

4.8 Estimation Techniques

Estimation in this study has been carried out using the difference GMM techniques. The decision to adopt difference GMM by Arellano and Bond (1991) is because it is suitable for dynamic panel data, controls for time invariant variable bias and corrects for possible endogeneity biases created when lagged dependent variables are included as explanatory variables into the model. The difference GMM uses model equations in levels and first differences with suitable instruments, so that estimates of the parameters and their precision is consistent. This method is mainly best for the studies which are based on such datasets which are related to economics and finance because such areas typically have endogeneity and serial correlation as the major issues of concern.

The Difference GMM technique particularly applies to dynamic panel data structures with a number of cross-sectional units (N) being greater than the number of time periods (T), and when including the earlier values of the dependent variable among its predictors in the model. Here, OLS or fixed effects estimators would most likely produce estimates that are biased and inconsistent due to their endogeneity and autocorrelation. The Difference GMM technique solves these problems through the following approaches:

1. The first difference of the model is to strip off fixed unobserved individual effects over time.
2. Lagging the levels of the endogenous variables and using them as instruments for differenced equations so as to avoid endogeneity.
3. Improving the consistency of the parameters estimated by taking advantage of moment conditions created from the assumptions about the error terms.

The general form of dynamic panel model through which Difference GMM models can be shown, is:

$$Y_{it} = \beta y_{it-1} + \beta X_{it} + U_i + \varepsilon_{it} \quad (4.4)$$

Where:

y_{it} is the dependent variable for the Unit i at t time.

y_{it-1} is the lagged dependent variable,

X_{it} is a vector of explanatory variables

U_{it} captures the unobserved individual-specific effects, and

ε_{it} is the error of term

The effective estimation of the model following the elimination of u_i , using the first differencing of the equation is achieved by using appropriate lagged values of both y_{it} and X_{it} as instrumental variable. Research Methods in Finance and Economics: Relying on Difference GMM Methods Specifically, the technique described above would be appropriate for applying the methodology of study in economy and finance, in which the common areas of concern now concern endogeneity, measurement errors, and

autocorrelation. It is therefore possible to obtain robust and consistent parameter estimates under the phenomenon.

4.9 Diagnostic Checks

In order to ascertain the reliability of the model, a number of diagnostic tests were performed. First, the unit root test establishes that each variable is stationary to the level required for econometric analysis. In addition, the model is also subjected to tests of autocorrelation and heteroscedasticity to confirm that the residuals under the estimation are also well behaved and have satisfied the assumptions of the estimation technique of the model. Lastly, the validity of the instrumental variables for the Difference-GMM estimation is verified by the Hansen J-test and the Arellano-Bond test for autocorrelation. These diagnostic checks help in ensuring that the results generated are accurate and can be relied upon.

4.10 Ethical Considerations

This study relies on secondary data which is readily made available in the public domain and research study of this nature will wish to follow ethical principles and considerations throughout the research process. Nonetheless, the University of Fort Hare (UFH) is committed to consistent pursuit of excellence in teaching research and community engagement and thus has detailed modalities for ethical clearance consideration application. The University's Research Ethics Committee (UREC) at UFH oversees the established guidelines for ethical compliance of all research endeavours in the institution to ensure that there is no violation of confidentiality or infringements or whatsoever on copyrights and intellectual property rights. Thus, application for Secondary data research ethical clearance was made to IFREC (Inter-Faculty Research Ethics Committee) through the designated office at the Faculty of Management and Commerce with the study lead supervisor serving as contact person as stipulated by UFH and ethical clearance was granted for the study. Besides, every information source consulted in the research process is duly and appropriately given credit and referenced in the work to protect the scholarly work from been accused of plagiarism. Additionally, the information accurately describes the approaches used in the evaluation, the methodologies unbiased and the results reflect the actual relationship among the examined variables.

4.11 Conclusion

To conclude this chapter, the data analysis procedures, estimation techniques, diagnostic controls, and ethical frameworks utilized in this study were presented. It lies with the descriptive statistics, PCA, correlation analysis, unit root testing, and the estimation of system GMM to present a systematic and syncretic approach of investigating the research questions. In the subsequent chapter, the results are presented and explained – within the methodological context laid out in this chapter.

CHAPTER FIVE

DETERMINANTS OF FINANCIAL INCLUSION IN SUB-SAHARAN COUNTRIES: ESTIMATION, INTERPRETATION, DISCUSSION AND PRESENTATION OF RESULTS

5.1 Introduction

This chapter focuses on the analysis, interpretation, discussions and presentation of results on the determinants of financial inclusion in SSA. The financial inclusion is structured as financial inclusion index measured by ATMU (ATM), BankB (Bank Branches), Borrowed from formal financial institution, financial institution account, made a digital payment, own a debit card, owns a credit card, received digital payment, received wages into financial institution account and those that Saved in Financial Institution, covering the dimensions of financial inclusion (access and usage), determined by Financial technological advancement (FTECH), Financial Education (FEDU), Economic Growth (GDP), Level of Employment (E), Domestic Credit to Private sector (DCP) and Bank concentration (BC). Furthermore, this chapter analyses and interprets descriptive statistics which explain the Mean, Median, Maximum, Minimum, Std. Dev., Skewness, Kurtosis, Jarque-Bera, and Probability, as well as the Pearson Correlation Coefficients, Panel Augmented Dickey-Fuller test statistic and Generalized Method of Moments (GMM).

Also, to satisfy the objectives of this study, financial inclusion in SSA, a panel data is used in fifteen countries drawn from the four blocks of the SSA region (East Africa, West Africa, Central Africa and Southern Africa from 2011-2021). This is prime for the region because of the high and rampant dependance on the informal financial sector in the region among other things, such as low-level economic growth, unemployment, high illiteracy and so on. In addition, the literature and empirical framework informed the specification of the model and the theories that underpinned this study have been discussed as well as the key empirical works in this field that have guided the model specification. This chapter is largely divided into three main sections; analytical framework that led to the derivation of the model for this objective, diagnostics checks followed by the presentation of the results.

5.2. Principal Components Analysis (PCA)

The variables (ATMU - ATM, BankB - Bank Branches, Borrowed from formal financial institution, financial institution account, made a digital payment, own a debit card, owns a credit card, received digital payment, received wages into financial institution account and those that Saved in Financial Institution) used for financial inclusion are very homogenous and will be highly correlated, hence, PCA is needed to generate an index of financial inclusion which serves as the dependent variable in the model and to show that data has a certain structure, the mean of each variable and the correlation matrix were analyzed using Principal Component Analysis (PCA). Below is the component selection result which indicated that the selection is optimal.

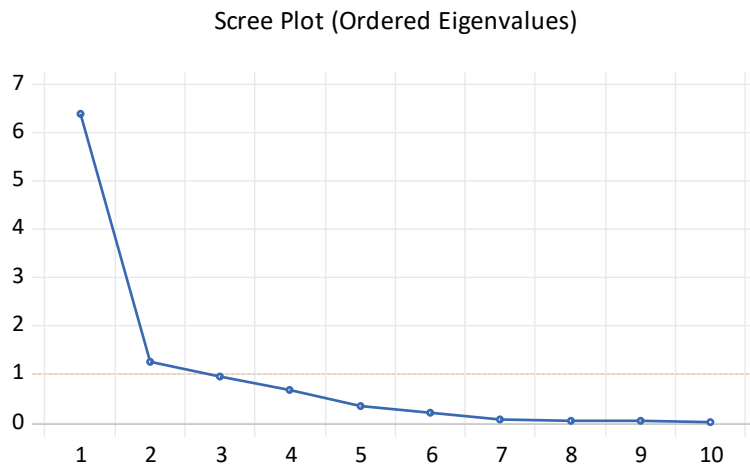
Table 5.1. Component selection Result

Automatic component selection: Simple Maximum factors (MF): 10 (User) Minimum eigenvalue (ME): 0 Eigenvalue cumulative proportion (CP): 1 Criterion: Minimum of conditions Components selected: 10	
Components	Value
Minimum eigenvalue	10*
Eigenvalue cumulative proportion	10*
Maximum factors	10*
(*) Optimal number of components.	

Source: Source: Eviews 13, 2024

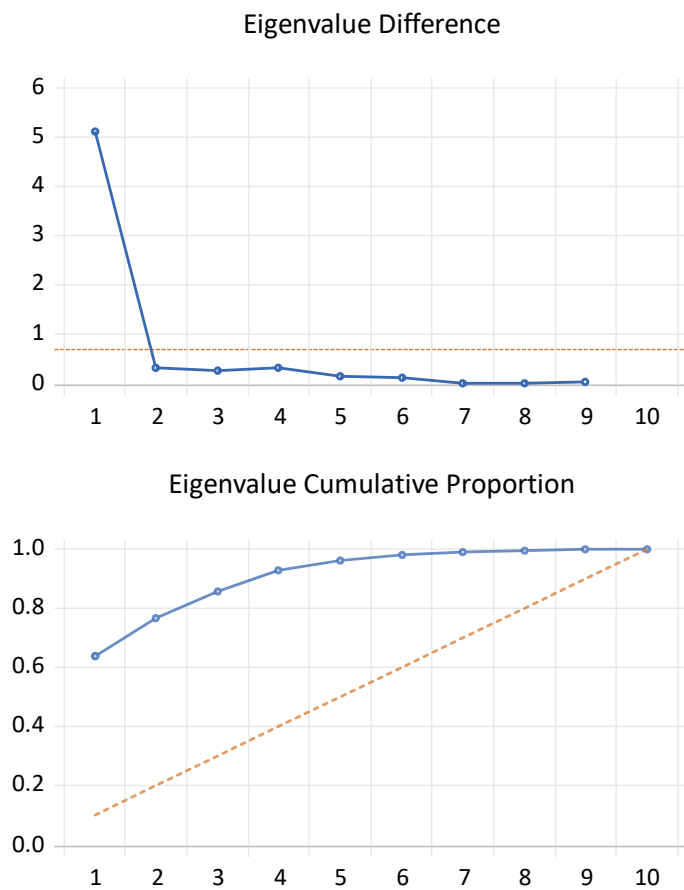
Also, below are the scree plot or the ordered Eigenvalue, Eigenvalue difference and the Eigenvalue distribution proportion diagrams, justifying the necessity for the principal components.

