THE NEXUS BETWEEN FINANCIAL INCLUSION, FINANCIAL STABILTY AND ECONOMIC GROWTH IN SUB-SAHARAN AFRICA

By

MESHESHA DEMIE JIMA

Thesis submitted in accordance with the requirements for the degree of

Doctor of Philosophy in Management Studies

in the subject

Finance, Risk Management and Banking

at the

UNIVERSITY OF SOUTH AFRICA

SUPERVISOR: PROF. PATRICIA LINDELWA MAKONI (PhD)

(February 2023)

DECLARATION

I, ***Meshesha Demie Jima***, hereby declare that this dissertation is my own work, except where otherwise indicated and acknowledged, and prepared in accordance with the University's regulations and code of practice for the research degree programmes. It is submitted for the degree of Doctor of Philosophy (PhD) at the University of South Africa (UNISA). This thesis has not, in part or wholly, been submitted to acquire any other academic award or examination to any other universities.

Signature of the Candidate:

Name of the Candidate: Meshesha Demie Jima

Student Number: 10164154

Date: 03 February 2023

ACKNOWLEDGEMENTS

First of all, I would like to thank the Almighty God, the most generous and merciful to this world, for giving me the wisdom, strength and courage to pursue and complete this PhD programme, "*For Nothing is Impossible with God* (Luke 1:37)". Secondly, I wish to express my deepest gratitude to my academic supervisor at the University of South Africa, Professor Patricia Lindelwa Rudo Makoni (PhD), for her professional and valuable support, enthusiasm, consistent follow-up, encouragement and guidance throughout this PhD journey; without her intellectual and insightful critiques and valuable advices, it would have been challenging to complete this thesis in time. Thirdly, I wish to acknowledge the insightful comments, professional language editing and guidance of Yishak Mengesha (Mr.), Kagnew Wolde (PhD), Mehret Alazar (Miss.) and Abebaw Kassie (PhD). I want to appreciate their valuable comments, suggestions and consistent encouragements throughout this PhD programme.

I am also indebted to the University of South Africa (UNISA) for the financial support to cover my doctoral study, as well as to undertake the research work. Special thanks also go to the past and current senior management members of the Development Bank of Ethiopia (DBE), and the Commercial Bank of Ethiopia (CBE) for the opportunities I got to work with, and explore the financial sector of Ethiopia as a whole, while understanding the missing link of the business to be addressed through time. Melkam Yitbarek (Miss) and the other staff of the Research and Development Department of CBE are highly appreciated for their support in data management and consistent encouragement during the study. It is also my pleasure to show appreciation to Kesis Solomon Alene (Megabi Tibeb), Yohannes Mengistu (Mr.), Shimelis Alemu (Mr.), Tigist Degefu (Miss), Debebe Feyisa (Mr.), Yirgalem Kebede (Mrs.), Mesfin Fikre (PhD), Temesgen Busha (Mr.), Tewodros Hailu (Mr.), Biruk Shiferaw (Mr.), Marta Zewude (Mrs.), Teferi Zebene (Mr.), Teferi T/Mariam (Mr.), Abraham Mengistu (PhD), Shambel Astatike (Mr.), Selamawit Tilahun (Miss), Wondosen Tolosa (Mr.) and Asnake Siyum (Mr.) for their encouragement and consistent support during the research work. It was your moral support and encouragement that carried me through the difficult times of my doctoral journey.

Last but not least, I would like to express my gratitude to all my former teachers, mentors and colleagues at various levels, including classmates and friends for shaping me in terms of my

academic and social life and help achieve my personal and professional goals. I am also grateful to all my biological and spiritual families, including brothers and sisters. You have been my promoter and supporter throughout my academic and regular life. Your constant appreciation, enthusiasm and encouragement have yielded results. It is because of your consistent advice, guidance and appreciation that I reached this milestone in both my professional and educational life, thank you again.

DEDICATION

I dedicate this thesis to my parents, particularly my Mother (Mrs Tiringo Derese) and my late Father (Mr. Demie Jima), who spent their whole life raising their siblings, and equipping them with modern education in order for them to reach the level of their dream. It is because of your continuous encouragement, support and inspiration that I achieved this milestone. Today, I confirm that your long term wishes became a reality, and I am very grateful to your long term dedication and effort throughout my life.

ABSTRACT

Scholars and several global and international development agencies have been advocating the importance of financial inclusion for financial stability, social welfare improvement and sustainable economic growth. Within this general framework, the Sub-Saharan African (SSA) countries have been striving to develop and implement financial inclusion strategies so as to realise stability and sustainable economic growth. However, theories and empirical findings lack consensus on the major drivers of financial inclusion and financial stability. In addition, there are disagreements on the relationships between financial inclusion, financial stability and economic growth, resulting in disparity in the design and application of strategies and policies. The aim of this study is, thus, to examine the key drivers of financial inclusion and financial stability, assess the cointegrating long run relationships, as well as determine the causalities that exist between financial inclusion, financial stability and economic growth for the selected SSA countries for the period of 2000 to 2019. The study used the General Methods of Moments (GMMs) for the dynamic panel data, Autoregressive Distributed Lags (ARDL) for the panel cointegration tests and panel Granger non-causality tests to verify the causation between the variables. Composite indices were developed for the financial inclusion and institutional quality using a Principal Component Analysis (PCA) technique. The results of this study revealed that the lags effect, economic growth, financial stability, financial deepening, inflation, efficiency, profitability and liquidity position found to be important drivers of financial inclusion in the region. On the other hand, financial stability is determined by its lags effect, financial inclusion, institutional quality, digital technology adoption and global financial crises. The study also found that there is a long run relationship between financial inclusion, financial stability and economic growth. Moreover, there is a pairwise bi-directional Granger non-causality between financial inclusion, financial stability and economic growth, in the region, implying possible complementarity. Specifically, economic growth drives both financial inclusion and financial stability in most of the low income SSA countries, whereas financial inclusion promotes financial stability and economic growth for most of the middle income economies. In this study, considering the broad and multidimensional aspects of a financial inclusion, the use of a composite index to assess the interaction between financial inclusion, financial stability and economic growth helped to have a comprehensive picture and address the problems that may arise from the use of individual indicators. The findings of the study further confirmed that both macro and micro economic factors are important drivers of financial inclusion and financial stability. In addition, there are joint and separate causalities between financial inclusion, financial stability, and economic growth, and hence the SSA countries should follow a holistic approach, and develop and implement policies and strategies that ensure inclusive and sustainable growth. In addition, the adoption of

financial regulations should consider the synergy between financial inclusion, financial stability and economic growth. Thus, policy makers, government advisors and financial sector regulators should not trade-off between the financial inclusion, stability and economic growth while adopting strategies and policies in the region.

Key words: *Financial Inclusion, Financial Stability, Economic Growth, Sub-Saharan Africa, Principal Component Analysis, Panel Unit Root Test, Panel ARDL Cointegration Test, Panel Granger non-causality Test*

Isifinqo

Izazi kanye nama-ejensi amaningana entuthuko emhlabeni jikelele nakwamanye amazwe bebekhuthaza ukubaluleka kokufakwa kwezimali ukuze kube nokuzinza kwezezimali, ukuthuthukiswa kwezenhlalakahle kanye nokukhula komnotho okusimeme. Ngaphakathi kwalolu hlaka olujwayelekile, amazwe ase-Afrika eseNingizimu ne-Sahara (aziwa ngokuthi yi-SSA) abezama ukuthuthukisa nokusebenzisa amasu okufakwa kwezimali ukuze afezekise ukusimama nokukhula komnotho okusimeme. Kodwa-ke, amathiyori kanye nokutholwe okunamandla akunakho ukuvumelana ngezimbangela ezinkulu zokufakwa kwezezimali nokuzinza kwezezimali. Ukwengeza, kunokungaboni ngaso linye ngobudlelwano phakathi kokufakwa kwezimali, ukuzinza kwezezimali kanye nokukhula komnotho, okuholela ekuhlukeni ekuklanyweni nasekusetshenzisweni kwamasu nezinqubomgomo. Ngakho-ke, inhloso yalolu cwaningo ukuhlola izici ezibalulekile zokufakwa kwezimali nokuzinza kwezezimali, ukuhlola ubudlelwano besikhathi eside, kanye nokuthola izizathu ezikhona phakathi kokufakwa kwezimali, ukuzinza kwezezimali kanye nokukhula komnotho emazweni akhethiwe e-SSA kusukela kuyisikhathi sezi-2000 kuya kwezi-2019. Ucwaningo lusebenzise Izindlela Ezivamile Zezikhathi (IEZ) kudatha yephaneli eguqukayo, eyaziwa ngokuthi yi-Autoregressive Distributed Lags (ARDL) yokuhlolwa kokuhlanganisa kwephaneli kanye nokuhlolwa kwephaneli okungeyona i-Granger Causality ukuze kuqinisekiswe imbangela phakathi kokuhlukahluka. Izinkomba ezihlanganisiwe zenzelwe ukufakwa kwezezimali kanye nekhwalithi yesikhungo kusetshenziswa inqubo Yokuhlaziya Ingxenye Eyinhloko (YIE). Imiphumela yalolu cwaningo iveze ukuthi ukwehla komnotho, ukukhula komnotho, ukuzinza kwezezimali, ukujula kwezimali, ukwehla kwamandla emali, ukusebenza kahle, ukwenza inzuzo kanye nesimo semali kutholwe kuyimbangela ebalulekile yokufakwa kwezimali esifundeni. Ngakolunye uhlangothi, ukuzinza kwezezimali kunqunywa umphumela wokubambezeleka, ukufakwa kwezimali, ikhwalithi yesikhungo, ukwamukelwa kobuchwepheshe bedijithali kanye nezinkinga zezimali zomhlaba wonke. Ucwaningo luphinde lwathola ukuthi kunobudlelwano obude phakathi kokufakwa kwezimali, ukuzinza kwezezimali kanye nokukhula komnotho. Ngaphezu kwalokho, kunembangela ephindwe kabili yokubhanqa okuhlakaniphile engeyona ye-Granger casualty phakathi kokufakwa kwezimali, ukuzinza kwezezimali nokukhula komnotho, esifundeni, okusho ukuphelelisana okungenzeka. Ikakhulukazi, ukukhula komnotho kugqugquzela kokubili ukufakwa kwezezimali nokuzinza kwezezimali emazweni amaningi e-SSA anengeniso ephansi, kuyilapho ukufakwa kwezezimali kukhuthaza ukuzinza kwezezimali nokukhula komnotho kweningi leminotho yabantu abanengeniso yeholo eliphakathi.nendawo. Kulolu cwaningo, kucatshangelwa izici ezibanzi zokufakwa kwezimali, ukusetshenziswa kwenkomba eyinhlanganisela ukuhlola ukusebenzisana phakathi kokufakwa

kwezimali, ukuzinza kwezezimali nokukhula komnotho kusize ukuba nesithombe esibanzi futhi kuxazululwe izinkinga ezingase zivele ekusetshenzisweni kwezinkomba ngazinye. Okutholwe ocwaningweni kuphinde kwaqinisekisa ukuthi zombili izici zomnotho ezinkulu nezincane ziyizici ezibalulekile zokufakwa kwezimali kanye nokuzinza kwezezimali. Ukwengeza, kunezimbangela ezihlangene nezihlukene phakathi kokufakwa kwezimali, ukuzinza kwezezimali, kanye nokukhula komnotho, yingakho amazwe e-SSA kufanele alandele indlela ephelele, futhi athuthukise futhi asebenzise izinqubomgomo namasu aqinisekisa ukukhula okubandakanyayo nokusimeme. Ukwengeza, ukwamukelwa kwemithethonqubo yezezimali kufanele kucabangele ukusebenzisana phakathi kokufakwa kwezimali, ukuzinza kwezezimali kanye nokukhula komnotho. Ngakho-ke, abenzi bezinqubomgomo, abeluleki bakahulumeni kanye nabalawuli bomkhakha wezezimali akufanele bahwebe phakathi kokufakwa kwezimali, ukuzinza kanye nokukhula komnotho ngenkathi besebenzisa amasu nezinqubomgomo kuhulumeni kuyisifunda.

Opsomming

Vakkundiges en verskeie globale en internasionale ontwikkelingsagentskappe verkondig die belangrikheid van finansiële insluiting vir finansiële stabiliteit, verbetering van maatskaplike welvaart en volhoubare ekonomiese groei. Binne hierdie algemene raamwerk streef die sub-Sahara- (SSA-) Afrikalande na die ontwikkeling en implementering van finansiële insluitingstrategieë om stabiliteit en volhoubare ekonomiese groei ’n werklikheid te maak. Teorieë en empiriese bevindings stem egter nie ooreen oor die belangrikste aandrywers van finansiële insluiting en finansiële stabiliteit nie. Daarbenewens is daar meningsverskille oor die verhoudings tussen finansiële insluiting, finansiële stabiliteit en ekonomiese groei, wat ongelykheid in die ontwerp en toepassing van strategieë en beleide tot gevolg het. Die doel van hierdie studie is dus om die sleutelaandrywers van finansiële insluiting en finansiële stabiliteit te ondersoek, die koïntegrerende langtermynverhoudings te assesseer, asook die kousaliteite wat tussen finansiële insluiting, finansiële stabiliteit en ekonomiese groei vir die gekose SSA-lande vir die tydperk 2000 tot 2019 bestaan, te bepaal. Die studie het gebruik gemaak van die Algemene Metodes van Momente (AMM’e) vir die dinamiese paneeldata, Outoregressiewe Verspreide Sloerings (ORVS) vir die paneelkoïntegrasie-toetse en paneel-nie-Granger-kousaliteitstoetse om die kousaliteit tussen die veranderlikes te verifieer. Saamgestelde indekse is ontwikkel vir die finansiële insluiting en institusionele gehalte deur gebruikmaking van ’n Primêrekomponent- (PKO-) ontledingstegniek. Die resultate van hierdie studie het aan die lig gebring dat die sloering-effek, ekonomiese groei, finansiële stabiliteit, finansiële verdieping, inflasie, bekwaamheid, winsgewendheid en likiditeitsposisie belangrike aandrywers van finansiële insluiting in die streek is. Aan die ander kant word finansiële stabiliteit deur sy sloering-effek, finansiële insluiting, institusionele gehalte, aanvaarding van digitale tegnologie en finansiële krisisse bepaal. Die studie het ook bevind dat daar ’n langtermynverhouding tussen finansiële insluiting, finansiële stabiliteit en ekonomiese groei bestaan. Daar is boonop ’n paargewyse tweerigting- nie-Granger-kousaliteit tussen finansiële insluiting, finansiële stabiliteit en ekonomiese groei in die streek, wat moontlike komplementariteit impliseer. Ekonomiese groei dryf spesifiek sowel finansiële insluiting as finansiële stabiliteit aan in die meeste lae-inkomste- SSA-lande, terwyl finansiële insluiting finansiële stabiliteit en ekonomiese groei vir die meeste middelinkomste-ekonomieë bevorder. In hierdie studie, met inagneming van die breë en meerdimensionele aspekte van ’n finansiële insluiting, het die gebruik van ’n saamgestelde indeks om die interaksie tussen finansiële insluiting, finansiële stabiliteit en ekonomiese groei te assesseer, gehelp om ’n omvattende beeld te vorm en die probleme te hanteer wat uit die gebruik van individuele aanwysers kan ontstaan. Die bevindings van die studie het verder bevestig dat sowel makro- as mikro-ekonomiese faktore belangrike aandrywers van finansiële insluiting en finansiële stabiliteit is.

Daarbenewens is daar gesamentlike en afsonderlike kousaliteite tussen finansiële insluiting, finansiële stabiliteit, en ekonomiese groei. Die SSA-lande behoort derhalwe ’n holistiese benadering te volg, en beleide en strategieë te ontwikkel en in werking te stel wat inklusiewe en volhoubare groei verseker. Daarby behoort die aanvaarding van finansiële regulasies die sinergie tussen finansiële insluiting, finansiële stabiliteit en ekonomiese groei te oorweeg. Derhalwe behoort beleidmakers, regeringsadviseurs en finansiëlesektor-reguleerders nie kompromieë aan te gaan tussen finansiële insluiting, stabiliteit en ekonomiese groei wanneer strategieë en beleide in die streek aanvaar word nie.