Figure 5.1: Scree Plot (Ordered Eigenvalues)



Source: Source: Eviews 13, 2024

Figure 5.2: Eigenvalue Difference and Cumulative Proportion



Source: Source: Eviews 13, 2024.

Table 5.2 Principal Components Analysis

Principal Components Analysis						
Date: 12/08/24 Time: 09:09						
Sample (adjusted): 2 64						
Included observations: 43 after adjustments						
Balanced sample (listwise missing value deletion)						
Computed using: Ordinary correlations						
Extracting 10 of 10 possible components						
Number	Value	Difference	Proportion	Cumulative Value	Cumulative Proportion	
1	6.3645	5.0970	0.6365	6.3645	0.6365	6.3645
2	1.2674	0.3258	0.1267	7.6319	0.7632	1.2674
3	0.9416	0.2684	0.0942	8.5735	0.8574	0.9416
4	0.6732	0.3164	0.0673	9.2467	0.9247	0.6732
5	0.3568	0.1530	0.0357	9.6034	0.9603	0.3568
6	0.2038	0.1238	0.0204	9.8072	0.9807	0.2038
7	0.0800	0.0276	0.0080	9.8872	0.9887	0.0800
8	0.0524	0.0079	0.0052	9.9397	0.9940	0.0524
9	0.0446	0.0288	0.0045	9.9842	0.9984	0.0446
10	0.0158	---	0.0016	10.0000	1.0000	0.0158

Source: Source: Eviews 13, 2024

From Table 5.2, analyzing the explained variances of each PC, it was possible to determine that the first PC, which can be linked to any variable in particular from the eigenvectors (loadings) in Table 5.3, has the most contribution proportion of 63.64% of the total variance and the last four PCs contributed the least. Infact, the four of them joint proportion contribution is less than 5%. However, the eigenvectors (loadings) revealed a very interesting fact with BankB having 94% under PC3, exposes the reality that lots of people still rely on in-contact banking, justifying the needs for more bank branches for many countries to experience more financial inclusion. Moreover, most of the PCs have high cumulative proportions of above 90% of the component justifying the need for the PCA, with only three components below 90% out of ten of them.

Table 5.3 Eigenvectors (loadings):

Variable	PC 1	PC 2	PC 3	PC 4	PC 5	PC 6	PC 7	PC 8	PC 9	PC 10
ATMU	(0.1209)	0.7655	(0.1602)	0.3661	(0.1211)	0.4662	0.0208	0.0779	(0.0333)	0.0087
BANKB	0.1219	0.2214	0.9368	(0.0031)	0.2125	0.0461	(0.0028)	0.0384	0.0812	0.0565
Borrow FFFI AGE15	0.3406	(0.0172)	(0.1890)	(0.0282)	0.7503	0.2603	(0.2733)	(0.0346)	(0.3741)	(0.0225)
FI Account AGE 15	0.3726	0.2277	(0.0633)	0.0211	(0.0365)	(0.1714)	0.0793	(0.8531)	0.1912	(0.0592)
Made Dig Payment Age 15	0.3057	(0.3309)	0.0056	0.6141	(0.0897)	0.1144	(0.0345)	0.0240	0.1302	0.6164
Owns Credit Card Age 15	0.3417	(0.0673)	(0.0988)	(0.4956)	(0.0570)	0.5425	0.1777	0.1468	0.5167	0.0752
Owns Debit Card Age 15	0.3615	0.1232	0.0385	(0.1784)	(0.4691)	(0.0729)	(0.7501)	0.1184	(0.1365)	(0.0082)
Rec Dig Payment Age 15	0.3572	(0.1890)	0.0400	0.4332	(0.0698)	0.0444	0.0955	0.1979	0.1294	(0.7586)
Rec Wages in Acc. Age 15	0.3772	0.0249	0.0618	(0.1485)	(0.3001)	0.0330	0.5385	0.0648	(0.6615)	0.0913
Saved at Finl Age 15	0.3240	0.3838	(0.2009)	(0.0193)	0.2225	(0.6063)	0.1550	0.4288	0.2426	0.1521

Source: Source: Eviews 13, 2024

Table 5.4 Correlation Matrix of the Components used in measuring Financial Inclusion Index

Variable	ATMU	BANKB	Borrow FFFI AGE15	FI Account AGE 15	Made Dig Payment Age 15	Owens Credit Card Age 15	Owens Debit Card Age 15	Rec Dig Payment Age 15	Rec Wages in Acc. Age 15	Saved at Finl Age 15
ATMU										
BANKB	(0.0258)	1.0000								
Borrow FFFI AGE15	(0.2649)	0.1508	1.0000							
FI Account	(0.0693)	0.2916	0.7914	1.0000						
AGE 15	(0.3911)	0.1434	0.6378	0.6342	1.0000					
Made Dig Payment Age 15	(0.3812)	0.1631	0.7699	0.7702	0.5055	1.0000				
Owens Credit Card Age 15	(0.1956)	0.3131	0.6666	0.8854	0.5928	0.8201	1.0000			
Owens Debit Card Age 15	(0.3495)	0.2538	0.7426	0.7892	0.9503	0.6559	0.7477	1.0000		
Rec Dig Payment Age 15	(0.2937)	0.3298	0.7295	0.8933	0.6684	0.8646	0.9136	0.8182	1.0000	
Rec Wages in Acc. Age 15	0.0831	0.1949	0.7492	0.8926	0.4420	0.6365	0.7639	0.6256	0.7533	1.0000

Source: Eviews 13, 2024

What is more is that some of the variables used have a very low variance in some PCs. For instance, PC3, those that make use of digital payment is approximately 1% and in PC10 (ATMU and those that own a debit card), showed that these services are still very poor in many places in the SSA region. Additionally, further analysis of the eigenvectors (loadings) showed that the second principal component (PC2) which has 0.13 contribution in the PCs variance can be linked to ATM activity captured by 0.7655 is not unusual because, besides technological advancement which might bridge the gap of in-contact services and make people rely less on branch walk-ins (which unfortunately many still have either difficulty or sentiments to use), making ATMU the next important component in the measure of usage of financial inclusion is still very low in many places in the SSA.

The third component, PC3 as earlier stated, is considerably affected by Bank branches with coefficient of 0.94 and PC4 is linked more to three variables digital payment (0.61), those that own a credit card (0.5 approximately) and those that receive digital payment (0.43). PC5 is linked to those that borrowed from financial institution, which is a good thing for usage measure of financial inclusion that more people are now using financial services in the region. The variable used in conceptualizing the index of FI are seen connecting well with the PCs, displaying that this component well conceptualizes aspects of the traditional banking architecture and lending. Meanwhile, table 5.4, correlation matrix, test the association between the original variables used in the experiment.

Confirmatory evidence exists from the ordinary correlation matrix, that significant correlation of 0.75 is apparent between those that received wages into their account and those that Saved in Financial Institution thereby controlling the primary component of the overall first principle. This is basic and true because savings cannot be saved in account without using receiving wages in the account. Wages precede savings, The second level principle is that financial inclusion takes place between receiving digital payment and wages received into financial institution account (0.82) and those that Saved in Financial Institution (0.63) respectfully. Also, owning a credit card correlates with receiving digital payment, receiving wages into financial institution accounts and Saved in Financial Institution respectively at 0.66, 0.86 and 0.64. This is how the ordinary correlation matrix shows the rank progression in the link among the PCs components.

Also, a significant correlation of 0.89 is obvious in those that have financial institution account and those that received wages into financial institution account as well as those that Saved in Financial Institution and other moderate correlation exists among other components too. However, slightly weaker association is also observed in the components, and the analysis of the identified factors has demonstrated the importance of bank branches, ATM usage and digital banking based on their high coefficients of contribution to the formation of PCs as well as the continued relevance of such traditional banking facilities. It is also revealed that in the observed financial ecosystem financial inclusion can be determined simultaneously by both digital financial services and conventional banking systems.

Table 5.5: Pearson correlation coefficients for Financial Inclusion Variables

Covariance Matrix							
	FTECH	LFEDU	GDP	LE	LDGP	LBC	C
FTECH	0.00050	0.05604	-0.00019	-0.00089	0.00262	0.00919	-0.05198
LFEDU	-0.00075	0.03963	-3.24394	-0.00565	-0.00092	0.05051	-0.26311
GDP	-0.00019	-3.24395	0.00018	0.00034	-0.00153	-0.00253	0.01648
LE	-0.00089	-0.00565	0.00034	0.02709	-0.03218	-0.01537	0.12964
LDGP	0.00262	-0.00092	-0.00153	-0.03218	0.06485	0.02164	-0.25625
LBC	0.00919	0.05051	-0.00253	-0.01537	0.02164	0.86102	-3.93436
C	-0.05198	-0.26311	0.01648	0.12964	-0.25625	-3.93436	18.63368

Source: Eviews 13, 2024

5.3 Descriptive Statistics

The dataset comprises 43 observations from 15 Sub-Saharan African countries: Angola, Cameroon, Chad, Nigeria, South Africa, Namibia, Botswana, Lesotho, Benin, Togo, Rwanda, Namibia, Togo, Ghana, Gabon, Nigeria, Rwanda, Ethiopia, Kenya and Zimbabwe. The inclusion of these countries was primarily based on the availability of data for the variables used as the components of financial inclusion index and the explanatory variables (FTECH, FEDU, E, DCP, GDP and BC) for the period between 2011 and 2021.