LIST OF ACRONYMS

In order to familiarize with the different acronyms that are used in the thesis and avoid possible confusion among readers and users, the table below listed-out the various acronyms used and defined each abbreviation as stated below.

Table 1: Acronyms and their definitions

Acronyms	Description
AfDB	African Development Bank
ARDL	Autoregressive distributed lag
AU	Africa Union
BOP	Balance of payments
BRICS	Brazil, Russia, India, China, South Africa
DFE	Dynamic fixed effect
ECT	Error correction term
EG	Economic growth
FEM	Fixed effects model
FI	Financial inclusion index
FDI	Financial development index
FS	Financial stability
GDP	Gross domestic product
GDPPc	Gross domestic product per capita
GMM	Generalised Method of Moments
HC	Human capital
IFS	International Financial Statistics
IMF	International Monetary Fund
INF	Inflation
IQI	Institutional quality index
IR	Interest rate
IPS	Im, Pesaran and Shin
IU	Internet subscriptions

Acronyms	Description
LP	Liquidity position
LLC	Levin, Lin and Chu
MDP	Money demand and productivity framework
MENA	Middle East and Northern Africa
MG	Mean group
MU	Mobile subscriptions
OECD	Organisation for Economic Cooperation and Development
OIC	Organisation of Islamic Cooperation
PCA	Principal components analysis
PCG	Private sector domestic credit to GDP
PMG	Pooled mean group
PP	Phillips-Perron
REM	Random effects model
RGDPG	Real gross domestic product growth rate
SADC	Southern African Development Community
SDG	Sustainable development goals
SSA	Sub-Saharan Africa
UFA	Universal Financial Access
UN	United Nations
USA	United States of America
UECM	Unrestricted error correction model
UNCTAD	United Nations Conference on Trade and Development
USD/ US$	United States dollar
VECM	Vector error correction model
WB	World Bank
WDI	World Development Indicators
WEF	World Economic Forum
WGI	Worldwide Governance Indicators
WTO	World Trade Organization

LIST OF FIGURES

LIST OF TABLES

TABLE OF CONTENTS

CHAPTER ONE: INTRODUCTION

1.1 Background to the Study

Inclusive financial systems have become a key objective on policy agendas around the globe. Modern economic theories advocate the importance of financial inclusion for an inclusive growth (McKinnon, 1973; Shaw, 1973; King and Levine, 1993; Levine, 2004). Inclusive financial system expands the sources of fund, limits informal financial services and promotes investment diversification, which boosts financial as well as economic stability at the time of financial distress (Khan, 2011). As a result, large numbers of developmental financial institutions, such as the World Bank (WB), International Monetary Fund (IMF), and Africa Development Bank (AfDB) have been promoting access to finance as a global policy agenda. Inclusive finance has become critical for financial services to reach the unbanked segments of the society and promote business expansions (Beck, Demirguc-Kunt, and Levin, 2007; Mehrota and Yetman 2015).

An inclusive financial system is an important step to promote resource mobilisation from the surplus economic sectors and channel them to the deficit ones so as to boost the level of investment, stability and thereby economic growth. Stable and well-functioning financial system is necessary to enhance economic activities and promote growth, while unstable financial system impedes economic performance (Somnez and Uysal, 2018; Eweke, 2019). An inclusive financial system enhances the effectiveness of a monetary policy in controlling inflation through expanding its effect to a larger population (Jungo, Mara, and Anabela, 2021). However, it continues to be a challenge for many policy makers and regulators to enhance financial inclusion as the financial losses from the excluded group of the populations are significant.

Various institutions and scholars have attempted to define the term *financial inclusion* in different ways, but there is still no standard and universally accepted definition for the term, due to its multidimensional nature. Khan (2011) expressed financial inclusion as a course of actions to ensure access for formal financial services to all in need including the poor, weaker and disadvantaged people. Hannig and Jansen (2011) described financial inclusion as the absence of financial and non-financial barriers to access financial services. Sarma (2012) referred to financial inclusion as a process which enables every member of a country to be part of the official financial

system. Park and Mercado (2015) averred 'financial inclusion' as "access to financial services at an affordable cost to the unbanked population". The World Bank (2017), on the other hand, considered financial inclusion as a situation wherein households and firms have access to financial products and services – payments, transfers, savings, credit and insurance – that meet their needs with a reasonable cost and delivered in a responsible and sustainable manner. Ozili (2018) is of the view that financial inclusion is simply an easy access and availability of basic financial services to all in need, addressing the interest of those who are excluded from the services due to various reasons. From the definitions above, it is possible to observe a slight variation, which emanated from the context and application of the term financial inclusion. Despite the variations, the above definitions convey almost similar concept.

Financial inclusion incorporates the various aspects of financial products and services that makes finance an important elements of the economy (Beck, Senbet, and Simbanegavi, 2015). International developmental institutions such as the World Bank (WB) and the Africa Development Bank (AfDB) argue that access to important financial services help to promote better-living conditions, including better shelter, health, education, and investment in business. Low access to financial services in most developing economies has limited the scope and ranges of entrepreneurial activities, which has contributed to the slow economic growth (World Bank, 2017; and Africa Development Bank, 2013). This means, it is difficult to realise an inclusive growth in the absence of an inclusive financial system. It is, thus, critical to assess the effect of financial inclusion on the various economic factors so as to raise the awareness of policy makers and strategists, and develop the right mix of policies and strategies.

Studies show that the positive impact of financial intermediation cannot be realised in economies with low level of financial inclusion and weak institutional frameworks (Demetriades and Law, 2006; Jungo *et al.*, 2021). In addition, financial inclusion among low income groups and small enterprises, particularly among those who are unable to expand their investments and undertake financial transactions, is essential for their success (Demirgüç-Kunt and Klapper 2012; Iqbal and Sami, 2017). Such an argument raises the questions of what determines financial inclusion and how institutional factors affect financial inclusion. Siddik, Sun and Kabiraj (2015) listed various indicators of financial inclusion linked to access, availability and usage, and proposed a

comprehensive index for financial inclusion. In this research, inclusive financial system in considered as a system that addresses the interest of all people and encourage the participation of all in the economic growth. Inclusive finance expands the level of day-to-day transactions and management of finances, and limits the growth of informal financial services (Balele, 2019). It also facilitates the efficient allocation of financial resources, and thus reduces the cost of capital. Inclusive financial system is, thus, important to enhance efficiency and welfare and create avenues for a secured and safe financial service.

Financial inclusion may endanger the financial system stability and creates potential risks linked to credit to the low-income individuals and hence policymakers view financial inclusion as one of the drivers of financial stability (Sarma and Pais, 2011; Van *et al.,* 2021). Financial inclusion is critical to realise the main purposes of monetary policy. It has a strong link with financial system stability, income inequality and others, and influences the financial well-being of individual households, enterprises, and the economy as a whole (Alsamara, Mrabet, Jarallah and Barkat, 2019; Jungo *et al.*, 2021; Cihak, Mare, Melecky and Martin, 2021). Since the global financial crisis of 2008, an inclusive financial system has become a strategic priority and policy direction to ensure stable financial system and register sustainable growth (Asongu, 2015). Crockett (1996) linked financial stability with smooth functioning of financial markets and institutions that constitute the financial system.

Literatures show no consensus on the term *financial stability*. The European Central Bank (ECB, 2012) described financial stability as a situation in which the financial system can withstand internal and external shocks without a disruption in the financial intermediations. In this case, a financial system is believed to be stable when it avoids current instability and systemic risks. Systemic risk is a risk of disruption in an entire financial system rather than simply the failure of individual institution. It disturbs the function of a financial system as a whole and the economy if materialised (Gorska and Krzeminska, 2019). Ahmad (2018) expressed a stable financial system as the one that manage financial risks, allocate resources efficiently and eliminate undesirable price volatilities of real or financial assets. Anatolyevna and Ramilevna (2013) expressed the term financial stability as a circumstance in which a financial system is able to absorb financial shocks and ensure proper allocation of resources to viable investments. Financial stability can be

described as the ability of a financial system to resist shocks, and restricts their consequences (Creel, Hubert, and Labondance, 2015). On the basis of the above definitions, it is possible to conclude that financial stability has strong association with financial inclusion; and financial instability leads to a sudden collapse of financial institutions and financial system, which causes economic crises and subsequent destruction.

Financial inclusion has a welfare benefit to households through an inclusive economic growth (Demirgüç-Kunt, Klapper, Singer and Van, 2015). Financial inclusion contributes to economic growth in different ways. Increase access to financial services at a reasonable cost reduces vulnerability of the low income group through improving their living standard. In this case, low-cost credit services to the low income groups promote production activities, leading to more outputs. This value addition at individual level contributes to the national output growth. It also leads to positive changes in the standard of living through raising the income levels of the people (Rajan, 2009; Botev, Egert and Jawadi, 2019; Jungo, Mara, and Anabela, 2022). On the other hand, financial services to the excluded people raises the level of fund in the financial market, which raises the capacity of financial institutions to allocate funds to investment projects, which results in more employment and output, leading to improvement in the distributions of income (Claessens and Perotti, 2007; Zins and Weill 2016; Owen and Pereira 2018). All the above facts show that financial inclusion is important for an economic empowerment of the poor and most vulnerable groups, and achieve an overall economic development.

Financial inclusion is considered as an enabler in most of the UN Sustainable Development Goals (SDGs). In the same manner, the AU Agenda 2063 explicitly stated the importance of financial inclusion for the achievement of the Agendas. Researches also identified financial inclusion as a critical element for the achievement of most of the development goals. Studies on the nexus between financial inclusion and economic growth identified financial inclusion as an important element to ensure broader developments (Zulkhibri, 2016; Makina and Wale 2019; Emara and Said 2021). McKinsey Global Institute (2016) revealed that only digital finance has added USD 3.7 trillion to the GDP of emerging economies and improved the life of billions of people within a decade. Other evidences show that financial inclusion help to create more stable financial systems and mobilise financial resources that help to boost investment and economic growth (Neaime and

Gaysse, 2018; Ahmed and Mallick, 2019; Pham and Doan, 2020).

Financial inclusion may increase or decrease the efficiency and usage of monetary policies so as to achieve its purposes. Socio-economic factors such as per capita income, inflation and educational level determines the performance of an economy. These types of socio-economic factors have significant influence on the financial intermediation functions of financial institutions (Somoye, 2011; Evans and Adeoye, 2016; David, Oluseyi and Emmanuel, 2018). In this case, institutional framework is critical to establish a proper relationship between finance and growth and support the process of policy formulation. Low level of financial inclusion implies limited access and use of financial services. Low of access to finance is one of the key reasons for low economic participation and hence low wealth generation and accumulation, which denies 'financial citizenship' (Dymski, 2005). As such, the poor and low income groups of the society become a victim, and hence a significant barrier to stability and economic growth (Beck, Demirgüç-Kunt and Peria, 2008). Thus, low access and use of financial services may be one of the reasons that contributed to instability, low economic development, and hence requires adequate emphasis.

The 2017 Global Findex Report shows that around one third of the global populations are still outside the financial circle and the situation differs across regions and countries (Global Findex, 2017). On the other hand, poverty reduction and sustainable development require adequate finance, which in turn requires a well-functioning and stable financial system. The United Nations' seventeen (17) Sustainable Development Goals (SDGs) and the African Union's Agenda 2063, which are the frameworks that define the main goals pursued to achieve sustainable development in 2030 and 2063, respectively, mentioned financial inclusion under several parts of their reports. Finance and financial services are cited as critical to realise the different goals of the SDGs and improve the life of the people (United Nations, 2014). The World Bank (2017) also identified financial inclusion as important enabler for at least seven of the seventeen sustainable development goals. Due to the above facts, a large numbers of developing economies have developed and implemented a national strategy for financial inclusion.

Easy penetration, availability and usage of financial services - deposits, credits, payment and insurance - are important to ensure a sustainable growth in the developing countries. Financial inclusion is helpful to mobilize savings and allocate funds into productive sector and avail startup

capital for entrepreneurs and innovative enterprises (Mehrota and Yetman 2015). FI enhances the quality, quantity and efficiency of financial intermediation, which increases saving and investment, thereby economic growth, which in turn improves the life of individuals (Babajide, Adegboye and Omankhanlen, 2015). In doing so, financial inclusion facilitates the efficient and effective allocation of resources and increases the stability and growth of an economy (Han and Melecky, 2013; Ahamed and Mallick, 2019). Financial inclusion also promotes the creation of various monetary products and services, improves the level of risk management, facilitates payments, and easily monitors the status of borrowers and their business. In addition, it provides information and instruments that can help individuals and firms cope with undesirable events, and ensure stable and smooth consumption and investment (IMF, 2016).

Sub-Saharan Africa (SSA) has been one of the developing regions with a consistent high level growth for more than a decade (IMF, 2016). However, a large proportion of the population of the region still lives in extreme poverty. It is also one of the least developed regions with low levels of financial inclusion (World Bank, 2017). On the other hand, economies with high levels of financial inclusion tend to record better economic growth and poverty reduction (Beck, Demirgüç-Kunt and Levine, 2007). In order to improve the situation of the developing economies, the World Bank, in partnership with others, drew a vision of "Universal Financial Access by 2020". In line with this initiative, different nations have adopted strategies and policies that help to expand access and use of financial services (Demirgüç-Kunt, Klapper, Singer, Ansar and Hess, 2018). In addition, some developing nations such as Tanzania, Madagascar, Namibia, and Nigeria established a Financial Inclusion Commission that monitor and follow-up its progress (World Bank, 2017).

Facts shown above indicate that broad and easy access to financial services could be beneficial to improve the life of the poor as it encourage saving and investment, and thereby economic growth (Beck *et al.,* 2007). However, countries within SSA are found at different stages of financial inclusion and economic growth. In addition, there is no consensus on the key factors that affect financial inclusion and financial stability across regions and nations. Despite consensus on the importance of finance to economic growth, there are still questions on the level of impacts of financial inclusion on financial stability and growth across countries with diverse levels of development. In addition, empirical analysis on the causality between financial inclusion, stability

and economic growth in low income countries are still not conclusive and requires further effort to identify whether these variables are complementary or mutually exclusive. It is, therefore, necessary to assess the factors that induce financial inclusion and stability and identify the impact of financial inclusion on financial stability and economic growth in the context of developing countries in the Sub-Saharan African region.

1.2 Overview of the Sub-Saharan Africa - Financial Inclusion and Stability, and Growth

The sub-Saharan Africa constitutes forty-eight member states, most of which have low level of development. It is home to more than 1.2 billion populations and the world's largest free trade areas. It is one of the least developed regions of the world with the lowest total gross domestic product (GDP). Its average GDP per capita is below two thousand dollars, far less than the world average (World Bank Development Indicator, 2021). The economy of the sub-Saharan Africa is dominated by the informal sector, which include small scale farming, craft making, small-scale mining, and other services like housekeeping, ride services, or vehicle maintenance, and others. Most of these economic activities cannot be easily regulated by the government. In addition, such informal economic activities are not accounted in the GDP or taken into account in the official employment rate of a country.

Since 2000, the Sub-Sahara Africa has crafted and implemented an entirely new development path, which gives emphasis to the potential of its economic resources and people. Consequently, the region has registered a sustainable and continuous rapid economic growth since the early 2000s, which is a period known by many as "Africa rising". Despite a slight reduction since 2014, the region has registered consistent economic growth for the last 20 years. Annual GDP and GDP per capita growth trends of the region for the past twenty years (2000 – 2019) are shown in the figure below.

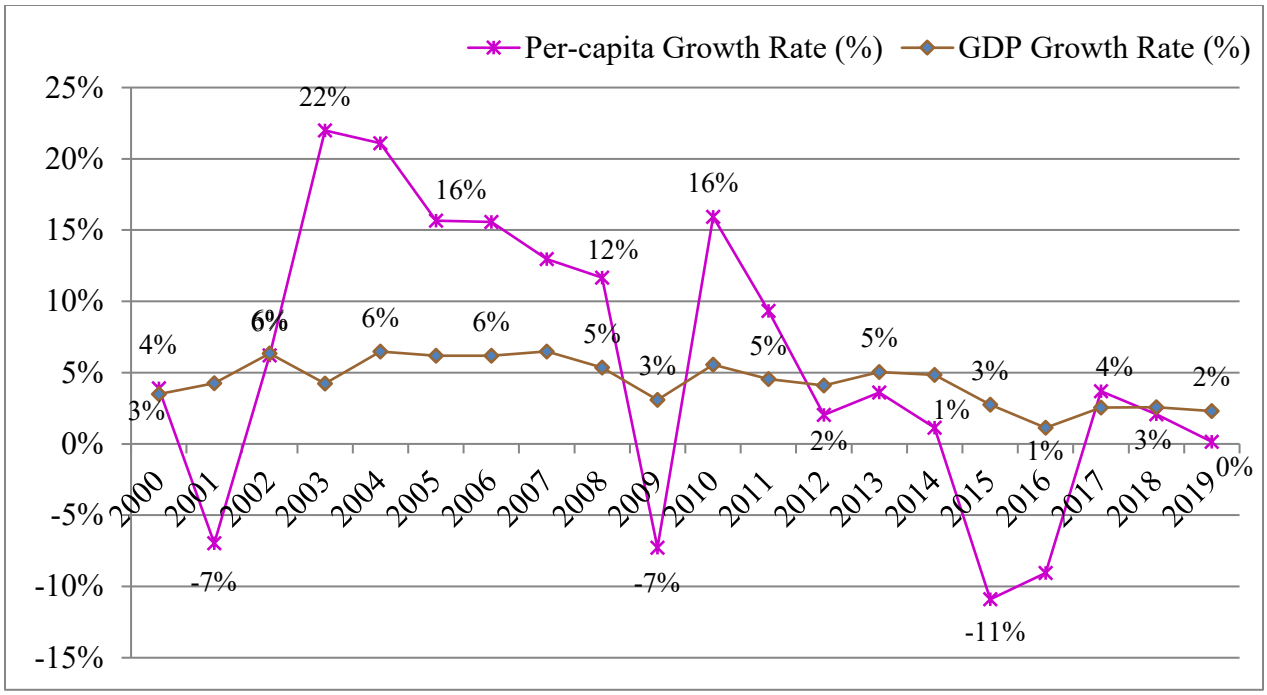

Figure 1: GDP and GDP per capita - Annual Growth Rate

Source: World Bank Database (2000 – 2019)

Figure 1 above depicts that the lowest economic growth of the region was registered in 2009 (3%) and 2019 (2%), which is still positive. In 2018, eight of the twenty fast growing economies were found in the SSA. Despite high economic growth in countries such as Ethiopia and Ghana, there is high concentration of wealth in some sub-Saharan African countries. South Africa and Nigeria, the region's wealthiest countries, generated large proportion of the region's GDP. On the other hand, the region exhibited a negative and low GDP per capita growth at the beginning of the millennium and during the periods of the financial crises, indicating the positive growth of the region did not translated to employment, higher income and poverty reduction, and hence inequality remains the problem of the region. One of the main reasons for the weak performance of the economy in employment creation and income inequality is the insufficient level of the private and public investment (IMF, 2015).

On the other hand, the outbreak of COVID-19 in 2019 has disrupted the supply chain and limited the scope of trade and tourism, which led to economic slowdown and raised socio-economic venerability across the region (World Bank, 2020). Economic activities of the region declined significantly due to the containment measures taken and resulted in macroeconomic instability,

which is increasing poverty and household welfare losses across the low income groups of the population (IMF, 2020). At any rate, the proportion of people with low level of income per day has been reducing during the past 20 years, as depicted in Figure 2 below.

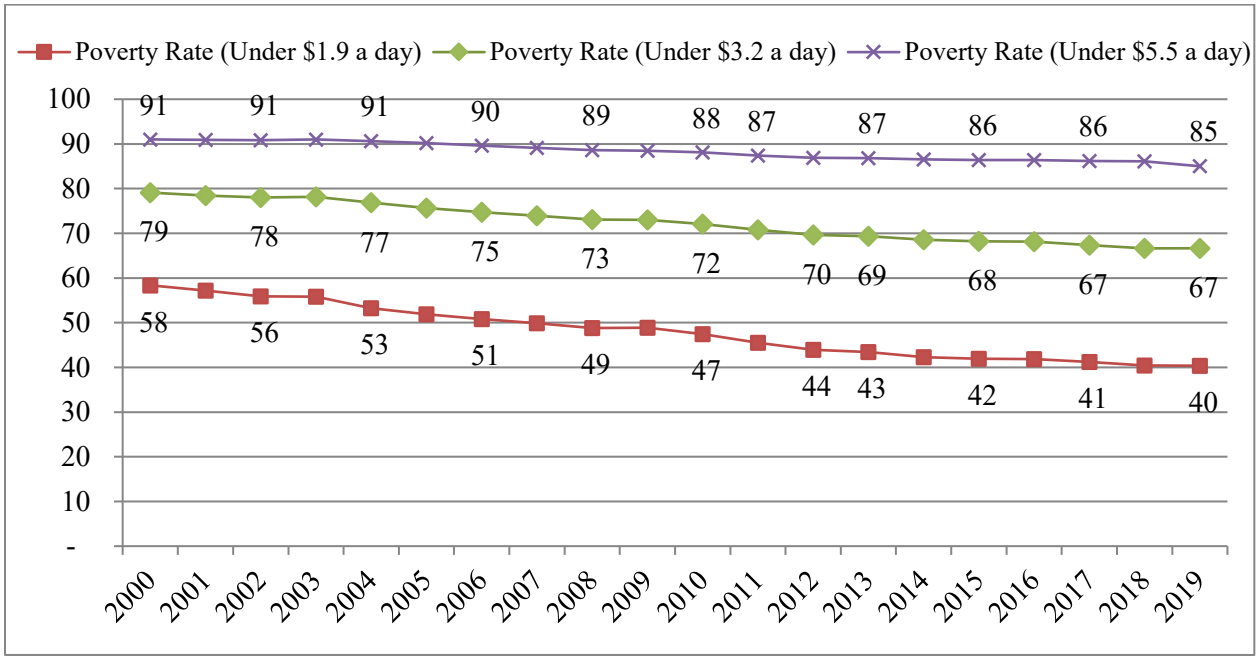

Figure 2: Poverty gaps at US $1.9 and US $5.50 per Day (%)

Source: World Development Indicators (2000 – 2019)

Figure 2 above show that the proportions of people living under extreme poverty, i.e. people that earn below US $1.9 per day were 58% at the beginning of the millennium. However, this figure exhibited a reduction to 40% at the end of 2019, indicating improvement. Similar trends were observed at the higher level of poverty line. However, poverty reduction has been much slower at the higher lines than the lower one. In addition, the regional poverty rate decreased by 1.6 percentage points between 2015 and 2019, but still the Sub-Saharan Africa constitutes two-third of the global extreme poor population, and hence there exist a long way to go to reduce the level of poverty and ensure prosperity in the region (World Bank, 2020). In order to address this problem, scholars advocate the importance of financial inclusion and financial stability. Some scholars advocate that financial inclusion plays a key role to ensure sustainable economic development and financial system stability, and hence used as one of the main factors by policy

makers in most developing economies (Sharma 2016; Ahamed and Mallick, 2019; Ozili, 2020; Al-Own and Bani-Khalid, 2021).

In line with the above argument, various efforts were made to enhance the level of financial inclusion in the SSA countries. As per the Global Findex Report (2017), a large number of adults (515 million) opened bank accounts and started to use financial services between the period 2014 and 2017, which raised the number of total global adults with account to 69 percent. However, the proportions of adults that have account in the high-income economies were significantly higher (94%) than the developing world (63%). According to the same Global Findex report, most of the recent progress has been driven by the innovation of digital payments and government policies (Demirgüç-Kunt *et. al*, 2018). However, the level of financial inclusion in sub-Saharan Africa was the lowest of all the developing regions (Global Findex, 2017).

In the SSA, the financial system is weak and ranks the lowest in terms of most financial development indicators. In 2017, on average, only 43% of the adult populations of the region had bank accounts. In terms of gender, 43% of males and 48% of females do have accesses to financial services. In contrast, around 71% of the population of the emerging East Asia and Pacific countries has access to financial services. Furthermore, only 58% of males and 52% of females of this region has access to basic financial services, indicating the existence of a wider disparity with the level registered in SSA (Global Findex, 2017).

Several reasons can be cited for the low level of financial inclusion in SSA region. One of the reasons for the low service adoption in the developing economies such as the SSA is the poor financial services infrastructure. Unlike the developed world, banks are still the major sources of finance to a variety of investment modalities ranging from concessions and public-private partnerships (PPPs), syndicated loans, and infrastructure projects in the region, indicating the limited development of other sources of private funding as well as financial sector development.

According to Makina (2017), most Sub-Saharan African (SSA) countries differ from each other in a number of indicators such as economic size, population, literacy, health coverage, legal structures, and policy framework. In the same manner, the financial systems of these countries are highly heterogeneous in terms of accessibility, availability and usage. Common features of the

region can be shown as low levels of financial inclusion, poor knowledge of financial services, limited access and high cost of credit, discrimination in ownership and use of accounts, and weak and inefficient foreign exchange markets. However, the region still has a promising trend, especially in the adoption of the mobile money innovation, which has the potential to enhance easy financial penetration and availability, and foster inclusive financial systems (Makina, 2017). Figure 3 below depicts the financial development index of Africa in comparison to the Asia and Pasfic region.

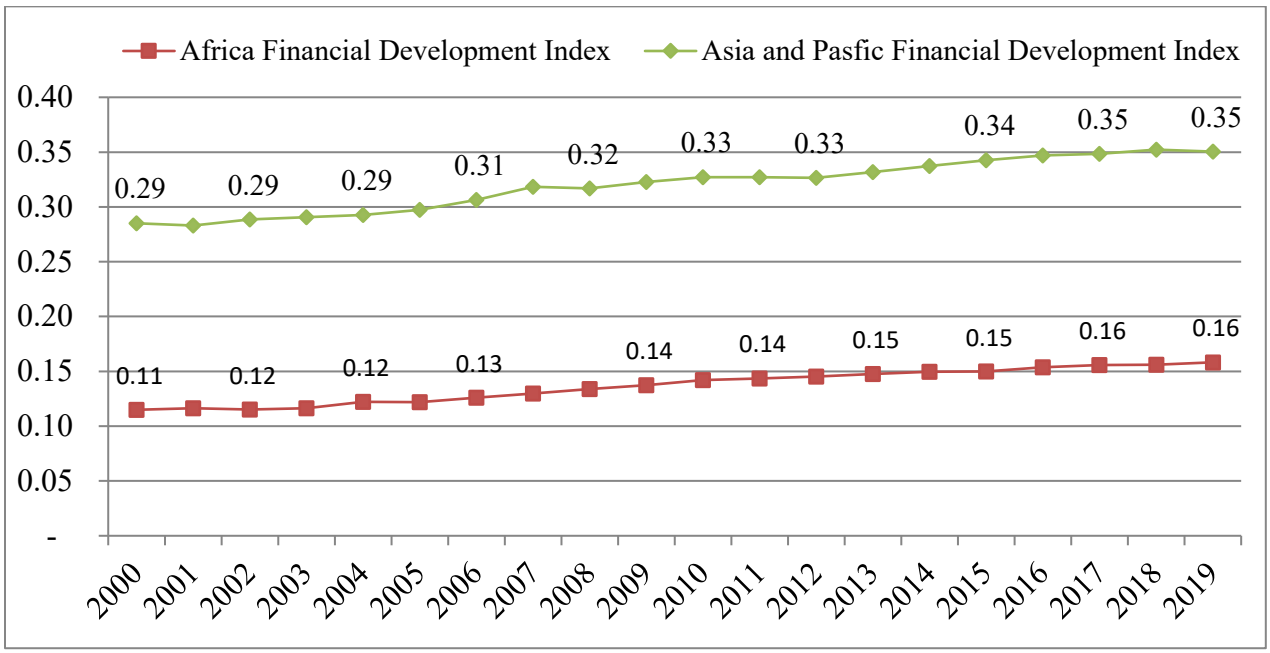

Figure 3: Financial Development indexes of Africa and Asia and Pacific

Source: IMF database (2000 - 2019)

Financial inclusion is one of the key constituents of financial development (Emara and Said 2021; Zulkhibri 2016). As a result, majority of the public authorities use financial inclusion in promoting inclusive economic growth and tackling poverty through ensuring financial access to all segments of the society (Jungo, Mara, and Anabela, 2022). From the above figure, it is possible to observe the significant variation that exists in the level of financial development between Africa and Asia. During the past 20 years, Africa registered only 0.04 point growth while Asia registered 0.07 point growth during the same period, indicating relatively slow growth in financial inclusion.

In spite of variation in the level of financial development, the financial sector of most sub-Saharan African countries has registered encouraging progress over the last two decades. Private credit to GDP of the region has doubled from the 1995 level. The region, particularly the East African countries, has led the world in the adoption of mobile telephone based financial services. Expansion of M-Pesa, M-Shwari, and M-Kopa has contributed for the rise in personal transaction and growth of the financial sector of Kenya. It played its own role to reduce transaction costs even in the area where there is no conventional financial infrastructure (IMF, 2016). However, except the middle-income countries of the region, the development level of financial markets and financial institutions is the least. On the other hand, the expansion of Pan-African banks is now contributing for a greater economic integration, and bridging the gap left by foreign global banks. However, inadequate supervisory oversight and weak internal governance frameworks has posed challenges on the effectiveness of these institutions (IMF, 2016).

In most SSA countries, the financial sector is still found under its infant stage of development. In 2017, the number of mobile money adopters reached 21% of the total populations, while the total number of ATM debit card adopters has been 18% of the total population, and this proportion is lower (16%) in the rural areas (Global Findex, 2017). However, the region has registered significant milestones in terms of financial service penetration, availability and usage dimensions, which is mainly driven by innovation of mobile money services. Middle-income countries such as Mauritius, South Africa, Namibia and Morocco have registered rapid growth in the use of formal non-bank financial services. Financial technology has bridged the geographical barriers across sparsely settled rural population and contributed to a cost reduction. Financial technology has softened the constraints linked to access for financial services in the traditional business model such as regulations, paperwork for accounts opening, mandatory deposits, bank charges, and long distance travel to towns with financial infrastructure. Despite infrastructural limitations, mobile money service has improved the financial services of the region and raised its level of penetration (Global Findex, 2017).

Inclusive financial system has strong importance for the SSA as it brings a large proportion of productive sectors under the formal and regulated financial system. In order to achieve this goal, rapid expansion of financial technologies is helpful to raise the level of penetration and access to

financial services in Africa, which is one of the critical milestones to enhance the level of financial inclusion in SSA (Balele, 2019). However, the financial system of the SSA still lack integration with the rest part of the world and its geographical connectivity is inadequate, which constrains easy access of the conventional model in areas where there is a poor physical infrastructure and low population densities (Global Findex, 2017). This study is, therefore, conducted to assess the critical factors that affect financial inclusion and financial stability, and examine the causality between financial inclusion, financial stability and economic growth so as to determine the direction of the relationships and identify strategies and policy directions that will help to enhance the level of financial inclusion in the region.

1.3 Statement of the Problem

Financial inclusion, in its common use, refers to the access, availability and usage of financial services. The level of financial inclusion varies across countries and regions. The World Bank report indicated that close to 1.7 billion people have no bank account and outside the financial system, and about half of the unbanked people are women and low income households (Global Findex, 2017). In the stated report, it is also shown that there is low level of financial inclusion in the Sub-Saharan Africa, where the average proportion of adults with bank accounts has been below 43%, and the condition varies across countries. Literatures cited several factors for the low level of financial inclusion in Sub-Sahara Africa countries. Allen, Demirguc-Kunt, Klapper, and Peria (2016) identified that the level of financial inclusion is significantly influenced by the level of income, education, age, marital status and employment. Willingness for technology adoption, technical know-how and fear of loss of money are the other obstacles for financial inclusion in SSA countries (Gebrehiwot and Makina, 2015). Service outreach, especially in rural areas, the levels of financial literacy, lending rates, and saving and loan repayment culture are also major challenges of financial inclusion in SSA countries (Balele, 2019). All the above researches show that there are various factors that limit financial inclusion in Sub-Saharan Africa, indicating that the topic is still inconclusive and requires further research across nations and regions. In addition, such variation indicates that the area is complex to address easily as there are several factors and many issues to be examined at a time.