The frequency tables contain information about the number of cases, minima and maxima as well as arithmetic means and standard deviations among others. It is basically a measure of central tendencies, dispersion and normality. In this section, the descriptive statistics of the variables used in this study are enumerated below and the descriptive statistics of all the variables of interest are presented in table 5.6 as follows.

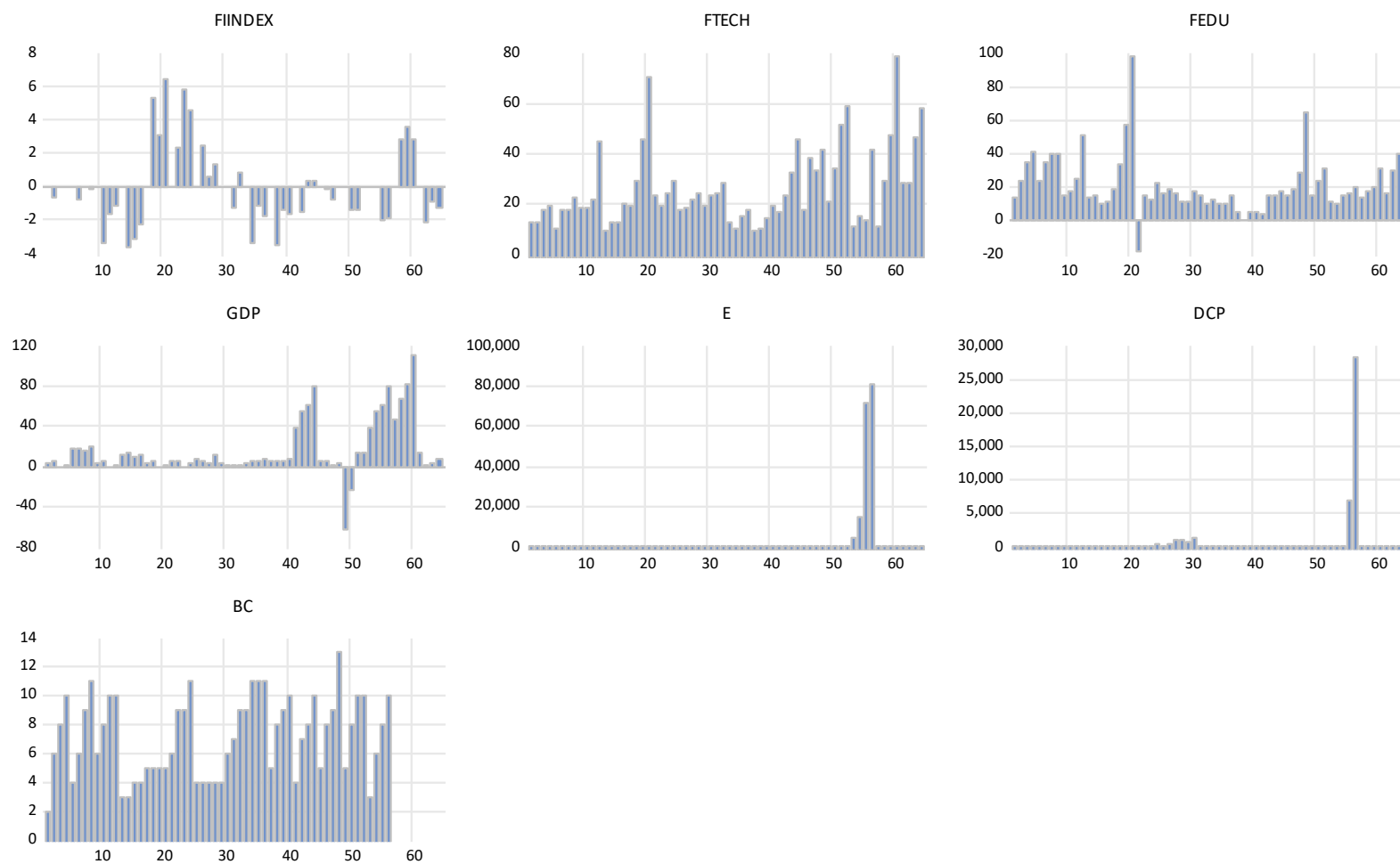
Usually, the variable of financial inclusion is supposed not to be analyzed because some of the variables used in its composition have an element of a log in them and it is usually advisable to use natural numbers instead of logs or transformed numbers. To begin with, the mean of the FIINDEX is the lowest followed by the BC and GDP, which may explain the reason for the insignificance of the two variables in the analysis. In the same way, besides FIINDEX GDP has the lowest median at 63100 and 8000 respectively. Meanwhile, DCP has the highest number followed by E. Also, while the maximum number of FIINDEX is the lowest followed by BC, But GDP has the lowest number. In addition, DCP has the highest standard deviation, which can be linked to its performance in the analysis, indicating it to be a well dispersed variable as well as GDP, FEDU, and E respectively. All the variables are positively skewed at above zero except for BC at -0.3 and this shows most of the variables are leptokurtic, implying they are long tailed or peaked variable, except for BC that is mesokurtic. Again, many of the variables passed the jarque-Bera's distribution test, which is the difference between skewness and kurtosis, except for BC and GDP that were above the 0.05 JB significance test mark. This shows that most of the variables used are well suited for the purpose of the analysis.

Table 5.6 Descriptive statistics

	FIINDEX	FTECH	FEDU	GDP	DCP	E	BC
Mean	(0.1401)	26.5762	23.8536	13.9505	1,060.9829	4,135.1064	7.9459
Median	(0.7833)	22.9000	17.5905	6.3100	20.4000	15.7719	8.0000
Maximum	6.3938	70.5000	97.5500	79.5244	28,146.0000	80,414.1000	13.0000
Minimum	(3.6200)	10.5000	0.2323	(24.0000)	1.6169	0.1000	3.0000
Std. Dev.	2.5658	13.4556	19.0036	22.7067	4,718.6563	17,432.8919	2.5921
Skewness	1.0426	1.2064	2.0256	1.8048	5.3705	3.9685	(0.3084)
Kurtosis	3.4815	4.3368	7.7034	5.5287	31.0613	16.8194	2.0669
Jarque-Bera	7.0601	11.7294	59.4060	29.9448	1,391.8268	391.5381	1.9291
Probability	0.0293	0.0028	0.0000	0.0000	0.0000	0.0000	0.3812
Sum	(5.1830)	983.3200	882.5838	516.1689	39,256.3671	152,998.9363	294.0000
Sum Sq. Dev.	237.0071	6,517.9351	13,000.9339	18,561.4336	801,565.82	10,940,605	241.8919
	(0.1401)	26.5762	23.8536	13.9505	1,060.9829	4,135.1064	7.9459
Observations	37	37	37	37	37	37	37

Source: Eviews 13, 2024

Figure 5.3: Descriptive statistics Graph



Source: Eviews 13, 2024.

In table 5.5, since the aim is to show the level of linear dependency between financial inclusion index and the independent variables, the Pearson correlation coefficients which vary between +1 and -1 are used. Positive tendency is indicated with the italics being closer to 1; negative tendency is demonstrated with the italics closer to minus 1, while the italics closest to zero reflect non-tendency. The sign of the coefficient reveals the direction of the relationship: With a direct correlation the symbol '+' is used while in an inverse correlation, a '-' symbol is used to indicate it. The equilibrium of Employment on the table is 0.27, which is moderate positive correlation to the Hypothesis- The more the domestic credit expansion, which is brought by the banks of the 15 selected Sub-Saharan African countries the more the Hypothesis is able to support the DCP availability. However, the relationship is a weak positive since correlation estimates of DCP and Bank Competitiveness (BC) are 0.12, meaning that a higher level of banking coverage might also slightly enhance the stock of credit.

These outcomes evidence empirical records von slicked by Alex and Anthony (2016) when analyzing the AfDB's survey of FI in Africa in 2012. From this survey the proportion of the adult population who have a right formal financial account access was 42 % of the amount found in Kenya. The lowest two ratios are from Cameroon at 20% and Botswana at 17% while Rwandan and Burundian ratios are 33% and 7% respectively. But it was the M-Pesa product that was greatly used by the help of Safaricom to enhance the uptake of financial services in Kenya. This success has forced the DFIs to fund Mobile Banking and seized this opportunity to upgrade the quality of the people's financial services all over Africa.

In the same respect, Prabhakar (2019) observed that Kenyan commercial banks have adopted innovative technologies including mobile banking services, electronic system of transferring money, use of internet banking, sale of Automated teller machines services, opening of accounts online. All these technologies have played a valuable contribution in customer acquisition, accumulation of capital, profitability, as the organization's financial performance is affected.

Furthermore, table 5.5 shows a positive significant relationship between FTech and Financial Education (FEDU) ($r = 0.0560$) which implies a strong relationship between financial illiteracy and technology-based bank services. Further results show a slightly higher positive significant relationship between BC and FEDU that is evidence of how more bank concentration can lead to more financial education through more awareness of the people of the benefits of financial inclusion, thereby increasing the level of inclusion in the banking industry ($r = 0.05$). This supported by Olubanjo (2017), stating that financial inclusion means expanding the number of the financial services and products to make them more accessible to people in the community. For instance, extending credit or bank accounts with official financial institutions enables people to save money to accumulate money for investment. Therefore, people still need to be encouraged to adopt banking habits for financial inclusion to be stimulated through programs that ensure access and usage of quality financial goods and services almost in every location, society, below the poverty line, and across gender (Gosavi, 2018).

Therefore, to enhance the drive towards the actualization of financial inclusion targets, suitable action with collaborative organizations in the sub-Sahara Africa countries is required. This would create a higher probability for many people, both in urban and rural areas, to use the formal financial system and in the long run, the various efficiencies would be boosted.