Financial inclusion affects the composition of financial transactions, the type of customers and the

structure of financial institutions in a market. Such market dynamisms may raise competition, instability and risk of financial crises (Mostak and Sushanta, 2015). In some cases, there is policy trade-offs between financial stability and financial inclusion. Despite this fact, a large number of developing countries are making effort to promote financial inclusion, i.e., working to enhance access to finance for low-income groups, as part of their financial and economic development strategies. This could raise the question of whether financial inclusion and financial stability are alternates or complements. On the one hand, increased use of macro-prudential policies measures lowers credit expansion in pursuit of achieving financial stability, and increase in financial inclusion may endanger financial stability, as not all borrowers are creditworthy, which may lead to credit and liquidity risks (Gould and Melecky, 2017; Tissot and Gadanecz, 2017). However, the stability of the financial system is important to ensure sustainable economic growth in the Sub-Sahara African countries. As a result, several researchers claim that financial stability can be considered as a public welfare (Blot, Creel, Hubert, Labondance, and Saraceno, 2015). In addition, studies made on the relationship between financial inclusion and stability is largely inconclusive (Leon, 2015). Thus, conducting an assessment on the drivers of financial stability is essential to identify the factors that affect financial stability. In addition, examining the causation between financial inclusion and financial stability is helpful to determine the effect of financial inclusion on financial stability of the Sub-Saharan African countries.

A large number of scholars identified financial inclusion as one of the major building blocks of inclusive growth, and it has been taken as an important driver for the socio-economic performance of a country (Demirgüç-Kunt, Klapper, and Singer, 2017; Bruhn and Love, 2014; Sahay, Cihak, Diaye, Barajas, Mitra and Kyobe, 2015). However, literatures show variation on the causality between financial inclusion and economic growth. Several empirical studies confirm a significant positive association between financial inclusion and economic growth (Makina and Wale, 2019; Norris, Yan, Townsend, Unsal, 2015; Bruce, Gine, Goldberg, and Yang, 2013; Harihanan and Marktanner, 2012). Demirgüç-Kunt, *et al.* (2017) identified a positive and significant relationship between financial inclusion and economic growth, and argue that low level of financial inclusion is one cause of inequality and poverty. On the other hand, there are studies that show the reverse is true, economic growth and socio-economic status of the people is critical to enhance financial inclusion (Robinson 1952; Somoye, 2011; Sharma, 2016).

The Global Findex (2017) report shows that there is a low level of financial inclusion in developing countries than developed countries, and low level of access and use of finance is one of the factors that contributed for the problems of unemployment, income inequality, poverty and other socio-economic challenges. Low access and use of finance in SSA economies has prevented the poor and other disadvantage groups to promote entrepreneurship and invest in education. In addition, lack of access to financial services makes it difficult to save in formal financial institutions and get credit facilities so as to start business (World Bank, 2017). Financial inclusion is considered as important to achieve most of the UN Sustainable Development Goals (SDGs) and the Africa Union (AU) Agenda of 2063 in SSA countries. Financial inclusion indicated in at least seven of the seventeen SDGs, and considered as an enabler that help to ensure the success of the core SDGs, including eradicating poverty, zero hunger, good health and well-being, gender parity, and economic growth and more jobs (World Bank, 2017). Thus, most governments and policy makers identified financial inclusion as a policy priority in most developing economies and become an academic and policy issue and one of the factors to be considered in the development of strategies and policies.

Financial inclusion is critical to enhance economic and social empowerment, and access to finance will promote inclusive growth and help to ensure sustainable development (UNSGS Annual Report, 2016). In this regard, the World Bank identified financial inclusion as a key enabler to reduce poverty and promote shared prosperity, and set an ambitious global goal of achieving Universal Financial Access (UFA) by 2020 (World Bank, 2018). However, inclusive financial systems will be difficult to realise without stability in the financial system and vice versa. It is challenging to attain financial stability, while large segments of the population are financially excluded, like in the case of Sub-Sahara Africa (Khan, 2011). Financial stability strengthens the link between financial inclusion and its regulation (Anarfo et al., 2020). Stable financial institutions easily expand financial products and services, which significantly contributes for financial inclusion (Musau et al., 2018). In addition, there are several factors that affect financial inclusion and it is complex to easily identify the level of financial inclusion as there are too many issues to be examined at a time.

On the other hand, to the knowledge of the researcher, the simultaneous relationship between

financial inclusion, financial stability and economic growth are not well addressed in the past, and hence it is an ideal context to consider this research topic in light of the objectives of supporting the various sustainable development strategies and contributing to the efforts of creating evidences on the relationships between the three variables through extending the effect of financial inclusion on financial stability and economic growth in the Sub-Sahara Africa countries. In doing so, the research not only contribute for the body of knowledge, but also addresses the research gaps so as to design proper policies and strategies that will help support the efforts of improving financial inclusion, financial stability and economic growth in the Sub-Saharan African economies.

1.4 Research Objectives

1.4.1 General Objective

The overall aim of this research is to assess and identify the factors that affect financial inclusion as well as financial stability and examine the link between financial inclusion, financial stability and economic growth in selected Sub-Saharan African countries. It examines how and to what extent, financial inclusion influences financial stability and economic growth over the past twenty years by assessing the co-integration and casual relationships that exist between the three variables. The study has also the aim to contribute to the debate that exists on the effect of financial inclusion on financial stability and economic growth in the continent, and hence helps to draw strategies and policy directions, as well as open avenues for further research.

1.4.2 Specific Objectives

Consistent with the overall objective of this study, specific objectives of the research are:

- To examine the key drivers of financial inclusion in selected Sub-Saharan African countries;
- To assess the key determinants of financial stability in selected Sub-Saharan African countries;
- To examine the relationships between financial inclusion, financial stability and economic growth in selected Sub-Saharan African countries; and
- To analyse the causal relationships between financial inclusions, financial stability and economic growth in selected Sub-Saharan African countries.

1.5 Research Questions

In line with the research objectives, the study will answer and give insight to the following key research questions. These are:

- What are the deterministic factors that affect financial inclusion in selected Sub-Saharan African countries?
- What are the main drivers of financial stability in selected Sub-Saharan African countries?
- In what way and to what extent are financial inclusion, financial stability and economic growth cointegrated in the long run in selected Sub-Saharan African countries?
- What causal relationships exist between financial inclusion, financial stability and economic growth in the selected Sub-Saharan African countries?

1.6 Scope of the Study

Unlike other developing regions, most Sub-Saharan African countries have low levels of financial inclusion and low levels of economic development. Hence, a large number of adult populations in the SSA region do not have access to financial services, indicating a high level of financial exclusion (Global Findex, 2017). On the other hand, despite financial liberalisation, the financial sector is still the preserve of a few elites in the SSA (Beck, 2015). In addition, a low financial inclusion is identified as one of the reasons for the high poverty and inequality (Park and Mercado, 2015). In order to address this problem, this research gave focus to the assessment of the factors that induce financial inclusion and financial stability in selected Sub-Saharan Africa countries. In addition, examination is to be made on the short and long run relationships between financial inclusion (FI), financial stability (FS) and economic growth (EG). This study sought to determine the direction and magnitude of causality between financial inclusion, financial stability and economic growth in selected Sub-Saharan Africa countries.

In terms of geographical coverage, although Sub-Saharan Africa constitutes forty-eight countries, this study covered around fifty percent of these countries that have fully available secondary data for the period under review. Thus, the study is limited to a sample of 26 countries with full datasets. However, in order to capture disparities across the region, the study considered a mix of upper, middle and lower-class economies of the region from all directions. In terms of time demarcation, the study covered twenty years, between the year 2000 and 2019, due to the limited availability

data for countries under study. Thus, undertaking this study under the scope of this region and topic is believed to be ideal to identify the factors that affect financial inclusion and stability and provide evidence on the effect of financial inclusion (FI) and financial stability (FS) on economic growth (EG) of developing countries so as to draw a proper policy directions, strategies and regulations.

1.7 Significance of the Study

Inclusive finance creates an environment that integrates financial products and services with the interest and needs of all members of the society. On the other hand, given the heterogeneous feature and low level of financial inclusion of the SSA countries, such type of research will help to assess and identify the factors that affect financial inclusion and stability so as to fill information gaps in the area. The study also examines the short run and long run association between financial inclusion, financial stability and economic growth in the region. Moreover, the study simultaneously examine the causality that arises between financial inclusion (FI), financial stability (ZScore) and economic growth (LnGPPc) and identify whether there exist complementarity or trade-off between these variables and whether financial inclusion (FI) is important to promote stability and economic growth in Africa, or vice versa so as to come up with relevant policies and strategies that will address the gaps.

Scholars and policy makers often have diverse perspectives on the policies that foster financial inclusion and stability, mainly due to a variation in data and research methodology (Johnson and Williams, 2016). Hence, undertaking a research within a diversified region that have low level of financial inclusion, low economic development and high poverty makes the Sub-Sahara Africa unique and relevant to assess the key drivers of financial inclusion and stability and identify the association between financial inclusion, financial stability and economic growth so as provide a logical and relevant advice. In addition, financial inclusion is identified as the critical enabler to ensure development, and hence it may be difficult to realise most of the United Nations SDGs and the AUs 2063 Agenda without finance and financial inclusion in developing countries. Thus, this type of comprehensive empirical studies is an important reference document for other researchers who have an intention to undertake similar studies in these areas.

Subject to the above facts, this study will enhance the awareness of strategists and policy makers that are working in central banks and other regulatory bodies on the critical factors that limit financial inclusion and stability in SSA. The findings of the research may help the regulatory organs of the financial sector to formulate relevant policies, rules and regulations that would help to enhance financial inclusion and maintain financial system stability. In line with the initiatives of the Universal Access to Finance (UAF) by 2020, a large number of African countries have crafted and implemented various strategies to improve the role of the financial system and expand access to financial services. However, there is a possibility that unintended consequences may arise on the financial stabilities as a result of an inappropriate implementation of financial policies and strategies (Ayyagari *et al.,* 2017). Hence, participants of the financial system of the region may learn of the factors that affect financial inclusion and stability and the casual relationship between FI, FS and EG and what policies and regulations to follow to ensure financial inclusion and stability. It may also help to raise the awareness of the management of financial system to ensure that the operations of financial institution conform to the regulations so as to enhance financial inclusion and maintain stability. Various factors, macro as well as micro-economic, affect financial inclusion and financial stability and thus, this study help to address issues linked to financial inclusion and stability.

On the other hand, the general public may get information on the factors that affect financial inclusion and financial stability and understand the effect and contribution these factors may have on the economic growth in SSA. The acquired knowledge from this study may help in adopting the right decisions on how to act in managing financial resources and understand its impact on the financial sector and the economy as a whole. The public that is keen on financial inclusion and stability can assess the factors and economic conditions since this study established the relationship between the different variables that affect financial inclusion and stability and their impact on economic growth. The research will also contribute into the debate on the status of financial inclusion of the continent and provide information to the stakeholders and development actors about the existing opportunities and challenges that need their attention and action.

The study also contributes to the existing body of knowledge through unpacking the factors that affect financial inclusion as well as stability and points out area for further research. It also gives

clue on what policy frameworks and regulations are important to ensure financial inclusion and financial stability and identify the impact of these factors on economic growth in SSA. This study may increase the knowledge of researchers and academicians on the impact of financial inclusion and financial stability on the economic growth of SSA and give empirical evidence on the relationship between these variables. Future researchers can use the findings of this study to justify the relationship between the factors that affects financial inclusion and stability and their economic implications in the SSA countries.

1.8 Contribution to Knowledge

Social and economic development cannot be assured without finance. Access to financial services is, thus, critical to mobilise financial resources, promote investments and ensure smooth business transactions. Financial inclusion is one of the major factors that help to enhance economic growth through value creation of start-up and small businesses with positive spillover effects on socio-economic development, including health, education and poverty (Park and Mercado, 2015; Kim, 2016; and Nanda and Kaur, 2016). Financial inclusion raises household income and thereby reduces poverty and inequality with the potential to improve the economic well-being of households and promote the activities of small enterprise (Naceur, Barajas, and Massara, 2015). Expansion of financial services increases the income of the poor and allows informal businesses to expand within the economy (Bruhn and Love, 2014). However, the drivers of financial inclusion vary across regions and countries, and researches made to identify the factors that influence financial inclusion are still not conclusive as the area is complex to address the issue, and thus additional researches may add new insight to the area.

Financial inclusion is identified as a key enabler for at least seven of the seventeen Sustainable Development Goals (SDGs). As a result, a large number of countries have prepared and implemented a national financial sector strategy geared towards financial inclusion (World Bank, 2017). Therefore, knowledge on financial inclusion is critical for policy makers, regulatory agencies and executives to formulate the right policies and strategies that would help financial system to promote financial service availability, accessibility and usage so as to address the issues of economic growth. The UN Secretary General Special Advocate's (UNSGSA's) Annual Report (2016) indicated that access to financial resources remains a challenge to a significant number of

individuals and enterprises in the least income countries (LICs). With the situation at hand, it is very unlikely to realize some of the key targets of the United Nations' SDGs and the AUs 2063 Agenda in some of these countries unless a proper policy measures and strategies are designed to address the issues of finance and financial inclusion, especially in SSA countries. It is, thus, critical to assess the factors that affect financial inclusion in Sub-Saharan Africa and identify their nexus with economic growth.

Researches show that there are various factors that determine financial stability. Some of these factors are economic and others are regulatory and policy factors (Cukierman, 2013). A large number of scholars argue that financial inclusion is important to ensure financial stability. However, there is a mixed view on the link between financial inclusion and financial stability. Al-Smadi (2018) examined the association between financial inclusion and financial stability in Jordan and identified that financial inclusion has strong positive effect on financial stability. Stable financial systems, in turn, help to enhance efficient resources allocation and eliminate possible market imperfection. Ahamed and Mallick (2017) investigated the nexus between financial inclusion and stability using macro-level data, and learned that financial inclusion has positive contribution to bank stability, especially in countries with high quality institution and regulations. On the other hand, there are studies which revealed that financial inclusion reduces the requirements of lending and increases reputational risk, which weakens the overall effectiveness of financial regulation and increase systemic risks (Khan, 2011). It is, therefore, important to identify the key determinants of financial stability and examine the nexus between financial inclusion and financial stability in SSA countries so as to come up with policy measures that help to promote the contributions of the financial system.

Unlike other research areas, the assessment of a financial inclusion requires multidimensional views. However, the existing datasets have their own limitation to undertake comprehensive analysis and provide the full picture of a financial inclusion (Sharma, 2016). Individual indicators of a financial inclusion give only a partial information and may lead to a misleading conclusion (Sharma, 2016; Pinna, 2018; Ahamed and Mallick, 2019). In order to address the research gaps arising from using individual indicators, same authors developed and applied a composite FI index. In addition, there are a relatively limited number of empirical studies that simultaneously assess

the causality between financial inclusion, financial stability and economic growth (Sotiropoulou, Giakoumatos and Petropoulos, 2019). Simatele (2021) argued that scholarly work that exists on financial inclusion lacks a comprehensive discussion on how the poor interact with the financial service provider and the channels through which such services can affect their livelihoods, and advocated the need for a comprehensive assessment.

Moreover, the results of the existing empirical studies lack consensus on the pivotal factors that induce financial inclusion and financial stability and how financial inclusion influences financial stability and economic growth. Park and Mercado (2015); Evans and Adeoye (2016); Asuming, Osei-Agyei and Mohammed (2019) and Ali and Khan (2020) argued that financial inclusion and economic growth have a strong positive relationship. On the other hand, there are scholars with a view that there is a negative and significant short-run causality between financial inclusion and economic growth (Khan, 2011; Naceur and Ghazounai, 2007; and Daryl and Amolo, 2018). Demetriades and Hussein (1996), however, argued that the theory that economic growth promotes financial inclusion is not always true as there is a causality that runs from finance to economic growth, supporting the argument of a growth-finance nexus. Sharma (2016) revealed that financial inclusion has both unidirectional and bidirectional causation with economic growth depending on the type and nature of indicators used for financial inclusion. According to Sharma (2016), geographic outreach and economic growth has bidirectional causality, while the number of deposits to loan accounts and economic growth has a unidirectional causality, indicating that the direction of causality runs in either direction.

Unlike the previous studies, most of which concentrated on the nexus of either finance-stability, or finance-growth (Balele, 2019; Mehrotra and Yetman, 2015; Norris *et al*., 2015; Wale and Makina, 2017), this study simultaneously examined the causality between financial inclusion, financial stability and economic growth in order to bridge the knowledge gaps in this area. It also seeks to determine whether financial inclusion has contributed to the economic variation between the SSA countries. It further explores how financial inclusion affects financial stability of these countries. In addition, the study assesses the implications of financial inclusion and financial stability on the key development indicator (economic growth) and proposes possible policy recommendations for consideration by various regulatory bodies, in line with the objectives of the UN and AU agendas for

financial inclusivity.

Studies made on the effect of financial inclusion on financial stability or economic growth revealed mixed findings. Morgan and Pontines (2014); Ahamed and Mallick (2019) and Ozili (2020) argue that there is a positive and significant relationship between financial stability and economic growth. On the other hand, there are some authors that argue there is a negative relationship between financial stability and economic growth (Sahay et al., 2015 and Cihak et al., 2016). A proper examination of the relationship between these three variables together help to identify whether they are complementary to each other or not and contribute to the knowledge pool of literatures. It also helps to points out the focus areas of monetary policy frameworks in the region so as to improve the efficiency and effectiveness of resource mobilisation and allocation. Such a study also helps to identifies specific policies and strategies to be adopted in SSA countries so as to enhance the level of financial inclusion and stability, and promote overall economic growth in the region.

In terms of methodology, the research applied quantitative techniques. Majority of the studies that are conducted to assess and identify the key drivers of financial inclusion and stability, and examine the causal relationship between the stated variables used probit and logit (Nandru, Byram and Rentala, 2016; Abel, Mutandwa and Roux, 2018; Chu, 2019; Poonam and Chaudhry, 2019); ordinary least square methods (Bayero, 2015; Asuming, Osei-Agyei and Mohammed, 2019; Ma, 2020); panel fixed and random effects (Anarfo, Abor and Osei, 2019; Ijaz et al*.,* 2020); and panel GMM (Gebregziabher and Makina, 2019; Evans and Adeoye, 2016; Makina and Wale, 2019). In line with the nature of the dataset, which is short time span, and the features of the models, this study applied dynamic Generalized Method of Moments (GMM), ARDL and Granger Causality tests, respectively, to achieve the objectives of the study, which include assessing the various drivers of financial inclusion and financial stability, and identify the casual relationships between the three important variables, financial inclusion, financial stability and economic growth, in SSA countries in the period between 2000 and 2019.

Studies conducted to assess the determinants of financial inclusion and its effect on financial stability and economic growth has benefited developed economies to design proper policies and strategies that help to ensure the efficient and effective utilisation of financial resources and promote economic growth. Thus, the contribution of this study is largely to resolve many policy

and strategic issues of finance, stability and economic growth of the developing countries. Sub-Saharan Africa is, thus, an ideal context to assess the main drivers of financial inclusion and stability, and identify the causality between financial inclusion, financial stability and economic growth. In addition, this research will help practitioners and academicians as a reference material for further research on the area with similar context and varying time. It also helps to raise the awareness of policy makers, regulatory bodies, strategists, and practitioners, including executives working in the financial sector, to reconsider their policy frameworks and strategies.

1.9 Chapter Summary and Conclusion

In this chapter, efforts were made to introduce the study by highlighting its background. Consistent to the topic under discussion, an overview was given on the socioeconomic and financial development status of the SSA economies. In line with the background information, the SSA region is identified as one of the least developed regions in the world with low financial inclusion index. However, the region has large potential for growth and development. In addition, the chapter described the problem statement in a way that helps to understand why the research is initiated with a proper justification. Consequently, the chapter listed out the research objectives and the research questions and briefly articulated and properly stated in a way that links the specific objectives with the research questions. In addition, detail explanations were given on the scope of the study, its significance, and contributions to knowledge. The ensuing chapter considers the relevant literature which underpins the theoretical and empirical frameworks for this study.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

Literatures on financial inclusion and financial stability gave emphasis on either developing comprehensive indicators, or exploring their key determinants and their relationships with the other dimensions of financial and economic indicators. In this section, the conceptual, theoretical and empirical foundations of the financial inclusion, financial stability and their relationship with the other variables are articulated in a precise manner. In the first section, the concepts of financial inclusion, financial stability and economic growth are discussed and a conceptual framework of the study is drawn to indicate the relationship between the factors under consideration. In the second section, the theoretical underpinnings of each of the above concepts and their relationship are deliberated in detail. Empirical findings of the critical factors that limit financial inclusion and financial stability and their relationships with economic growth are incorporated in the final section of the chapter.

2.1 Theoretical Backgrounds

In this section, the different theories of financial inclusion, financial stability and economic growth are discussed to give insight and background for the research. In general, theories give an insight on how to design a research question, guide data selection, interpret results, and propose explanations for the causes or effect of the phenomena (Pigott, 2017). They give different perspectives through which to look at the complex social issues, shape attention on different aspects and help provide a framework within which to conduct the analysis.

2.1.1 Theories of Financial Inclusion

Various theories explain the rationale behind a financial inclusion. These theories are linked to the different financial inclusion objectives and on the how to achieve these objectives. Financial inclusion theories explain the practices and deviations that exist in financial inclusion and identify the objectives, processes or outcomes so as to develop a coherent and comprehensive system. Financial inclusion theories explain the debates in the policy literature and provide principles on the practice of financial inclusion and detect abnormalities (Ozili, 2020). In general, financial inclusion theories are mainly categorized into economic (neoclassical economic theory and new-

Keynesian theories) and interdisciplinary theories (institutional theories, behavioural economics, and political-economy theories) (Buckland, 2012), the most relevant ones are discussed below.

The neoclassical economic theory considers economic agents as critical and considers the role of the state as secondary. In this theory, economic agents such as firms and households are considered as rational, and have full information. As a result, financial inclusion/exclusion is the result of consumer choice or state policy intervention. The consumers' choice to use the informal financial services instead of the formal system is mainly linked to economic costs, which is one of the factors that limit financial access to the poor and the low income group. The new-Keynesian theory, on the other hand, gives emphasis on the factors that lead to market distortions as a result of information asymmetries. A financial market imperfection is, thus, at the core of this thought. In line with this theory, inequalities persist because of market imperfections. It is because of market frictions that poor people cannot invest in their education and health despite their high marginal productivity of investment (Galor and Zeira, 1993). In this theory, financial exclusion is related to the concept of credit constraints. Imperfect information is one reason for credit exclusion, whereby creditors tend to reduce interest rates and restrict credit so as to avoid credit risk, which may lead to income inequality (Stieglitz and Weiss, 1981). On the basis of the above theories, it is possible to conclude that there are several factors that drive financial inclusion. Other specific theories linked to financial inclusion are discussed below.

A. Institutional Theory

Institutional quality shapes the economic behaviour of market participants. Institutional quality determines the behavior and level of interaction of economic agents. Schumpeter (1911) explained the critical role of financial institutions and finance to carry-out innovations, which leads to creative destruction and development. In line with this view, credit, money and finance are essential for intermediation (Knell, 2012). Business and economic productivity can be raised creative destruction through enhancing the speed of capital reallocation. Credit is, thus, a precondition for those entrepreneurs who are willing to realise their innovation and financial institutions plays significant roles in facilitating credit to those with resource needs. Opinions raised above indicated that financial institutions are important instruments for financial service expansion and thereby financial inclusion.

Money creation in the form of credit by banks is the major sources of finance for entrepreneurs (Legrand and Hagemann, 2007). Hence, credit processing mechanism is a bridge between the real and financial sector, and hence money plays a significant role to start new production process so as to ensure integration between the monetary and 'real' aspects of the economic system (Schumpeter, 1911). Weak institutional structure framework results in weak market operation, high uncertainty and misallocation of resources (Demetriades and Law, 2006). Strong institutional framework improves the level of governance, minimize bureaucracy and reduce corruption (Bräutigam and Knack, 2004). Poor institutional environment, thus, leads to information asymmetry and influences the contract management, and hence reduces both accessability and usage of financial services.

B. Information Asymmetry Theory

Information asymmetry theory postulated that there is information problem in the financial market. In developing economy, where there is a low level of information system infrastructure, it is very difficult to access financial information, and hence limits economic entities to access financial services. Information problems can be either ex-ante or ex-post. The ex-ante information problems are linked to adverse selection and moral hazard; while an ex-post problems lead to assurance services or expensive verifications. Hoff and Stieglitz (1990) classified the consequences of information problems within a financial market into three: (i) default risk determination; (ii) costs to ensure credit contracts; (iii) credit monitoring costs to ensure loan repayment. Information theory argued that financial services provision is an attempt to lessen these costs through promoting information access. Leland and Pyle (1977) observed intermediaries within the financial market as a coalition that facilitates access to information so as to minimize information asymmetries. Diamond (1984) indicated that the fast information dissemination help financial intermediaries to achieve economies of scale and thereby financial inclusion.

C. Rational Choice Theory

Rational choice theory is advocated by the neo-classical economists. It starts with examining the behavior of an individual making the decision, and this individual can be considered as a "representative" of a group in a financial market. Subject to this theory, demand for financial services generally involves the desire, nature and type, and condition under which financial

services are provided to users. Rational choice theory is based on the fundamental principle that the choices made by the individual are the best choice to achieve individual's objectives in light of all the uncontrollable factors. The demand for financial services is a function of the service characteristics, the behaviour of the service provider, and the decision-maker. This theory is criticized by its failure to consider that the success of the outcome of a decision is also influenced by the conditions that are not within the control of the decision maker. Nonetheless, this theory is vital in relating access to financial services as the characteristics of an individual to influence both the demand and supply dimensions, and thereby the level of financial inclusion.

D. Transactions Cost Theory

Transaction cost is a cost associated with gathering and processing of data to reach a decision. It constitutes transaction processing, negotiation, and policing and contract enforcement costs (Benston and Smith, 1976). The theory suggests that financial institutions are created to utilize economies of scale, access transaction technologies and leverage the benefits of information. Financial institutions play an important role in converting claims of one institution into another, and offer liquidity and diversify to their customers. However, the ease of achieving these objectives is determined by the cost of the transaction. Transaction costs are derived from a combination of bounded rationality and opportunism. Simatele (2021) argued that barriers associated with transaction costs and the nature of formal financial systems that rely on informational transparency exist and result in the exclusion of a large population from the financial sector, which in turn led to the existence of a parallel financial institutions that lie outside the formal sector. This has been one of the reasons for informal financial intermediaries serving a large number of borrowers, and hence it is necessary for a government intervention to reduce transaction costs and information asymmetry so as to raise the level of formal financial inclusion and realise sustainable economic growth (Benston and Smith, 1976).

E. Demand Following and Supply Leading Theories

Financial inclusion is mainly influenced by demand-side or supply-side factors. The supply-side perspective puts an emphasis on the features within the wider macroeconomic environment that foster financial inclusion (Arora, 2014). Supply-led hypothesis indicates that the financial sector influences the real sector (Levine et al., 2000). The supply leading hypothesis focuses on the

transfer of resources from the traditional and less productive sectors to the modern high-growth sectors and stimulates an entrepreneurial response (Patrick, 1966). This theory emphasizes the advancement of money as a driver for financial development, and finance leads economic growth instead of following it (Murinde and Eng, 1994). This implies that financial institutions and their services expected to occur before there is a demand for such service. Hence, it is fundamental for regulators and policy makers to inject money and introduce monetary strategy so that financial strategies promote a supply-driven budget reconstruction (Banerjee and Ghosh, 1998). The availability of financial services is, thus, crucial to stimulate the demand for financial services. Unlike the supply-led theory, the demand-following hypothesis gives emphasis on the characteristics of individuals towards financial services (Bhanot *et al.*, 2012). It facilitates the assessment and identification of factors that affect household demand for financial services, and thereby financial inclusion. In the demand-following theory, emphasis is placed on the economic growth and effective utilization of resources that leads to financial development. Robinson (1952) argued that "where business venture drives, finance follows" and suggested that financial development is simply a reflection or a response to the demand for financial services.

F. Endogenous Growth Theory

Solow (1956) was the key advocator of the neoclassical growth theory. His main hypothesis was the decreasing marginal returns, an exogenous increase in technical progress, and economic convergence to the initial conditions, i.e. zero long-run growth rates. In the traditional theories of economic growth, there is an assumption that the economic contribution of financial market development is transient. Later on the neoclassical growth theory was started to be questioned following the emergence of the endogenous growth hypothesis of increasing returns. A large number of economists exerted effort to develop this theory. Romer (1990) re-coined the existing theory and developed a new theory of growth based on the hypotheses of endogenised technological change. Central to the endogenous growth hypothesis is that economic growth is the result of internal factors rather than the external ones. It is built on the concept that innovation in capital (i.e., physical capital and human capital) lead to a higher productivity and growth. Romer questioned the various drivers of economic growth, and answered the question as increasing returns and promoted endogenous growth through innovation (Romer, 1986).

Romer (1986) revealed that the decisions of agents are critical to the long-run economic growth, rather than the external factors. In this view, innovation within the economic system has positive effects on productivity and per capita income. Consistent to the endogenous growth theory, the financial market development has long run and permanent impact on an economy and leads to a higher growth (Deabes, 2004). According to this theory, the long term economic impact of the financial sector development can be realised through raising the average productivity of capital, improving the process of financial intermediation in allocating investment funds, and improving domestic savings. Schilirò, (2017) argued that variation in saving rates explain differences in economic growth and income across economies. Advocators of this theory argue that there is a two-way causality between financial system development and economic growth, and hence long-run economic growth depends on policy measures. Thus, government policies should promote entrepreneurship, which is critical for the expansion of new businesses, and ultimately enhance the level of employment, investment, and innovation within the economy. In this regard, the government policy action on financial inclusion and stability is vital for creating a pleasant business environment.

2.1.2 Theories of Financial Stability

Financial stability is central to the efficiency and effectiveness of a financial market as well as an economy. Financial stability gives the foundation for rational decision making on saving and investment. Financial instability, on the other hand, creates uncertainties and leads to misallocation of resources, which in turn results in market failure. In extreme cases, financial instability has adverse effect on the socio-economic environment of a country. Since the financial crises of 2007/08, financial stability became one of the major areas of debate among scholars and policy makers in both the developed and emerging markets (Beck et al., 2007). Financial stability (FS) is mainly linked to the ability of an economic system to manage risks through absorbing shocks and ensuring the efficient allocation of resource across the various economic sectors (Houben, Kakes, and Schinasi, 2004).

Financial stability consists of three different dimensions, namely financial market, financial institution, and financial infrastructure (Houben et al., 2004). Instability in any of the above dimensions results in the overall financial sector instability of a country, which would have an

impact on the overall economy. Minsky (1977) identified information asymmetry, irrational behavior, and other market imperfections as the major causes of instability. Instability has a strong linkage with social behavior and psychology of individuals and economic forces such as competition and economic policies and thus, financial sector regulators are expected to strictly follow the business environment and take a proper measure so as to ensure stability in the financial system (Tymoigne, 2006).

A. Cyclical and Monetarists Theories

Scholars examined the causes and consequences of a financial instability and identified two well-known theories: the cyclical and monetarists. Instability usually arises when some favourable event raise the prices of assets after a certain period of time is elapsed since the last financial crises occur and investors become greedy (Minsky, 1977; Kindleberger, 1978). Increase in the price of stock lead to further investment with an anticipation that the current price will continue to rise in the future, which is known as the bandwagon effects, and profits from the business drive speculators to invest further. When prices reach their peak, or some external events erode the confidence of investors, prices start to fall, with catastrophic effects on financial intermediaries. This is in line with the classical economics who believed that financial system has no consequences on resource allocation, and instead emphasizes on the forces that lead to equilibrium rather disequilibrium, and attributed financial instability to external shock and abnormal behaviour (Kindleberger, 1978; Minsky, 1992).

Unlike the cyclic thought, the monetarists argue that financial instability arises due to disruption in the money supply, and the main causes of financial instability are mistakes in monetary policy that either initiate financial instability or cause disruptions that may have socio-economic consequences. Schwartz (1986) expressed such disturbances that are not linked with a decline in the quantity of money as “pseudo-financial crises”. Nonetheless, neither cyclic nor monetarist theories are satisfactory to address the issues of financial stability. On one side, the cyclical theory links financial stability to only irrational behaviors, which has no support from a microeconomic theory as to why economic agents behave in such a way that destabilizes the financial market? On the other side, the monetarist view is very narrow as it rules out the possibility of instabilities that arises from non-monetary causes

(Gertler, 1988).