5.4 Unit Root Test

From the results analyzed it was uncertain that the variables are stationary. Thus, to remove the non-stationary problem, the Augmented Dickey-Fuller test was conducted. The analysis showed that all the variables tested in the current study were stationary after first differencing. This allowed us to conduct valid statistical analysis. The absolute values of the ADF test statistics for some of the variables were much smaller than the 5% critical value of -5.914515 and -6.295239, considerably less than the end value of approximately -2.89. Similar results were obtained for BC (-3.887707), and GDP (-3.339067), while FTECH (-1.664267) and E (-0.323257) were higher than the 5% critical value. Also, it was observed that the p-values of FEDU and DCP were equal to zero; therefore, after first differencing, all the variables become stationary. Although, when using GDP with a

p-value of 0.0172, it was also determined that it has stationarity. The current and lagged first differences of the variables in levels are therefore consistent with the findings of all variables are I(1). Despite this, a single first order differencing was enough to make it stationary, thus no second difference was required.

Table 5.7 Panel Augmented Dickey-Fuller test statistic

Variable	ADF critical value	ADF Test statistics	ADF Test	P-value integration	Order of lags	ADF
FIINDEX	5% level	2.919952	-3.887707	0.0041	I(1)	1
FTECH	5% level	-2.915522	-1.664267	0.4435	I(1)	1
FEDU	5% level	-2.908420	-5.914515	0.0000	I(1)	1
GDP	5% level	-2.908420	-3.339067	0.0172	I(1)	1
E	5% level	-2.917650	-0.323257	0.9140	I(1)	1
DCP	5% level	-2.908420	-6.295239	0.0000	I(1)	1
BC	5% level	-2.919952	-3.887707	0.0041	I(1)	1

Source: Extracted from Eview, 9, 2024

Table 5.8: Panel unit root test: Summary

Series: Variables used for FIIndex - ATMU, BANKB, Borrow FFFI AGE15, FI Account AGE 15, Made Dig Payment Age 15, Owns Credit Card Age 15, Owns Debit Card Age 15, Rec Dig Payment Age 15, Rec Wages in Acc. Age 15, Saved at Finl Age 15				
Date: 12/07/24 Time: 05:26				
Sample: 1 145				
Exogenous variables: Individual effects				
Automatic selection of maximum lags				
Automatic lag length selection based on SIC: 0				
Newey-West automatic bandwidth selection and Bartlett kernel				
Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-5.0960...	1.73449...	10	990
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-8.8413...	4.72722...	10	990
ADF - Fisher Chi-square	127.925...	9.54160...	10	990
PP - Fisher Chi-square	128.846...	6.41303...	10	990
** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.				

Source: Eviews 13, 2024.

From the group unit root summary in table 5.8, the null hypothesis assumes the presence of common unit root in the process.

5.5. Residual Cross-sectional Test

The cross-sectional residual dependence test in Table 5.9 below indicated the P-values for the three LM tests, with two at 0.0000. Therefore, cross-sectional dependency is obvious from two out of the three and Pesaran CD test is said to be significant when T is lesser (Pesaran and Smith, 1995). Proving this current study to be in order with T=10.

Table 5.9: Residual Cross-sectional Test

Test	t-statistic	P-value	Conclusion
Breusch-Pagan LM H_0 : No cross-section dependence in residuals. H_1 : Cross-section dependence present in residuals.	693.7542	0.0000	Null hypothesis rejected, concluding the presence of cross-section dependence in the model residuals.
Pesaran scaled LM H_0 : No cross-section dependence in residuals H_1 : Cross-section dependence present in residuals	20.01981	0.0000	Null hypothesis rejected and cross-section dependence concluded present in the model residuals.
Pesaran CD Test H_0 : No cross-section dependency in residuals H_1 : There is cross section dependence in residuals.	8.835233	0.499.	Null hypothesis cannot be rejected and conclude no cross-sectional dependence in the model residuals.

Source: Extracted from eviews 13, 2024.

5.6 Diagnostic Test

Model specifications are checked by using diagnostic tests and this is provided in the attached appendix 9. The J-statistics suggest the model over identifying restrictions are valid, thereby affirming the instruments used. For the second-order serial correlation, the Arellano-Bond test was used, and the results suggest that there is no second-order serial correlation hence making the models robust. However, first-order serial correlation is quite

high, common characteristic of GMM estimator, as reflected from the financial inclusion model. Although the model is statistically sound, some of the variables are insignificant, and hence there might be certain limitations in the theoretical framework used in the research work; there is a requirement for modifying at least some of the model assumptions or adding more variables to the analysis. These findings clearly point out the fact that there could be other influencing factors that contribute towards individual's financial inclusion, which may not produce significant and optimized results unless there is conducive macroeconomic and policy environment in the region.

More also, the model is quite significant as the R^2 is far from 1 and as a rule of thumb in checking the statistical validity of a model and this model is significant at 0.434, because of this we can say that four of the variables used as determinant of financial inclusion in the sub-Saharan Africa can determine financial in the region and these variables are domestic credit to private sector, financial education, financial technology and the level of employment.

5.7 Normality Test

To assess the normality of the residuals, we employed the Jarque-Bera (JB) test. This test, which relies on the OLS residuals, is an asymptotic test that evaluates skewness and kurtosis. The JB test statistic follows a chi-square distribution with two degrees of freedom (Gujarati, 2004).

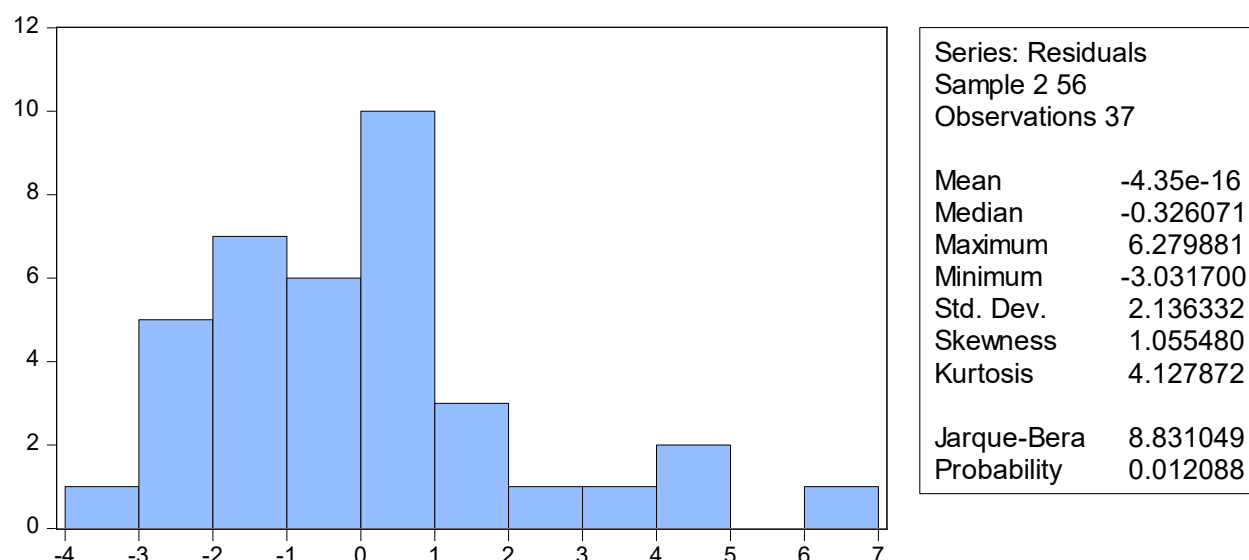
Hypothesis

H0: $B_0 = 0$ (The error term does not follow a normal distribution)

H1: $B_1 = 0$ (The error term follows a normal distribution)

The null hypothesis of lack of normality is rejected at the 5% significance level if the calculated test statistic exceeds the critical value. Thus, at 5% level of significance, we can accept the alternative hypothesis that the error term follows a normal distribution since the p-value from figure 5.4 below is 0.012088.

Figure 5.4: Normality Test



Source: Eview 13, 2024.

5.8 Results Presentation and Discussion of Results

This section reports the results of the GMM model specified by Arellano and Bond (1991). The GMM model builds on the idea that first differences of the instrumental variables to be orthogonal to fixed effects thus enables the use of more instruments and increases efficiency. According to Roodman (2006), difference and system GMM estimators are suitable for ‘small T, large N’ panel data where T may be small because the independent variables are likely not strictly exogenous and may likely have heteroscedasticity and autocorrelation within individual samples, as in the case of the banks studied in this study.

5.8.1 GMM Model Specification

GMM Estimation Equation: $FIINDEX = C(1)*FTECH + C(2)*LFEDU + C(3)*GDP + C(4)*LE + C(5)*LDCP + C(6)*LBC + C(7)$
(5.1)

Substituted Coefficients: $FIINDEX = 0.080910529172*FTECH + 0.44697472657*LFEDU - 0.00474553277074*GDP - 0.667029472852*LE + 0.849276438097*LDCP + 0.12663496984*LBC - 5.60346019258$
(5.2)

Table 5.10: GMM Result

Dependent Variable: FIINDEX				
Method: Generalized Method of Moments				
Date: 12/07/24 Time: 04:09				
Sample (adjusted): 2 64				
Included observations: 38 after adjustments				
Linear estimation with 1 weight update				
Estimation weighting matrix: HAC (Bartlett kernel, Newey-West fixed bandwidth = 4.0000)				
Standard errors & covariance computed using estimation weighting matrix				
Instrument specification: FIINDEX FTECH LFEDU LGDP LE LDCP LBC C				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
FTECH	0.080911	0.022437	3.606186	0.0011
LFEDU	0.446975	0.199079	2.245217	0.0320
GDP	-0.004746	0.013251	-0.358130	0.7227
LE	-0.667029	0.164599	-4.052452	0.0003
LDCP	0.849276	0.254659	3.334960	0.0022
LBC	0.126635	0.927911	0.136473	0.8923
C	-5.603460	4.316675	-1.298096	0.2038
R-squared	0.433971	Mean dependent var		-0.101331
Adjusted R-squared	0.324417	S.D. dependent var		2.442638
S.E. of regression	2.007699	Sum squared resid		124.9565
Durbin-Watson stat	0.520731	J-statistic		6.267806
Instrument rank	8	Prob(J-statistic)		0.012295

Source: Source: EViews 13, 2024

The findings outlined in table 5.9 above offer the basis for recognizing the correlation between the explanatory variables and the expected financial inclusion outcome in SSA in the model.