Other literatures raise the importance of differentiating between monetary and financial stability. Monetary stability commonly refers to stability in the general price level or absence of an inflation or deflation. Financial stability, on the other hand, refers to the smooth functioning of the financial system. Financial instability is, thus, fluctuations in the prices of financial assets or inability of financial intermediaries to meet their contractual obligations, which leads to a weak economic performance. The above definitions clearly indicate that the two terms have something in common; but the two phenomena are not the same. Financial stability, thus, needs the attention policy makers as a public policy concern so as to promote the proper functioning of the financial system, and hence have a positive effect on market prices (Cukierman, 2013).

In some cases, financial system became a channel that transmits instability to other sectors by disrupting the financial sector activities. Literatures show that rise in competition erodes market power, decreases profit margins, and reduce contract value beyond the book value, which encourages financial institutions to take more risk so as to increase returns (Keeley, 1990 and Carletti and Hartmann, 2003). Such an incidence may lead to a financial system fragility which influences financial regulators to develop policies that help maintain stability. In most cases, financial instability demonstrates itself either in financial sector fragility or excessive price volatility of financial assets. However, financial instability is not the same as crisis, but a number of scholars emphasised on the extreme cases of disruption (instability) in financial markets (Kindleberger, 1978).

B. Competition-fragility and Competition-stability

Other theories that are linked to the financial instability are competition-fragility and competition-stability. The competition fragility theory assumes that there is a negative association between competition and stability. It argues that excess competition erode the market value of financial institutions, leading to engage in more risky businesses. Hence, intense competition has negative influence on market power and profit margins of financial institutions (Koetter, Kolari, Spierdijk, 2012). Such incidences lead financial institutions to take more risks with the intention to raise return (Hellmann, Murdock, and Stiglitz, 2000). On

the other hand, the competition-stability hypothesis assumes a significant positive relationship between competition and stability, and argues that weak competition leads to high interest rates, which in turn leads to adverse selection and moral hazard problem through increasing the ratio of non-performing loans (Koetter et al, 2012). On the basis of this theory, market power may raise financial risks as rise in the interest rates reduces loan repayment and results in adverse selection problems (Boyd and De Nicolo, 2005). However, although market power results in risky loan portfolios, the overall risks of financial institutions may not increase if these institutions protect their market values by raising additional equity and engage in other risk-mitigating techniques.

2.1.3 Financial Inclusion and Financial Stability

Financial inclusion influences resource mobilization and liquidity position of a financial system and minimizes the likelihood of a financial instability. Fluctuations in the economic activities may have different consequences. Schumpeter (1911) argued that fluctuations in the economy may affect the efforts of financial institutions to introduce new services, products, processes and management style. Inclusive financial systems cannot be achieved without stability in the financial system, whereas it is difficult to attain financial stability, while a large segment of the population is financially excluded (Khan, 2011). Hence, financial stability is a key to the health of an economy and to the proper functioning of financial markets (Klemkosky, 2013). It is, thus, the base for rational decision in resource allocations.

Kindleberger (1978) was the first to explore the relationship between stability and efficiency of financial institutions. One of the main reasons for exploring the link between the above two factors is because of the existing perception that the competitiveness of financial institutions is linked to efficiency in operations and resource allocation and optimal risk management. In line with his opinion, financial instability is a negative influence of financial sector on economic growth and loss of confidence and trust on institutions could negatively affect the degree of financial inclusion and institutional closures, which leads to investment failure. Financial stability is, therefore, crucial for a sustainable economic growth.

Minsky (1991) argued that economic growth is assumed to develop riskier behaviours across financial institutions and promote economic speculation, which leads to instability. Minsky (1992),

in his Financial Instability Hypothesis, stated that for all economic units, firms or individuals, there are three income-debt relationships that explain how financial crises arise, and these are hedging, speculation, and Ponzi finance. Instability of the financial system may cause macroeconomic costs, as it negatively affects investment, production and consumption, and hinders broader economic objectives. Kindleberger (1978) and Minsky (1991) both argued that financial instability leads to weak investment due to the loss of trust and confidence on financial institutions, which have a negative influence on economic growth.

Financial stability is critical to make rational decision in resource allocation (Crockett, 1996; Klemkosky, 2013). On the other hand, financial instability creates uncertainties with a significant negative implication on the market operation (Crockett, 1996). Considering this fact, there are scholars that argue financial stability should be considered as a public welfare (Blot, Creel, Hubert, Labondance, and Saraceno, 2015). Literatures identified three ways by which financial inclusion contribute to financial stability. First, credit diversification to smaller firms could reduce the overall risk exposure of banks. This, in turn, reduces the level of loan concentration on a single borrower in the overall portfolio and its volatility. Second, increasing the number of small depositors improves the volume and stability of deposit, which reduces dependence on "non-core" financing, which is a relatively volatile during crisis. Third, an inclusive financial system contributes to a better monetary policy transmission, which in turn contributes to financial stability (Khan, 2011).

Poor individuals and small businesses with no financial history and lack of collateral increase the riskiness of service delivery, which leads to financial instability (Bagehot, 1873). Thus, financial institutions should lend against good collateral, indicating financial services expansion to the poor is critical to stability. Instability of the financial system results in economic shock, which in turn reduces income and financial exclusion to some groups of the people. Garcia (2016) and Mehrotra and Yetman (2015) promote the view that financial inclusion affects financial stability. Financial inclusion involves low income population, with no financial record, which leads to information asymmetry and inefficiency of the financial system. Financial inclusion encourages local financial institutions with poor governance and regulatory systems to participate in the business, which exposes these institutions to take risks and face financial problems. In addition, the use of financial

technologies such as mobile and online banking in the absence of a proper supervision and regulation leads to financial instability.

In spite of the above facts, the level of financial inclusion in Sub-Saharan Africa is at its infant stage and a significant proportion of the population is still unbanked and the majority of the people are under the low level of income group. On the other hand, financial inclusion is believed to promote investment and economic growth, which is very challenging in the region due to the low income and problem of financial infrastructure. Increase access to financial services, especially credit facilities, to low income people with no financial record may results in default and hence there is a growing debate on the relationship between financial inclusion and financial stability. More empirical studies are, thus, important to examine this relationship and identify the reality.

2.1.4 Financial Inclusion and Economic Growth

In earlier economic theories labour, capital, and entrepreneurship have been the critical factors of production. In this case, the importance of finance has been ignored and the market is assumed perfect and there is no transaction cost for credit and deposit. In most of the old theories, the importance of a well-developed financial system to mobilize saving and channel fund for viable economic activities has been left-out. Hence, very little attempts have been made to identify the nexus between finance and economic growth. However, modern economic theories started to advocate the importance of finance and financial system development as a tool that creates an enabling condition for economic growth.

Schumpeter (1911) was the first economist to argue that finance promotes growth and triggered to the development of a large number of literatures on this issue. Goldsmith (1969) and McKinnon (1973), the proponents of this theory, advocated that finance promotes growth, which is a supply-led hypothesis. In line with this theory, finance promotes innovations and entrepreneurship that enhances economic growth, and hence access to finance is the key to realize growth. In line with this theory, the financial sector helps mobilise financial resources necessary for investment activities thereby promote economic growth. Levine and Zervos (1998) identified three main channels through which financial inclusion influences economic growth: the level of intermediation, efficiency and composition.

Other literatures show that there are many ways by which the financial system can influence economic growth. First, financial system stimulates changes in ownership through intermediation among the different asset-holders. Second, financial institutions promote the efficient allocation of resources from a relatively low to a relatively more productive uses. Third, financial institutions contribute to the rise in the rate of capital accumulation through availing convenient environment for saving, investment, and transaction, which enhance the incentives to save, invest, and work (Patrick, 1966).

Inclusive growth is a major concern of most developing countries and policy makers. Studies show that a well-developed financial system has a great contribution to sustainable economic growth through channeling financial resources to its most productive uses (Levin, 2005). The causality between financial inclusion and economic growth can be expressed by supply-leading or demand-following or bi-directional hypothesis. In the case of a supply-led hypothesis, access and use of financial services is important to accelerate socioeconomic growth, which reduces poverty and enhance financial sector stability (Zins and Weill, 2016). Failure to obtain finance affects economic growth and raises the level of poverty. It prevents the low income group from using a financial services and investing in income generating activities. In contrast, easy access to finance and financial services encourages investment and stimulate economic growth (Neaime and Gaysset, 2018). Demand-following theory relates economic growth to financial inclusion through enhancing the demand for financial services. Robinson (1952) was the prominent advocate of this theory and argued that, in any case, enterprise leads finance. Unlike the above two contrasting theories, bidirectional hypothesis relates the two theories and indicate the complementarity of supply-leading and demand-following hypotheses (Demetriades and Hussein, 1996; Greenwood and Smith, 1997; Harrison, Sussman and Zeira, 1999). Others argued for the existence of an independent hypothesis that indicates no causality between a financial inclusion and economic growth (Lucas, 1988; Stern, 1989).

2.1.5 Financial Inclusion and Financial Sector Regulations

Financial innovation and integration have increased the speed and extent to which financial shocks are transmitted across countries and financial institutions (Davies and Green, 2008). The global financial crisis of the 2007–08 was a good example of inadequate regulations and supervision that

led to a large number of countries into economic crises, and called for the international regulatory body to strengthen the international financial system regulation (Danzman, Winecoff, and Oatley, 2017). Reform efforts of the time, especially the banking regulation, have substantially improved the solvency and liquidity of globally systemic banks (Aikman et al., 2018). Despite reforms in the business regulation and governance of major standard setting bodies (SSBs), there are still gaps on ensuring financial inclusion. The reform efforts have marginalised the issues that are particularly relevant to developing and emerging countries. As a result, changes in the regulatory and enforcement landscape of the advanced economies have significantly reduced the relationship between correspondent banks, particularly across Europe and Asia, and Africa and the Pacific (IMF, 2017).

Cognisant of the effect of financial instability on economies, no doubt exists about the importance of reforms to ensure stability and deepen the financial system. However, whether a financial sector expansion is translated into a financial inclusion remains unresolved and the question of all (Beck *et al.*, 2015). Interaction of financial inclusion and regulation is critical not only to ensure resource mobilization but also to ensure job creation and long-term credit for investment in low income economies. Financial regulatory agencies develop and implement regulations that help to ensure the safety, soundness and stability of the financial sector while boosting financial inclusion. Many SSA countries have made various efforts to reform their financial system and raise the economic benefits of the sector through an effective resource mobilisation and efficient allocation of resources (Khan *et al*. 2005). Most of these countries have adopted a financial regulations ranging from Basel I capital adequacy requirement to Basel III, in some cases (Anarfo, Abor and Osei, 2019). Despite this fact, the region is still characterized by high spreads, low competition and high transaction cost. Some of the reasons given to explain why spreads is high in most countries, despite competition, are high operational costs and lack of collaterals. Market concentration has also posed the problem of systemic risk, and financial inclusion becomes an area of concern (Anarfo, *et al.*, 2019).

Nexus between macro-prudential regulations such as capital adequacy may impact access to finance, thereby conflicting with the financial inclusion goals of the Sub-Saharan African economies. Rise in the level of capital adequacy reduces the capability of banks to provide

financial services, which leads to credit rationing and thereby negatively affecting financial inclusion (Anarfo, *et al.*, 2019). Despite the recent improvements, there are regulatory and supervisory challenges and capacity gaps to implement international financial standards in SSA countries (Ricardo, 2015). Banks are dominant in the financial systems of these countries and access to finance is still largely insufficient in the region and highly inclined to the high income group of the market, which requires additional regulation that expands the sector towards a more diversified system that involve various institutions, funding structures and roles. It also requires the gradual and selective adoption of rules and standards, and ensuring a continuous investment in capacity building (Ricardo, 2015).

Financial regulations that promote financial liberalization increase the level of competition, financial sector development and economic growth (Batuo *et al.*, 2018). Strengthening the legal, regulatory and supervisory of the SSA's financial sectors is crucial to promote a smooth financial intermediation. It helps to reduce the credit risk exposure and non-performing loans (NPLs) of financial institutions and resolve challenges of banks that cannot return to profitability, which is critical to enhance the confidence level of private investors in SSA. Improving recovery and resolutions in the SSA help to reduce funding costs and enhance financial intermediation, which in-turn raise financial service access at low cost and contribute for economic growth in the region. However, this require banks to prepare a recovery and resolution plans to be approved by finance regulators would help reduce uncertainty and create clear understanding on the crisis management scenarios.

2.2 Empirical Literature

2.2.1 Determinants of Financial Inclusion

The initial attempt to assess the factors that induce financial inclusion was made in 2007 (Beck, Demirguc-Kunt, and Martinez Peria, 2007), where-in this study's focus was to identify the determinants of banking sector outreach. Later on, the level of outreach and usages of banking services were used to determine the index of financial inclusion (Sarma, 2008). Since then, other studies included different aspects of financial services to identify the determinants of financial inclusion and various factors are identified as drivers of financial inclusion. Some of these factors are macro and others are micro factors, and hence researches done to identify the determinants of

financial inclusion were unable to fully address the issue and lack consensus. One of the challenges to measure the determinants of a financial inclusion is the absence of a universally accepted measurement. It is, therefore, important to undertake a comprehensive assessment to confirm the key determinants of a financial inclusion (Cámara and Tuesta, 2014; Siddik *et al.*, 2015; Naceur *et al.*, 2015).

Empirical studies on the determinants of financial inclusion as well suggest different things in different context. Lack of a universally accepted measurement techniques is one of the challenges to create a common understanding on the determinants of financial inclusion (Naceur, Barajas, and Massara, 2015). An examination of the factors that have a limited financial inclusion in Africa identified that low capacity of financial institutions in the supply side and low levels of financial literacy in the demand side as the major constraints (Oji, 2015). Research undertaken in developing economies has identified the determinants of financial inclusion as structural and policy factors (Naceur *et al.,* 2015). Structural features of financial inclusion constitute population size and density, per capita income, and the nature of the economy, which have strong influence on market size. Policy factors are identified as institutional frameworks and macroeconomic stability. Hence, financial inclusion is seen as a function of both policy and structural factors. Kim (2016) identified the rationales behind financial exclusion as the level of income, religion or race, costs of financial services, and level of financial literacy among the population.

Expansion in digital payments, mobile phones and internet penetration and change in government policies has raised financial inclusion (Demirgüç-Kunt, *et al.*, 2018). Evans and Adeoye (2016) used a dynamic panel regression technique to identify the factors that affect financial inclusion in fifteen African countries using data collected from the World Development Index. Results of the assessment indicated that GDP per capita, financial deepening, literacy rate, access to internet and the existence of Islamic Banking are critical for financial inclusion. However, real sector credit to GDP, population, savings rates, and inflation seems irrelevant for financial inclusion in Africa. Yorulmaz (2016) indicated that unemployment has a negative impact on financial inclusion, and thus confirming that the unemployed and irregularly employed can less likely be included in the formal sector. Employment in the formal sector is a good indicator of the degree of financial inclusion in the developing economies.

Allen, *et al.,* (2016) used multiple regressions to estimate and identify individual and country specific attributes of inclusive finance in 123 countries using a panel data collated from the Global Findex repository. The results of the model showed that distance of the services, political stability, cost of account operation and legal rights are identified as key derivers of financial inclusion. In addition, the study indicated that people who live in rural areas, poor and young people are the most likely financially excluded groups that needs policy interventions. Gebregziabher and Makina (2019) used a panel GMM approach to assess the macroeconomic drivers of financial inclusion in 27 African nations using a panel data collected from the World Development indicators and Financial Access Survey. The study used independent variables such as GDP per capita, domestic public sector credit, mobile phone subscription and share of the rural population. Results of the study indicated that GDP per capita and mobile phone subscription have a significant impact on the financial inclusion in Africa.

Kundu (2015) identified the demand side factors as important determinants of financial inclusion in India. In this study, financial literacy and access to financial products and services, such as savings, insurance, low cost credit, remittances and payments, low cost operations are identified as important to achieve financial inclusion. Yorulmaz (2016) constructed a financial inclusion index to measure the degree of financial inclusion for countries under the European Union. In this research, assessment was made to identify the relationship between the financial inclusion index and some selected macroeconomic variables in line with the demand-following hypothesis. The overall result of the study indicated that there is a significant positive association between the financial inclusion and the macroeconomic variables such as income and human development. However, the study identified a negative relationship with unemployment and inequality.