Table 5.11: Results of findings from the Analysis of Financial Inclusion in SSA

Variable	FI Model
LDCP	0.8492 (0.0022) ***
LFEDU	0.447 (0.0320) **
GDP	-0.0047 (0.7227)
FTECH	0.0809 (0.0011) ***
LE	-0.6670 (0.0003) ***

LBC	0.1266 (0.8923)
C	-5.6035 (0.2038)
J-statistic	6.2678
Prob(J-statistic)	0.0123
R^2	0.4340
Adjusted R^2	0.3244
Observation after adjustments	38
Countries	15

Source: Extracted from Eview 13, 2024.

The domestic credit to the private sector (DCP) is highly significant with a prob-value of 0.0022 which put the significance level between domestic credit to the private sector (DCP) and financial inclusion at 1%, and t-statistics of approximately 3.335, indicating a critical role of this variable serving as a determinant of financial inclusion within the current context and by implication, more domestic credit will result in more financial inclusion. That is, as domestic credit to private sector increases in the SSA region, financial inclusion will also increase leading to more inclusion in the region. This holds true and in consonance with Oyelami, Saibu and Adekunle (2017) suggesting that credit deepening to the private sector can attract more people to the financial sector services, thereby improving financial inclusion significantly. Infact, there is almost a consensus in this regard in the literature with almost no exception to the fact that domestic credit to private sect foster financial inclusion (Mhlanga & Dunga (2020, Evans (2016) and Yakubu et al. (2017).

Also, the financial education in the region (FEDU) primarily reflects a significant and positive correlation in the determination of financial inclusion in SSA with a prob-value of 0.0320 and a t-statistics of 2,2452 respectively. This means that more financial education can lead to more gains in the determination of financial inclusion in the region. As people become more aware of financial matters, the more they will be positioned to take advantage of the benefits financial inclusion provides. This can particularly improve the quality dimension of financial inclusion when people have better knowledge of financial issues. This is in line with Soumaré et al. (2016) view among others (Swiecka et al., 2019),

Xiao, (2016) and Hasan, Le and Hoque, (2021) which found that financial education promotes financial inclusion.

Furthermore, a negative and statistically insignificant mean coefficient of GDP is reported in this study, suggesting that GDP may not necessarily drive financial inclusion and looks to be negatively related to financial inclusion. Although this view is upheld by Nwisienyi and Obi (2020) indicating a negative relationship existing between financial inclusion and economic growth in Nigeria. Supported by Chiwira (2021) as well, stating that a negative relationship between financial inclusion and economic growth exists in SADC region (Southern African Development Community). Basically, a blend of results exists on the relationship between Economic growth and financial inclusion. While some maintained a positive relationship like, Sethi and Acharya (2018); Kim et al. (2018); Ain et al. (2020) and Emara & El Said (2021) among others documented a significant positive relationship between financial inclusion and economic growth. But some also acknowledged negative relation like this study submitted (Menyelim et al. (2021), Maune (2018), Nwisienyi and Obi (2020).

Meanwhile, based on the probability value of Financial Technology (FTECH) (0.0011), demonstrating an extremely positive impact on financial inclusion, which is a shared view in the literature in line with the review done by Kouladoun et al., (2022) financial technology and financial inclusion, in which it was submitted that countries can facilitate access to financial services by encouraging innovative use of technical expertise and financial technology; but cautioned, the use of technology can be fraught with risks and could be costly. Kanga et al., (2021) added that nations' investment in human and fixed capital as well as its economic growth can be enhanced in the long run through a blend of financial technology and financial inclusion While Tian and Kling (2021) submitted that the face of financial services have been changed in recent times on account of advancement in technology; stating that financial services is now trailed with new entrants to the market by non-banks and promoting high competition in the sector.. This means that advancement in technology plays an important role in determining the inclusion of more people in the formal financial sector so as to achieve more financial inclusion in the

region under review. This is apparent because people need technological know-how to take advantage of the diverse products and services available for them, thereby improving the extent of inclusion in the area.

In addition, the Employment (E) in the model appears to be the most significant looking at the p-value at less than 1% and the t-statistics being -4.0524. Although, the t-statistics have a negative sign which may be due to the variable used in measuring the level of employment. But despite this, the variable is statistically significant looking at the probability value. Hence, statistically it can be concluded that the extent of employment in the SSA has a positive impact in the determination of financial inclusion in the region. This view is supported by Peria et al, (2016) stating that income level which is a function of employment has been noticed to be among factors acknowledged empirically to have impact on the inclusivity level in the financial system. Thus, being wealthy was upheld as a factor that can compel people to utilize the formal financial services. In addition, in a study on drivers of FI in Southern Africa, Mhlana and Denhere (2021) found total salary as a proxy of income among variables that significantly has positive effect on FI. They pointed out that financial service providers need to design product and service tailored specifically to meet the needs of the youths, women, Black Africans and Coloureds; and concluded thereafter that, African governments need to encourage this group to take advantage of financial products and services, to improve FI among them.

Lastly, the analysis in this study showed an insignificant relationship existing between bank concentration and financial inclusion, with the result from the analysis having a very low coefficient at 0.166. Which is quite low and implies that bank concentration does not affect financial inclusion. Although, this is contrary to Owen and Pereira, (2018) submission that increasing banking concentration engenders more access formal financial services which they said is enhanced by increase in loans provided and deposit accounts, claiming that countries with wider scope of reach will experience more rapid financial inclusion.

5.9 Conclusion

The focus of this chapter was on analysis, interpretation, discussions and the interpretation of results. The chapter considered the need for the composition of the

dependent variable of the model, and this was achieved through the instrumentality of the principal components analyses to preserve the variance composition of the PCs and the evaluation of the selection process as well as the formation of the component was examined. After this, the model was specified and GMM was used to estimate the model. The findings from the analysis showed that a strong correlation exists between DCP and financial inclusion at 1% level of significance, by implication, to increase the financial inclusion drive, attempts must be made at increasing flow of domestic credit to the private sector. Also, financial education was found to be relatively significant at 5% level of significant with the index of financial inclusion, meaning improving FEDU can increase financial inclusion as well.

In addition, financial technology was also found to be extremely correlated to financial inclusion at 1% probability and the t-test is also high at over the coefficient of three. Thus, in the bid to get more people included in the financial system, technological transformation must take place in the financial sector and programs must be considered at encouraging the masses in embracing financial technologies. Lastly, on account of variables that were found to be significant in the study, the level of employment appeared to be most significant from the analysis in this study and for the goal of financial inclusion to be achieved in the sub-Saharan countries, there is need for the level of employment to be given serious attention role players in the control of financial systems and strictures. However, both GDP and bank concentration were found to be insignificant from the analysis conducted in this study.

CHAPTER SIX

SUMMARY, CONCLUSIONS AND POLICY RECOMMENDATIONS

6.1 Introduction

This chapter states the summary of the study and reviews the overview of findings, policy recommendations, and limitations of the study and areas for further research.

6.2 Summary of the Study

This study comprises six chapters. Chapter one of this study consists of Introduction and background: Financial inclusion explained by different authors, Yanina, Loktionova, & Egorova (2020); Mostafa, Ashraf & Marwa (2023) define financial inclusion as a driver of economic development in the Sub-Saharan Africa countries. Chapter one also presented a study by Omar and Inaba (2020) who regard the financial inclusion as a proactive tool for growth, employment, output, income security, income parity and poverty eradication. The statement of problem is mostly directed towards the problems and the existing gaps in the financial inclusion of the selected Sub-Sahara countries. The purpose of this study is to explore trends in the determinant factors of Financial Inclusion in the Sub-Saharan Africa countries. Furthermore, while analyzing the drivers (determinants) of financial inclusion in the Sub-Saharan Africa countries and as a result of the empirical assessment of the current study, real-life implementation strategies were identified, and policy recommendations are provided to the policy makers and financial practitioners regarding the enhancement of the actualization of financial inclusion in the Sub-Saharan Region.

Chapter two of this study delved into the analysis of trends to identify the determinants of the financial inclusion in Sub-Saharan Africa. The region is divided into four main sub-regions: Sub-Saharan, which is West Africa, Central Africa, East Africa and Southern Africa. For instance, the West African region has Nigeria, Ghana, Senegal, and Côte d'Ivoire, while central African has Democratic Angola, Republic of Congo, Cameroon, Gabon and others. Some of the countries in East Africa are Kenya, Ethiopia, Uganda and others; but in Southern Africa the countries include South Africa, Namibia, Botswana Zimbabwe and many more. This section surveyed the background of financial inclusion and analyses factors affecting FI in these regions.

In chapter three of this study, the literature is reviewed. This study established that FI entails the provision of financial services to the population at reasonable prices and rates. This complied with the right of a customer to receive banking services, such as credit, savings products as well as other financial solutions in a non-discriminatory manner. However, in the last two decades, FI has turned into the core of development policy thanks to its ability to promote fairer economic growth. This shift of focus is, however, occasioned by a number of factors such as global policies such as the World Bank aiming at attaining universal financial access by the year 2020. Furthermore, FI is getting strong consideration as one of the most important enablers of inclusive growth because people and businesses with access to financial services become more engaged and effective players in the economy. It is for this reason that there is a need for policymakers to have adequate knowledge of the facets of FI to develop rightful measures that will help in ensuring that financial inclusion remains a priority, hence encouraging more of the citizens to embrace and use financial services.