Oji (2015) assessed the major constraints of the financial inclusion in Africa and learned that limited capacity of financial institutions on the supply side and low levels of financial literacy in the demand side are critical to financial service expansion. Fungacova and Weill (2015) identified that higher income and education are important for higher usage of formal financial services in China. Fungacova, *et al.* (2015) examined the level of financial inclusion in China *vis. a vis.* other BRICS country and identified that the level of financial inclusion in China is better in terms of a formal account holding. However, it is low in terms of the formal credit. The Chinese prefer to

borrow from other sources compared to taking a formal credit. Tuesta *et al.*, (2015) revealed that education and income are major drivers of the financial inclusion in Argentina.

A weak financial sector and the existence of market imperfections have been affecting financial inclusion in Africa (Maimbo and Gallegos, 2014). Adalessossi and Kaya (2015) assessed the level of financial inclusion in forty-one African countries using variables such as the number of adults with outstanding mortgage, use of formal account and use of formal financial institution and found that twenty-seven countries have a low level of financial inclusion and majority of these countries are low-income. Adeola and Evans (2017) identified per capita income, broad money as a percentage of GDP, literacy, and internet access as the major determinants of financial inclusion in Africa. Information and communication technology (ICT) is identified as important drivers of a financial service expansion through reducing transaction costs and expanding areas of coverage for the financial institutions. As a result, a large number of financial institutions have partnered with telecom firms to expand the accessibility of their financial services (Lapukeni, 2015). Safaricom of Kenya can be cited as an example, which started M-PESA services and linked this service with the local financial service providers such as banks which speeded up the uptake of formal financial services.

Zins and Weill (2016) explored the drivers of financial inclusion in thirty-seven African countries and identified that sex, age, education and income has significant influence on financial inclusion in Africa. In this region, formal account ownership, savings, and credit are higher in men compared to females. In addition, age has a positive impact on owning bank account, savings and credit. A fragile finance sector and market imperfections generated by information asymmetry and weak competition, identified as the major factor affecting financial inclusion in Africa (Maimbo and Gallegos, 2014). In addition, the study indicated that countries with a low per capita and low rate of literacy seem to be excluded from a financial system. Adeola and Evans (2017) identified per capita income, financial deepening, literacy, and internet access, as the major determinants of a financial inclusion in Africa.

Wale and Makina (2017) assessed the factors that affected financial inclusion in eighteen SSA countries. In this study, bank account ownership and use of accounts for saving were taken as dependent variables and income, gender, age and education were considered as independent

variables. Results of the analysis show that age and education have a positive and significant relationship with the likelihood of owning a bank account. The study also identified that bank account ownership is higher in males than females. Ownership and use of bank accounts were high across the mid-aged groups of the people. Stijn *et al.*, (2016), on the other hand, identified that a weak regulatory framework as one of the impediments to financial inclusion. In this research, financial regulation is cited as one of the factors that can be taken as either a hindrance or facilitator to financial inclusion. Nurbekyan and Hovanessian, (2018) cited lack of infrastructure, poor institutional quality and weak collaboration, political and economic instability, low rate of financial literacy and high level of poverty as the major factors behind the low level of financial inclusion.

David, Oluseyi and Emmanuel (2018) used the error correction method (ECM) to assess the key drivers of financial inclusion in Nigeria. The study used a time series data that span between 1990 and 2016. In this study, the number of depositors with deposit money banks per 1,000 adults was used as a dependent variable and variables such as GDP per capita, financial deepening (M2/GDP), credit to MSMEs (micro, small and medium enterprises) and number of internet users were used as explanatory variables. The result of the analysis revealed that GDP per capita, financial deepening (M2/GDP), credit to MSMEs (micro, small and medium enterprises) and the number of internet users were the major drivers of financial inclusion in Nigeria.

Abel, Mutandwa and Roux (2018) adopted a logit model to assess and identify the determinants of financial inclusive finance in Zimbabwe. The result of the examination revealed that age, education, literacy, income, access to internet and public confidence are the key drivers of financial inclusion in the country. However, distance from financial institution and application requirements to open bank account are found to be insignificant for financial inclusion in Zimbabwe. Akileng, Lawino, and Nzibonera (2018) employed cross sectional survey on rural and urban adult inhabitants and used a multiple regression analysis to examine the major drivers of financial inclusion in Uganda. The results of the study revealed that financial literacy, age, and income are essential for financial inclusion in this country. Poonam and Chaudhry (2019), similarly, used primary data collected via questionnaire and a logit regression model to examine the factors that determine financial inclusive in India. In line with the result of the assessment, gender, age and

profession were found to have a negative but insignificant impact on savings. However, income has a positive and significant effect on savings and financial inclusion in India.

Asuming, Osei-Agyei and Mohammed (2019) applied a probit model to examine the key drivers of financial inclusion in thirty-one Sub-Saharan African countries. Secondary data were collected and used from an internationally reputed organization with open public database such as the Global Findex repository of the World Bank, World Development indicators and Heritage Foundation to assess and identify the major drivers of a financial inclusion. In their research, account ownership, level of savings and borrowing were used as a measure of financial inclusion. On the other hand, micro variables such as education, age, gender, ATM distribution and wealth status and macro variables such as IT infrastructure, GDP per capita, rural population and ease of doing business were the explanatory variables. The results of that study indicated that GDP per capita, ATM distribution and ease of doing business were important for financial inclusion.

Anarfo, Abor and Osei (2019) applied a mixed effect regression model to identify the effect of financial sector regulations on inclusive finance in Sub-Saharan Africa. In this study, secondary data were collated from the IMF (International Financial Statistics) and the WB (Global Financial Development Indicators) for the period of 1990 to 2014. The dependent variable was constructed from five indicators, namely number of bank accounts, number of automated teller machines, borrowers with commercial banks, depositors with commercial banks and number commercial bank branches. Capital adequacy ratio, bank z-score, financial regulation, loan to deposit ratio, Boone indicator and non-performing loans ratio of banks were taken as explanatory variables. The results of the study indicated that financial regulation (financial stability) and Boone indicator (competition) as important determinants of financial inclusion. On the other hand, bank credit to deposit ratio and NPLs was identified as significant drivers of an inclusive finance in Sub-Saharan Africa.

A simple regression on the effect of financial inclusion indicators on the performance of banks in Indonesia revealed that financial inclusion can improve banking business performance, i.e. return on asset (ROA) and net interest earnings (NIM), and concluded that it is possible for banks to earn more profit if the level of financial inclusion increases (Ditta and Saputra, 2020). In addition, the study indicated that the expansion of banks as one of the formal financial institutions is critical to

increase financial inclusion. Yadav, Sahu, and Maity (2022) evaluated the efficiency of Indian banks (both public and private sector banks) in fulfilling their mandates of financial inclusion, during the period of 2009/2010 to 2019/2020. A Data Envelopment Analysis was used to compare the critical role played by public and private sector banks in their financial inclusion initiatives. The result of the technical efficiency scores indicated that the private sector is more efficient than the public sector banks in raising the level of financial inclusion in India due to the slow adoption of a tech-based financial products and services.

Simatele and Mbedzi (2021) applied a descriptive and logit analysis to examine payment choices in Zimbabwe, which is a country that claims the existence of a near cashless society. According to this study, a strong preference for cash, coupled with cash shortages and inadequate infrastructure for electronic payments, has resulted in a multitier pricing system, with a significant premium for digital payments, which counters the heavily lauded benefits of mobile payments in the developing countries. On the basis of these findings, the authors argued that the demand-side bias in government policies will not effectively counter the persistent currency failures and the resultant inflation, that have a strong influence on payment choices, and recommended polices that will reduce merchant adoption costs and encourage use of digital payment instruments.

Esmael and Mohammd (2021) used a binary logistic regression to assess and identify the major determinants of financial inclusion in Ethiopia, specifically in the Afar Region. The result of the study revealed that majority of variables used in the analysis were found to be critical for financial inclusion in that region. Accordingly, interest rate, literacy rate, internet access, trust in financial institutions, collateral requirement, access to bank branches and ATMs are found to be important drivers of a financial inclusion in the Afar Region. However, variables such as religion, access to credit, and documentation does not seem critical for financial inclusion of the region. Desalegn and Yemataw (2017), on the other hand, examined the key drivers of a financial inclusion in Ethiopia. Consequently, the study indicated that gender, age, education, financial literacy, urbanization, living in the capital city, and expansion of formal financial services are important factors for greater financial inclusion in Ethiopia. In this study, it is found that involuntary and voluntary exclusions are higher and recommended a policy measure that could encourage the use of financial services and reduce gender, religious, and rural-urban gaps so as to improve the

financial inclusion in Ethiopia.

Alhassan and Yengeni (2022) used a two stage regression analysis, namely a principal component analysis (PCA) and panel fixed and random effects regressions, to examine the effect of a financial technology (Fintech) on financial inclusion in 36 African countries for the years of 2011, 2014 and 2017. The principal component analysis results of the study indicated that there is a low level of accessability, availability and usage of financial services in Africa. On the other hand, the panel fixed and random effect regression analysis results revealed that Fintechs have a significant positive effect on financial inclusion. Specifically, the use of mobile accounts has a significant positive impact on financial inclusion compared to the use of other digital payments from traditional bank accounts. In addition, macroeconomic factors such as economic growth and banking sector development have significant positive effect on financial inclusion, though to a lesser extent compared to the above factors.

Matsebula and Sheefeni (2022) used a VAR model and quarterly time series data of 2004 to 2019 to analyse the effect of output and inflation on financial inclusion (proxied by commercial bank branches per 100,000 adults). The results of the study indicated that financial inclusion and output have a significant positive relationship with financial inclusion in the long run. Simatele and Maciko (2022) applied an empirical approach to explore the factors that led financial service usage to lag behind financial service access using data collected from two rural provinces in South Africa. The result of the study indicated that distance and transaction costs from the supply-side and lack of employment, low and irregular incomes, financial illiteracy, and risk and trust perceptions from the demand-side were important factors, suggesting the relevance of investing in technology and expanding mobile money to overcome barriers related to distance and improve network and Internet reception in rural areas. In addition, it is important to reconsider the exclusive issuance of e-money by banks and encourage supermarket money markets, including the post-adoption financial education efforts to expand financial inclusion.

On the basis of the above research findings, it is possible to argue that financial inclusion plays important roles for the overall economic and business performances of a country. However, the empirical literatures above revealed that there are numerous factors that affect financial inclusion. Some of these factors have a macro nature and others are of micro factors. In addition, the factors

that drive financial inclusion vary across economy, indicating the need to design and implement policies and strategies that suite the specific requirements of an economy and the interest of economic players so as to enhance the level of financial inclusion in an economy.

2.2.2 Determinants of Financial Stability

Financial stability manifests itself either in fragility or excessive volatility. It has earned the interest of policymakers and academics after the sub-prime crisis of 2008. Over the past two decades, the institutional structure has been evolving as a major factor that alleviates the problem of asymmetric information and financial system difficulties. Financial stability is linked to the potential of a financial system to absorb shocks and limit their costs (Creel, Hubert, and Labondance, 2015). Several empirical studies that have assessed the determinants of a financial stability gave an emphasis on the banking sector stability (Sanya and Wolfe, 2011; Ali and Puah, 2018). In fact, research shows that a well-established and healthy financial system is helpful to expand financial services such as deposit and lending, and reduce transaction costs and overhead that have a significant impact on profitability and economic performance (Nguyen, 2020).

Ali and Puah, (2018) examined the determinants of bank stability in Pakistan and concluded that inflation and economic growth (GDP) have a negative and significant effect on bank stability, implying that an increase in either inflation or economic growth tends to decrease the stability of banks. A possible explanation is that the banking system in Pakistan was unable to predict the price adjustment on its services. On the other hand, the financial crisis of the 2007/2008 has affected the economic growth of the country which created an impact on stability of the banking system. Adusei (2015) and Pham, Dao and Nguyen (2021), however, suggested that a rise in inflation and economic growth has a significant positive effect on the stability of the banking system, which is contrary to the findings of the above research.

Siddik and Haron (2019) assessed the factors that affect the stability of financial institutions using data collected from 565 commercial banks that are found in 52 countries across the world. In their study, a dynamic panel data analysis was made using the maximum likelihood model. The result of the study indicated that an increase in capital ratio have a significant positive effect on bank stability while a higher regulatory pressure leads to a higher level of bank risk. In addition, they conclude that ownership concentration has a negative and significant impact on bank risk.

Shaddady and Moore (2019), on the other hand, assessed the link between capital requirement and financial stability in the European banking industry. The results of their study confirmed that there is a positive and significant relationship between the two indicators, i.e. banks capital regulation is positively and significantly correlated with stability. On the other hand, weak restrictions, deposit insurance and higher supervision have negative and significant effect on the banks' stability. Bouheni and Hasnaoui (2017) indicated that financial stability is circular and an increase in credit expansion increases risk-taking, and therefore rising capital regulation promotes financial stability.

Mishi and Khumalo (2019) applied a panel data estimation technique to examine the determinants of bank stability (solvency) within the South African banking sector by controlling for individual bank characteristics and market characteristics. The result of the study revealed that lending activities, capitalization and concentration affect stability (solvency) of banks. In addition, the presence of a financial crisis heightened insolvency, leading to instability, implying that bank management and researchers should take corrective actions to ensure proactive reaction to trends likely to cause banking instability.

Vo, Nguyen and Van (2019) examined the major drivers of financial instability in the developing countries, using a panel data for 17 developing countries over the period between 2000 and 2017. In this study, domestic credit growth was used as a proxy for financial instability. Common static models such as pooled OLS, fixed effect and random effect models were used to assess the indicators. The regression result of the study indicated that GDP growth rate, inflation, broad money supply, lending rate, return on equity and stock market index have positive and significant correlations with the credit expansion, supporting the Post-Keynesians theory. In line with this study, an easy access to credit may encourage financial institutions to engage in more risky projects, which may expose banks to high credit risk and to a low asset quality.

Al Salamat and Al-Kharouf (2021) used a multiple regression model to examine the factors that affect financial stability in 13 commercial banks listed on the Amman stock exchange (ASE) over the period 2007 - 2016. The empirical findings of the study indicated that inflation rate and debt ratio have a significant negative effect on the capital adequacy ratio of banks. On the other hand, growth in gross domestic product has a positive and significant effect on the capital adequacy ratio.

In contrast, return on equity and rise in economic growth (GDP) had a negative and significant effect on the non-performing loans, while inflation has a positive and significant effect on non-performing loans.

Pham, Dao and Nguyen (2021) assessed the determinants of banking sector stability in the East Asia economies and conclude that bank size, credit risk and market concentration have a positive and significant impact on the banking system stability. On the other hand, banks with a higher level of revenue diversification and liquidity risk leads to less stability. Consistent with the above findings, Van et al. (2021b) argued that a higher financial inclusion positively affect the stability of banks and the financial sector as a whole, and enhance revenue of banks. On the other hand, financial inclusion has a negative effect on the costs, but positively affects the market share of banks in the Asian economies.

Temesgen, Wondafarahu, and Badassa (2022) assessed the determinants of financial instability for 14 East and Southern SSA countries using a 25 years data and a dynamic GMM estimator. Results of the study indicated that financial instability index is negatively correlated with money supplies, debt growth, inflation rate, volatility of economic growth. Increase in the volatility of GDP gap growth rate leads to an increase in financial instability, implying that volatility of GDP was a driving force for financial volatility/crises. In addition, their study revealed that money supply has a positive effect on financial instability, implying that increase in money supply ratio increase financial instabilities. External debt to GDP ratio has a negative impact on financial instability index, indicating that developing countries use debt as a source of foreign exchange earnings in short run but it will increase financial turmoil or instability during debt repayment. On the basis of the findings, the study concluded that it is better to focus on macro prudential and contractionary policies so as to ensure the stability of the financial system (Temesegen *et al.*, 2022).

Generally, the empirical evidences above revealed that there are various macroeconomic and microeconomic drivers of financial stability. However, there is a mixed view on the relationship between financial stability and the different drivers of financial stability. In addition, the impact of each variable varies across regions and countries due to institutional, cultural and socioeconomic and regulatory factors. It is, therefore, critical for scholars and policy makers to examine and identify the various determinants of financial stability in the SSA countries before developing and

implementing strategies and policies that fit for the needs of the financial sector as well as the economy at large.