This study also went a notch higher in establishing that financial inclusion (FI) is one of the most promising ways of spurring growth of economy and poverty alleviation. Financial inclusion is a way that helps people and companies to develop successful long-term strategies, engage in value creation, and manage financial risks. It is also thought that with FI there is improvement in economic growth, poverty eradication and macroeconomic stability. Nevertheless, quantifying FI and the result from its application still poses a challenge. Although the situation has improved in the past few decades, especially within the emerging markets, there still exist major deficits in the subject. Based on the above global understanding, low and middle-income countries especially within African regions are still far off average when it comes to account ownership in the financial institutions. This underscores the call for further synergies to strive for getting more numbers of people to be financially included, tying it to the improvement of the ranking for financial deepening.

The chapter four of this study employs a rigorous research methodology to systematically investigate financial inclusion in Sub-Saharan Africa, specifically in Angola, Kenya, Cameroon, South Africa, Rwanda, Namibia, Togo, Gabon, and Zimbabwe. The

methodology includes research philosophy, research design, research approach, and study selection. This study considers target population, sampling method, sample size, inclusion and exclusion criteria, model specification, variable definition, and expected priori. Additionally, the study establishes the validity and reliability of the research instruments and adheres to ethical guidelines.

Chapter five focused on the estimations, analysis, interpretation and the presentation of the results and findings on the determinants of financial inclusion in Sub-Sahara countries, using econometrics technique through EViews to examine the causality between the dependent variable (financial inclusion index and the independent variables (FTECH, FEDU, GDP, E and BC) and the Augmented Dickey-Fuller (ADF) test was also applied in this study on the level of panel data to test for the stationarity of the data. The study employed the generalized method of moments (GMM) regression to ascertain the short-run and long-run impact of these independent variables on GDP.

6.3 Overview of Findings

The findings from the tests are summarized below.

1. All the variables under analysis, FTECH, FEDU, E, DCP, BC, and GDP, obtained the order of $I(1)$ at the first difference, as evidenced by the ADF test results which were less than the corresponding 5% critical values. This means that just differencing the data once was enough to make it stationary to pass the Augmented Dickey Fuller tests. All the p-values recorded for the variables were below 0.05, meaning that the null hypothesis of non-stationarity was rejected and therefore the variables are $I(1)$.
2. The GMM regression outcome revealed a key presence of correlation among four out of six variables, which are FTECH, FEDU, DCP and BC with both E and GDP being insignificant. As a result, FTECH, LDCP and LFEDU presented a coefficient with the lowest P-values, <0.001 , implying that all the indexes contribute directly to financial inclusion and could verily serve as critical determinants of financial inclusion. Hence, R-squared slated a good range (0.433971), the model meaning that the model conferred a very high value on the variance of the financial inclusion. Durbin-Watson test statistics indicated that there was no problem of auto

collinearity in the model. The value of J-statistics was checked, and the moment of valid instruments used in the model was also revealed and only GDP and BC showed a non-significant result which might be due to some factors and leads to the consideration of instrument relevance.

6.4 Policy Recommendations

Given the findings, the following policy recommendations are proposed:

1. There is a need to steer policies towards technological infrastructure to enhance financial inclusion.
2. More analysis is needed in regard to the effect of GDP on financial inclusion and promoting policies and incentives related to financial inclusion and banking industry development.
3. There is a need for the government of the 15 selected sub-Saharan countries to invest heavily in quality infrastructure so that in the long run it can improve financial inclusion.
4. Employment generation should be pursued as a policy direction since it facilitates optimum exploitation of the demographic dividend.
5. The 15 selected sub-Saharan countries governmental policies on financial inclusion should impact the economy.

6.5 Limitations of the Study and Areas for Further Research

There are some limitations to the present study, and they are as follows: it should be recognized while the findings are interpreted. First, the coefficient of determination, which is equal to less than one, shows that the model provides inadequate approximation of the variation of financial inclusion. Furthermore, as seen when analyzing the regression results, there is strong evidence of high correlations between most of the independent variables and financial inclusion index. That guaranteed that the model is correctly specified, and the instruments are strong enough. Future work should investigate additional sources of heterogeneity in GDP to understand why it produced a negative result that is negative.

Moreover, since the research work deals with aggregate macroeconomic variables, it managed to fully explain all the disaggregate realities of the real-world business

environment. Further work could be made of the analysis of more detailed data based on, for example, the regional or sectoral approach or including more factors; trade, FDI, and innovation. In addition, based on the recommendations received from examiner 2 on this study when the final submission was made for assessment, the “theory of public good”: could be considered from the point of “government expenditure on education” in the model specification, which might provide an in-depth clue on how government support for literacy could somehow affect or promote financial inclusion.

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Appendix

Appendix 1

Instrument Summary

Equation: Untitled

Number of instruments specified: 8

Instrument specification:

FIINDEX FTECH LFEDU LGDP LE LDCP LBC C

Instruments used (8):

FIINDEX FTECH LFEDU LGDP LE LDCP LBC C

Source: Eview 13, 2024

Appendix 2

Estimation Equation:

=====

$$\text{FIINDEX} = \text{C}(1) * \text{FTECH} + \text{C}(2) * \text{LFEDU} + \text{C}(3) * \text{GDP} + \text{C}(4) * \text{LE} + \text{C}(5) * \text{LDCP} + \text{C}(6) * \text{LBC} + \text{C}(7)$$

Substituted Coefficients:

=====

$$\begin{aligned} \text{FIINDEX} = & 0.080910529172 * \text{FTECH} + 0.44697472657 * \text{LFEDU} - \\ & 0.00474553277074 * \text{GDP} - 0.667029472852 * \text{LE} + 0.849276438097 * \text{LDCP} + \\ & 0.12663496984 * \text{LBC} - 5.60346019258 \end{aligned}$$

Estimation Command:

=====

GMM(INSTWGT=HAC, GMMITER=1) FIINDEX FTECH LFEDU GDP LE LDCP LBC C
@ FIINDEX FTECH LFEDU LGDP LE LDCP LBC C

Source: Eview 13, 2024

Appendix 3

Derivatives of the Equation Specification

Equation: UNTITLED

Method: Generalized Method of Moments

Specification: $RESID = FIINDEX - (C(1)*FTECH + C(2)*LFEDU + C(3)*GDP + C(4)*LE + C(5)*LDCP + C(6)*LBC + C(7))$

Variable	Derivative of Specification
C(1)	-ftech
C(2)	-lfedu
C(3)	-gdp
C(4)	-le
C(5)	-ldcp
C(6)	-lbc
C(7)	-1

Source: Eview 13, 2024

Appendix 4

Wald Test:

Equation: Untitled

Test Statistic	Value	df	Probability
F-statistic	NA	(1, 31)	NA
Chi-square	NA	1	NA

Null Hypothesis: $FIINDEX = C(1)*FTECH + C(2)*LFEDU + C(3)*GDP + C(4)*LE + C(5)*LDCP + C(6)*LBC + C(7)$

Null Hypothesis Summary:

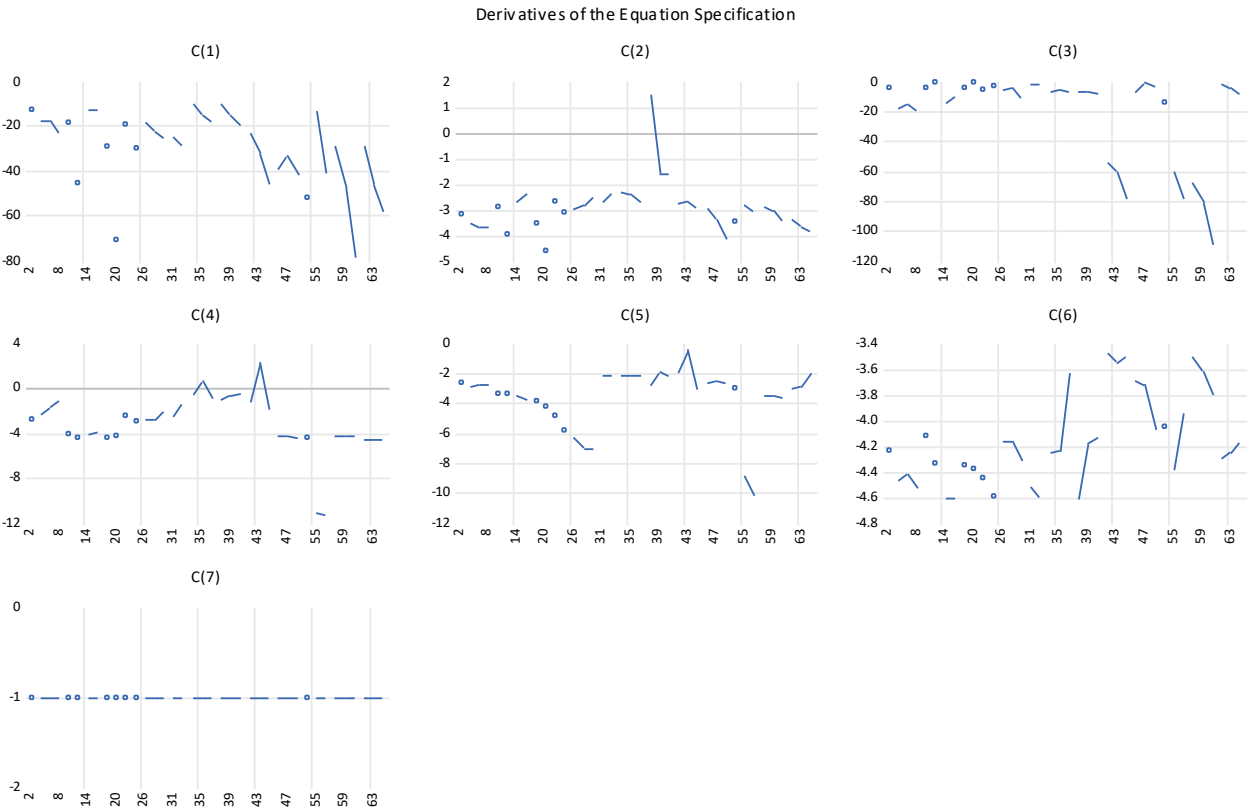
Normalized Restriction (= 0)	Value	Std. Err.
$-C(7) + FIINDEX - C(1)*FTECH \dots$	NA	0.420576

Restrictions are linear in coefficients.

Restrictions evaluated at observation (t = 1)

Source: Eview 13, 2024

Appendix 5



Source: Eview 13, 2024

Appendix 6

Weak Instrument Diagnostics

Equation: Untitled

Cragg-Donald F-stat: 56.17444

Stock-Yogo bias critical values not available for
models with less than 3 instruments.

Stock-Yogo critical values (size):

10%	19.93
15%	11.59
20%	8.75
25%	7.25

Moment selection criteria:

SIC-based: 2.630220
HQIC-based: 3.672252
Relevant MSC: -5.264906

Source: Eview 13, 2024

Appendix 7

Coefficient Confidence Intervals

Date: 12/07/24 Time: 04:39

Sample: 1 145

Included observations: 38

Variable	Coefficient	90% CI		95% CI		99% CI	
		Low	High	Low	High	Low	High
FTECH	0.080911	0.042869	0.118952	0.035151	0.126670	0.019344	0.142477
LFEDU	0.446975	0.109433	0.784516	0.040951	0.852998	-0.099305	0.993255
GDP	-0.004746	-0.027213	0.017722	-0.031771	0.022280	-0.041106	0.031615
LE	-0.667029	-0.946110	-0.387949	-1.002731	-0.331328	-1.118696	-0.215363
LDCP	0.849276	0.417498	1.281055	0.329897	1.368656	0.150482	1.548070
LBC	0.126635	-1.446655	1.699925	-1.765851	2.019121	-2.419591	2.672861
C	-5.603460	-12.92246	1.715543	-14.40738	3.200456	-17.44860	6.241677

Source: Eview 13, 2024

Appendix 8

Endogeneity Test

Equation: UNTITLED

Endogenous variables to treat as exogenous: GDP

Specification: FIINDEX FTECH LFEDU GDP LE LDCP LBC C

Instrument specification: FIINDEX FTECH LFEDU LGDP LE LDCP LBC C

Null hypothesis: GDP are exogenous

	Value	df	Probability
Difference in J-stats	1.305562	1	0.2532

J-statistic summary:

	Value
Restricted J-statistic	7.570665
Unrestricted J-statistic	6.265103

Restricted Test Equation:

Dependent Variable: FIINDEX

Method: Generalized Method of Moments

Date: 12/07/24 Time: 04:32

Sample (adjusted): 2 64

Included observations: 38 after adjustments

Linear estimation with 1 weight update

Estimation weighting matrix: HAC (Bartlett kernel, Newey-West fixed bandwidth = 4.0000)

Standard errors & covariance computed using estimation weighting matrix

Instrument specification: FIINDEX FTECH LFEDU LGDP LE LDCP LBC C
GDP

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FTECH	0.082921	0.022252	3.726460	0.0008
LFEDU	0.452765	0.196150	2.308253	0.0278
GDP	-0.000973	0.012586	-0.077276	0.9389
LE	-0.631453	0.160507	-3.934114	0.0004
LDCP	0.785121	0.247157	3.176613	0.0034
LBC	0.270140	0.908960	0.297197	0.7683
C	-6.196705	4.240481	-1.461321	0.1540

R-squared	0.447013	Mean dependent var	-0.101331
Adjusted R-squared	0.339983	S.D. dependent var	2.442638
S.E. of regression	1.984434	Sum squared resid	122.0774
Durbin-Watson stat	0.557221	J-statistic	7.570665
Instrument rank	9	Prob(J-statistic)	0.022701

Unrestricted Test Equation:

Dependent Variable: FIINDEX

Method: Generalized Method of Moments

Date: 12/07/24 Time: 04:32

Sample (adjusted): 2 64

Included observations: 38 after adjustments

Fixed weighting matrix for test evaluation

Standard errors & covariance computed using estimation weighting matrix

Instrument specification: FIINDEX FTECH LFEDU LGDP LE LDCP LBC C

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FTECH	0.081119	0.020160	4.023736	0.0003
LFEDU	0.447764	0.177219	2.526609	0.0168
GDP	-0.005132	0.011937	-0.429928	0.6702
LE	-0.667950	0.148449	-4.499531	0.0001
LDCP	0.851582	0.230688	3.691489	0.0009
LBC	0.122070	0.831147	0.146869	0.8842
C	-5.590669	3.866598	-1.445888	0.1582

R-squared	0.433503	Mean dependent var	-0.101331
Adjusted R-squared	0.323859	S.D. dependent var	2.442638
S.E. of regression	2.008528	Sum squared resid	125.0597
Durbin-Watson stat	0.520107	J-statistic	6.265103
Instrument rank	8	Prob(J-statistic)	0.012314

Source: Eview 13, 2024

Appendix 9

Instrument Orthogonality C Test

Equation: UNTITLED

Test instruments: LE

Specification: FIINDEX FTECH LFEDU GDP LE LDCP LBC C

Instrument specification: FIINDEX FTECH LFEDU LGDP LE LDCP LBC C

Null hypothesis: LE are valid instruments

	Value	df	Probability
Difference in J-stats	6.267806	1	0.0123

J-statistic summary:

	Value
Restricted J-statistic	6.267806
Unrestricted J-statistic	0.000000

Unrestricted Test Equation:

Dependent Variable: FIINDEX

Method: Generalized Method of Moments

Date: 12/07/24 Time: 04:35

Sample (adjusted): 2 64

Included observations: 38 after adjustments

Fixed weighting matrix for test evaluation

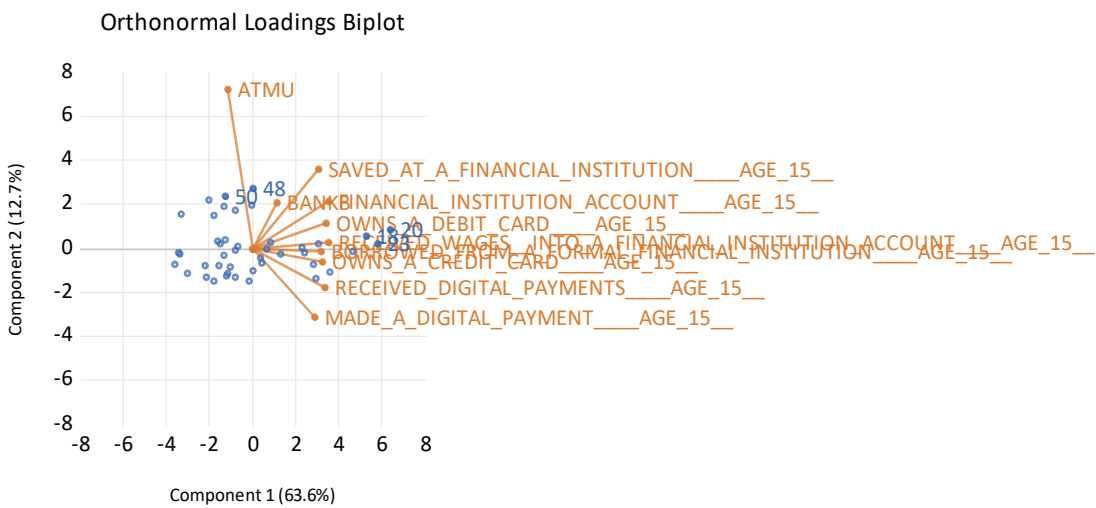
Standard errors & covariance computed using estimation weighting matrix

Instrument specification: FIINDEX FTECH LFEDU LGDP LDCP LBC C

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FTECH	0.135680	0.029820	4.549902	0.0001
LFEDU	1.483930	0.451538	3.286386	0.0025
GDP	-0.004990	0.011969	-0.416924	0.6796
LE	-2.338726	0.684078	-3.418800	0.0018
LDCP	2.267875	0.611537	3.708483	0.0008
LBC	0.005007	0.839506	0.005965	0.9953
C	-9.114657	4.143443	-2.199779	0.0354
R-squared	-0.845777	Mean dependent var	-0.101331	
Adjusted R-squared	-1.203024	S.D. dependent var	2.442638	
S.E. of regression	3.625508	Sum squared resid	407.4735	
Durbin-Watson stat	0.633730	J-statistic	0.000000	
Instrument rank	7			

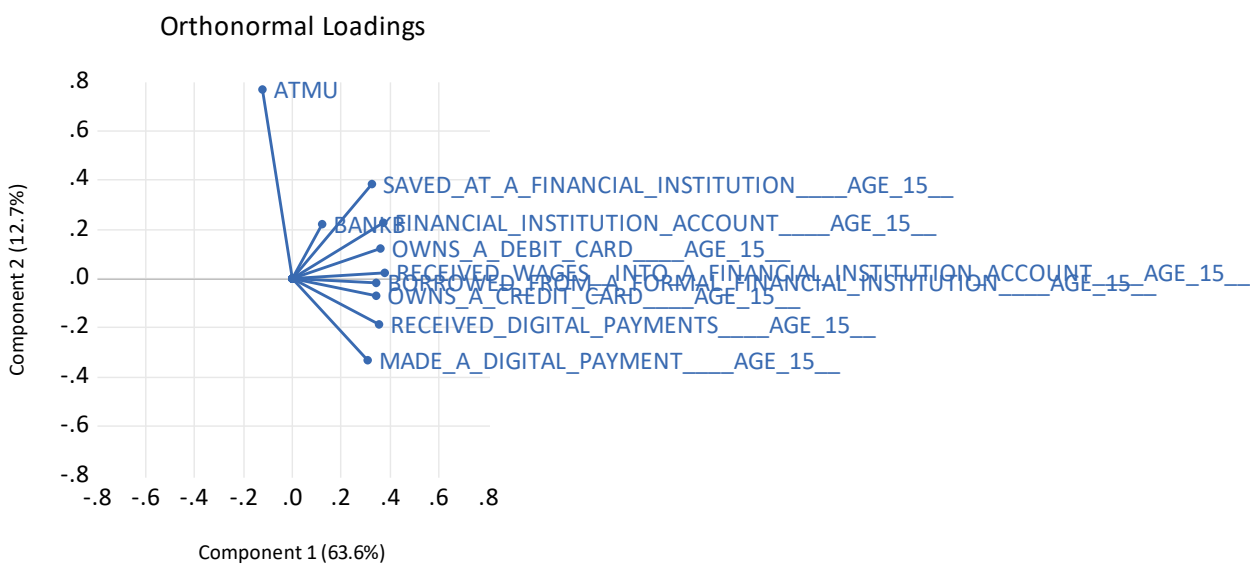
Source: Eview 13, 2024

Appendix 10



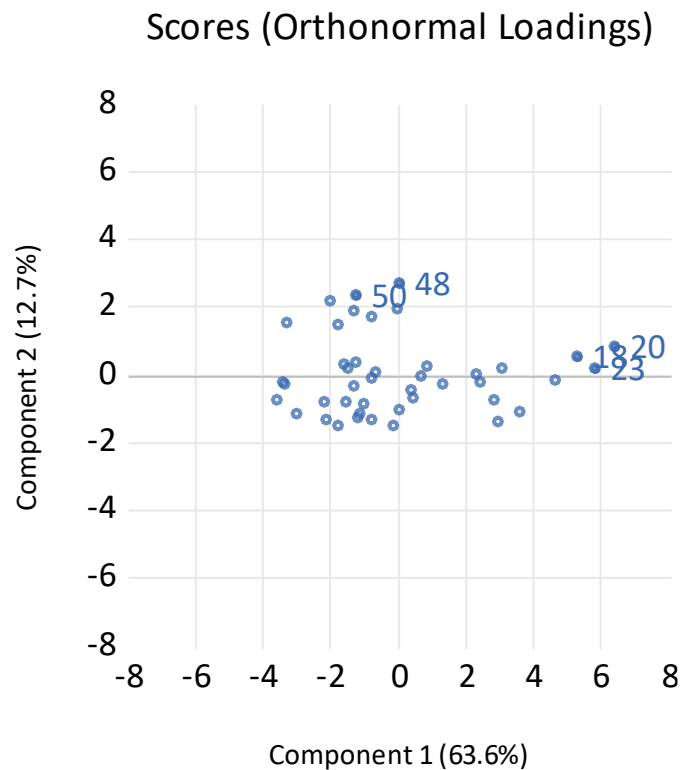
Source: Eview 13, 2024

Appendix 11



Source: Eview 13, 2024

Appendix 12



Source: Eview 13, 2024

Appendix 13

Residual Cross-Sectional Dependence Test

Null hypothesis: No cross-section dependence in residuals

Equation: Untitled

Periods included: 10

Cross-sections Sample: 37

Included observations after adjustments: 264

Note: non-zero cross-section means detected in data

Test employs centered correlations computed from pairwise samples

Test	Statistic	d.f.	Prob.
Breusch-Pagan LM	693.7542	252	0.0000
Pesaran scaled LM	20.01981		0.0000
Pesaran CD	8.835233		0.4990

Source: Eview 13, 2024

Appendix 14

Data

Country	Year	FIINDEX	FTech	FEdu	GDP	E	DCP	BC
Angola	2011	NA	12,6	13,7	3,4721	14,3261	12,74	2,00
	2014	-0,656713	12,5	24,5	4,8226	15,7719	14,38	6,00
	2017	NA	17,7	34,5	-0,1471	14,1422	12,84	8,00
	2021	NA	19,5	41,8	1,1992	14,2272	10,5	10,00
Gabon	2011	NA	9,9	23,6	18,21031	15,1099	10,36	4,00
	2014	-0,783255	17,8	34,9	18,20397	10,1488	18,67	6,00
	2017	0,005338	17,5	40,5	14,92949	5,1099	16,12	9,00
	2021	-0,127241	22,9	40,5	20,21795	2,7257	15,16	11,00
Cameroon	2011	NA	18,5	14,87	3,4721	65,3	29,22	6,00
	2014	-3,334174	18,25	17,75	4,8226	63,8	27,75	8,00
	2017	-1,627792	22,25	25,45	-0,1471	68,4	35,38	10,00
	2021	-1,122856	45,15	51,55	1,1992	76,6	30,72	10,00
Chad	2011	NA	9,5	13,47	12,17231	34,6	16,78	3,00
	2014	-3,619966	12,6	14,82	13,94077	56,7	34,67	3,00
	2017	-3,014416	12,9	10,14	10,00039	47,92	40,12	4,00
	2021	-2,162675	20,1	11,19	11,77998	55,78	41,41	4,00
South Africa	2011	NA	19,2	19,15	3,4721	78,58	42,31	5,00
	2014	5,287622	29,13	34,14	4,8226	77,39	48,45	5,00
	2017	3,090426	45,92	57,05	-0,1471	76,01	50,61	5,00
	2021	6,393768	70,5	97,55	1,1992	71,23	66,34	5,00
Namibia	2011	NA	23,1	-17,77	5,0913	16,57	39,76	6,00
	2014	2,312165	19,5	14,96	6,0925	11,36	121,14	9,00
	2017	5,831343	24,5	13,36	-1,0273	12,76	309,02	9,00
	2021	4,645197	29,5	22,17	3,6038	17,92	321,38	11,00
Botswana	2011	NA	17,5	17,08	6,84	12,72	241,69	4,00
	2014	2,451932	18,6	18,82	5,69	15,78	552,39	4,00
	2017	0,690533	22,1	16,9125	4,11	15,28	1 152,80	4,00
	2021	1,342038	24,5	11,5065	11,92	6,58	1 108,39	4,00
Lesotho	2011	NA	19,4	11,3091	2,57941	12,28	783,12	4,00
	2014	NA	23,5	17,1776	2,441063	3,67	1 242,30	6,00
	2017	-1,241478	24,6	14,6903	2,306742	11,83	8,86418137	7,00
	2021	0,829955	28,7	10,3532	2,406781	3,82	8,95079214	9,00
Benin	2011	NA	12,5	12,6328	2,9638	4,02	8,73664995	9,00
	2014	-3,305493	10,6	10,4749	6,3577	1,77	8,74989096	11,00
	2017	-1,047883	14,9	10,5997	5,6716	0,52	8,58035577	11,00

	2021	-1,765005	17,5	15,1043	7,1555	2,72	8,68834914	11,00
Togo	2011	NA	9,1	5,9067	5,422442	2,23	8,74913917	5,00
	2014	-3,437825	10,5	0,2323	6,393318	2,58	15,3291557	8,00
	2017	-1,329875	14,7	5,1211	6,387423	1,85	6,43851653	9,00
	2021	-1,57299	19,6	4,9677	8,342244	1,56	8,0369251	10,00
Ghana	2011	NA	16,8	4,2135	39,33667	2,33	8,00565592	4,00
	2014	-1,491002	23,3	15,1142	54,78332	3,02	6,67133539	7,00
	2017	0,357829	32,5	14,8466	60,40592	0,1	1,61686895	8,00
	2021	0,417011	45,9	17,5905	79,52442	6,6	23,56	10,00
Nigeria	2011	NA	17,9	14,8466	5,31	67,5	11,04	5,00
	2014	-0,041386	38,5	19,04	6,31	67	13,3	8,00
	2017	-0,761639	33,26	29,12	0,81	71,75	12,85	9,00
	2021	0,001087	41,8	65,14	3,65	80,85	13,45	13,00
Rwanda	2011	NA	21,13	15,34	-62,1	77,5	13,1	5,00
	2014	-1,280716	34	23,73	-24	79,5	17,4	8,00
	2017	-1,297573	51,46	31,25	13,7	80,4	20,4	10,00
	2021	NA	59,03	11,32	13,0262	81,5	25,3	10,00
Ethiopia	2011	NA	11,4	10,19	39,33667	5 083,9	87,8	3,00
	2014	NA	15,5	14,89	54,78332	14748,3	286,6	6,00
	2017	-2,010986	13,8	16,75	60,40592	71461,7	6 922,60	8,00
	2021	-1,806258	41,5	20,69	79,52442	80414,1	28 146,00	10,00
Kenya	2011	NA	10,76	14,55	46,86947	73,9	34,16	
	2014	2,83	29,16	17,75	68,2858	75,4	34,2	
	2017	3,57	47,62	20,45	82,03651	67,1	34,57	
	2021	2,93	78,5	31,35	109,7037	69,6	35,65	
Zimbabwe	2011	NA	28,6	16,5	14,62	94,6	19	
	2014	-2,12	28,6	29,75	1,48	95,2	19,2	
	2017	-0,81	46,48	39,47	4,08	92,6	16,9	
	2021	-1,22	58,3	45,67	8,47	90,6	7	

Source: Compiled by the author