2.2.3 Financial Inclusion and Financial Stability

Several empirical studies examined the causality between financial stability and financial inclusion that generated mixed findings. Inconsistencies in the findings on the relationship between the two variables have been inspiring other scholars to conduct similar research on the relationship between the two variables in different context. It is, therefore, important to assess earlier empirical studies and understand the various views reflected on the relationships, i.e. whether financial inclusion promotes or hinders financial stability, and their policy implication on the link and possible trade-offs (Cihak, Mare, and Melecky, 2016).

Dabla-Norris *et al.*, (2015) used a general equilibrium model to show how reducing monitoring costs, relaxing collateral requirements and expanding access to credit increases non-performing loans, entailing a trade-off with financial stability. Rancière, Tornell, and Westermann (2008) argued that countries with a well-developed financial sector are characterized by both high growth and high volatility. Ahamed and Mallick (2017) used bank level data of eighty-seven countries across the world to examine the extent to which financial inclusion affects the volatility of the banks' return on asset and their Z-score. Results of the analysis show that financial inclusion improves bank volatility through reducing the volatility of returns on assets and increasing the z-scores. Tran and Nguyen (2020) identified positive and significant causality between financial development and financial stability (proxied by Z-score). However, the study indicated that financial inclusion has a significant and negative effect on financial stability (proxied by non-performing loans), thus reduces the financial risks.

Khan (2011) argued that financial stability and financial inclusion coexist and mutually complement each other. Financial stability is not sustainable if a large proportion of the population is financially excluded from the system. In the same manner, financial inclusion is not feasible in a situation where there are unstable and unsound financial institutions. Morgan and Pontines (2014) indicated that greater liquidity in banks leads to better financial stability through decreasing the probability of default. In addition, financial openness has a positive and significant effect on financial stability.

Han and Melecky (2017) examined the relationship between access to bank deposits and growth of deposits during crisis and concluded that access to bank deposits improve deposit base, which makes banks to be more flexible to crises. Financial inclusion through a broader access and use of financial services can significantly reduce withdrawals during times of financial stress. One of the limitations of this study is that it emphasizes on the dynamics of bank deposit in the events of financial crisis. In addition, access to finance is broader and financial stability extends beyond deposits. Al-Smadi (2018) used a Fully Modified Least Squares (FMOLS) technique to examine the correlation between a financial inclusion and financial stability in Jordan using a time series data for the period between 2006 and 2017. The regression results show the existence of a positive and significant relationship between financial inclusion and financial stability.

Siddik *et al.*, (2018) considered bank data to examine the effect of financial inclusion on financial stability and found that there is constant depositing and borrowing behavior across the low income customers, even in the period of financial crises, leading to a stable financial transaction. Morgan and Pontines (2014) applied both non-performing loans and bank z-scores to examine the effect of credit to small and medium-sized enterprises (SMEs) on financial stability, and identified that there is a positive and significant relationship between financial inclusion and financial stability. Stability of banks can be assessed by profitability and liquidity, which indicates the structure of assets and liabilities (Klaas and Vagizova, 2014). Bank instability in the medium term arises from insufficient capital, assets and liabilities, and associated credit policies that increases credit risk and the probability of losses. Size of capital determines the ability of banks to manage financial stability during crisis, which depends on the interbank credit market and share of current liabilities (Klaas and Vagizova, 2014).

Gómez (2015) concluded that financial instability in banks arises due to the insufficient liquidity and quality of resources, which are important as liquid funds take vital share in the structure of bank resources and help to meet the immediate needs of individuals and enterprises, including credit requirements. Instability of banks can also be connected with undercapitalization, poor quality credit portfolio, credit policy and insufficiently stable resource base. Aghion *at al.*, (2010) asserted that financial system deepening can improve liquidity constraints and ease long-term investment, reducing the degree of volatility on investment and growth.

Vo, Nguyen and Van (2021) used the Generalized Method of Moments (GMM) to assess the consequence of financial inclusion on banking sector stability in Asia. The result of the study revealed that financial inclusion has a positive and significant impact on financial stability in the banking sector. On the basis of the result, the authors concluded that financial inclusion contributes to rise in banks' revenue, market share and reduce costs. Feghali, Mora, and Nassif (2021) examined the relationship between financial inclusion, proxied by access to payment and savings accounts, and financial stability, and found that financial inclusion cause financial stability. However, credit expansion negatively affects stability. Pham and Doan (2020), similarly employed a generalized least squares (FGLS) estimator to examine the relationship between financial inclusion and financial stability in 42 Asian countries during the years of 2011, 2014, and 2017, and found a positive and strong correlation. Al-Smadi (2018) examined the impact of financial inclusion on financial stability and found a positive association between the two factors (financial inclusion and financial stability).

Contrary to the views that a financial inclusion promotes financial stability, there are studies that argued financial inclusion poses risks. Mehrotra and Yetman (2015) argued that recklessly credit expansion raises financial inclusion, which may causes uncertainty and financial instability. Rapid credit growth in the financial system may weaken the stability of a regulated financial system. De la Torre, Feyen, and Ize, (2013) found that the rise in financial inclusion, coupled with weak supervision, may have a negative impact on financial stability, especially in times of crisis. In some cases, banks may outsource part of their functions to reach smaller entrepreneurs, which may harm their brand and raise the level of reputational risk, and thereby financial instability (Khan, 2011).

Other empirical studies signal a negative influence of financial inclusion on financial stability. Morgan and Pontines (2014) argued that rise in private sector credit to GDP leads to a high possibility of financial instability. Sahay, Cihak, Diaye, Barajas, Mitra, Kyobe, Mooi, Yousefi (2015) examined the overall effect of financial inclusion, which combines financial depth, access and efficiency on economic growth and financial stability, and found a significant negative consequence on financial stability, and argued that countries with weak financial industry oversights and compliance to regulatory provisions is positively linked to a decline in financial

business buffers. On the other hand, access and use of non-credit financial services does not adversely impact financial stability and the effects are still inconclusive.

Kaminsky and Reinhart (1999) concluded that financial instability has a positive association with the financial development, implying that identifying areas of vulnerabilities within a financial system and addressing their impact is essential for financial development. Some of these vulnerabilities include changes in individual and corporate sector balance sheet items and developments in asset and credit markets, which have the potential to raise the level of financial risk in the economy.

In general, the empirical literatures on the relationship between financial inclusion and financial stability show a rather mixed result. On one hand, there are scholars that hypothesis positive and strong relationship between the two variables. In line with the views of these researches, financial inclusion increases the resource base and amount of financial resources available for transaction and investment. Other academics however argue that financial inclusion affects financial stability as there are potential customers that have no track record on financial transaction and who have a low income to repay debt may affect the operation and stability of formal financial institutions.

2.2.4 Financial Inclusion and Economic Growth

Several studies tried to identify the relationship between financial inclusion and economic growth. Most of these researches confirmed that a rise in the level of financial inclusion has a strong contribution for socio-economic development in many countries. Financial inclusion influences economic growth by improving the average productivity of capital, channelling investment funds to businesses and increase savings. Norris et al., (2015) examined the impact of easing financial inclusion constraints, such as transfer, borrowing, payment and intermediation costs on economic growth (GDP) and inequality for low-income countries, and the result revealed that minimizing the effect of the stated constraints increases the level of financial inclusion, which in turn raises the level of output (GDP). Zhang (2015) examined the impact of rules and regulation on financial inclusion in the UK and China, and identified that it is necessary to streamline consumer protection laws so as to gain the trust of the excluded segment and promote growth.

Elias and Worku (2015) used a Vector Error Correction Model (VECM) and a Johnson Cointegration and Granger Causality Approaches to analyze the causality between economic growth and domestic savings in the East African countries for the period of 1981 to 2014. Their empirical analysis result suggested a positive and significant relationship between these variables in the context of Ethiopia and Uganda, but no significant relationship was observed for Kenya. In addition, the Granger Causality test between the economic growth (GDP) and gross domestic savings revealed uni-directional causality for Ethiopia and Uganda. Given their findings, gross domestic product (GDP) does Granger Cause gross domestic savings (GDS), which implies that economic growth accelerates gross domestic savings in the two countries (Ethiopia and Uganda).

Wyk and Kapingura (2021) applied the Johansen Cointegration, Vector Error Correction Model and Granger Causality analysis to examine the relationship between savings and economic growth in South Africa for the period of 1986 to 2018. However, the result of their research indicated that, in the long run, saving has a negative effect on economic growth in South Africa because of the low rate of domestic savings and relying more on foreign savings in the form of foreign direct investment (FDI), official development assistance (ODA) and cross-border bank flows. On the other hand, saving has a positive effect on economic growth in the short-run. In addition, the Granger causality tests revealed that the relationship runs from economic growth to gross domestic savings, promoting the importance of raising investment if the country is to a achieve a sustainable economic growth.

Subrahmanyam and Acharya (2017) used a multiplier model to show that financial inclusion creates more output in the case of supply leading strategy than a demand following hypothesis. The research clearly demonstrated that financial inclusion creates a faster growth when supply leading strategy is adopted as an integral component. The authors indicated that a greater access to formal credit increases self-employment. Sahay *et al.*, (2015) identified that access to financial services and increasing the participation of women has a strong positive impact on economic growth. Fan *et al.*, (2018) found a significant bidirectional causality between trade openness and financial development in China, indicating the complementarity of ‘demand-following’ and ‘supply leading’ hypotheses, and encourages regulators to further undertake a financial reform that promote trade developments.

Yorulmaz (2016) measured the extent of financial inclusion across the members of the European Union and candidate countries using a financial inclusion index in line with the demand-following hypothesis. In this study, the author examined the link between the financial inclusion index and other macroeconomic variables, such as GDP per capita, rural populations, literacy rates, unemployment rates, Gini coefficients, and human development index. The findings of the research revealed a positive and significant relationship between the financial inclusion index, and income and human development index but a negative association with the unemployment and Gini coefficient. Valickova *et al.*, (2015) reviewed sixty seven studies that investigated the relationship between a financial development and economic growth and concluded that studies with endogeneity effect tend to overstate the impact of finance on economic growth.

A sizeable number of studies concurred that there is a non-linear inverted U-shape relationship between finance and growth, indicating the existence of a turning point in the effect of finance. Sahay *et al.*, (2015) found a strong positive relationship between access to finance and growth. In addition, the study indicated that the relationship between financial depth and economic growth is a bell-shaped, suggesting that there is a threshold where the returns to growth fall as depth increases. Cecchetti and Kharroubi (2012) identified that the turning point of growth in terms of private credit is close to 90% of GDP. Law and Singh (2014) analysed the relationship between finance on growth for eighty-seven developed and developing nations using data for the period of 1980 – 2010, and found that finance promotes growth until the threshold of finance to GDP reached about 88%. Otherwise, the impact of finance on growth will turn to be negative as the financial development exceeds the threshold.

Babajide *et al.*, (2015) conducted a study on the effect of financial inclusion on economic growth in Nigeria and found a positive and significant impact of financial inclusion on the total factor of production and capital per worker, which has a positive impact on the final output of the economy, suggesting a proper harnessing of natural and economic resources to diversify the dependence on monoculture economy. Onaolapo (2015) examined the effects of financial inclusion on the economic growth of Nigeria and identified that financial inclusion has a positive and significant relationship with economic growth. In this study, it is identified that branch network, loan to rural areas and small enterprises has strong influence on poverty reduction and financial intermediation.

Norris *et al.*, (2015) assessed the factors that limited financial inclusion and examined their impact on economic growth (GDP) and inequality. The result of their study confirmed that financial inclusion improves savings, which has a greater contribution to investment. It enhances savings for borrowers who have an interest to finance economic activities, increasing total output. Financial inclusion boosts growth by enhancing savings and diversifying the sources of finance among economic agents. Bruhn and Love (2014) used a natural experiment in Mexico and argued that expanding the financial services raises the income of individuals by creating a conducive environment for the informal business owners to expand their businesses and create additional employment.

Lenka and Sharma (2017) used a time-series data for the period of 1980 to 2014, and assessed the effect of financial inclusion on economic growth, as measured by GDP per capita. In this study, the authors used the Principal Component Analysis (PCA) to construct a financial inclusion index, which comprises six indicators of financial inclusion. The results of their analysis indicated the existence of a positive association between financial inclusion and economic growth both in the short and long run. Mehrotra and Yetman (2015) used account ownership and saving deposit at formal financial institutions to assess the link between financial inclusion and economic growth for one hundred thirty countries and found that the level of aggregate consumption volatility is low in countries with high level of financial inclusion.

Pierre *et al.*, (2017) used a two financial inclusion indicators (financial services penetration and use) to examine the causality between financial inclusion and economic growth in the West African Economic and Monetary Union (WAEMU) for the period of 2006 to 2015, and concluded that there is no causality between economic growth and financial inclusion at a scale between two to four years,. However, there is bi-directional causality between economic growth and financial inclusion when the scale is four to eight years. Policy makers should, thus, make decision in favour economic growth, which seems decisive to ensure financial inclusion.

The IMF (2017) assessed whether financial inclusion meets multiple macroeconomic goals and stated that financial inclusion increases economic growth up to a point. A greater access to the various financial services, and with women involvements in these services, leads to a higher economic growth. In addition, sectors with external finance grow more rapidly in countries with

large financial inclusion. However, the marginal benefit of growth diminishes as both inclusion and depth increase. Makina and Wale (2019) used a panel GMM to examine the relationship between financial inclusion and economic growth using a panel data of 42 Africa countries. Data used in the study were taken from the World Development Indicators spanning 2004 to 2014. Real GDP per capita is used as a dependent variable while the explanatory variables include the ratio of credit to the real sector to GDP, number of branches per a thousand individuals, proportion of government consumption to GDP, ratio of enrolees in primary school and the ratio of total trade to GDP. The results of the study showed that an inclusive financial system promotes economic growth.

Balele (2019) used a panel data of twenty five Sub-Saharan African countries over six years (2009 – 2014) to examine the impact of financial inclusion on economic growth in Sub-Saharan Africa, and found a positive impact of financial inclusion on economic growth, implying the Sub-Saharan African countries needs to focus on financial service expansion and leveraging innovation to increase economic growth. Another study identified is that gross domestic saving and school enrolments have a positive impact on economic growth (Hanif and Arshed, 2016). Pasali (2013) used an endogenous growth model and supply-led hypothesis to examine the relationship between financial inclusion and economic growth, and identified that gross savings and primary school enrollment are the main drivers of economic growth.

Ibrahim and Olasunkanmi (2019) and Nanziri (2016) argued that a high level of investment, employment and income, and low-poverty rate are often associated with a high level of financial inclusion, and concluded that economic growth can be sustained only if the large proportion of the population has greater access to formal financial services. Sethi and Acharya (2018) examined the relationship between financial inclusion and economic growth in both the developed and developing countries for the period of 2004 to 2010, and found the existence of a bi-directional causality between financial inclusion and economic growth. Their findings confirmed that a financial inclusion promotes economic growth.

Dahiya and Kumar (2020) used the three dimensions of financial inclusion, namely usage, accessibility and penetration, and examined the impact of financial inclusion on economic growth. In this study, a panel data was used for the period of 2005 to 2017. Results of the assessment

revealed that financial inclusion has a positive and significant impact on economic growth. Kim, Yu, and Hassan, (2017) used a panel GMM approach to examine the relationship between financial inclusion and economic growth in the Organization of Islamic Countries (OIC) for the period of 1990 to 2013. The results of the examination revealed that, despite disparity in the level of financial inclusion across the countries, financial inclusion promotes economic growth.

Kapingura, Mkosana and Kusairi (2022) employed a Cross-Sectional Augmented Autoregressive Distributed Lag (CS-ARDL) model to examine the effect of financial sector development on macroeconomic volatility in the Southern African Development Community (SADC) region for the period of 1980 to 2018. The result of the study indicated that banking sector indicators and capital market development have a significant negative effect on economic growth volatility in the SADC countries, suggesting that a well-developed capital market and banking sector are important to mitigate macroeconomic volatility and recommended policies that promote the development of the entire financial system.

Empirical evidences above suggest that a large and deep financial systems help to diversify risk and reduce vulnerability to external shocks, which leads to low output volatility. However, financial inclusion may lead to financial stability that may affect economic growth. Despite these facts, the literatures on the association between financial inclusion and economic growth show that financial inclusion has a positive influence on the performance of the economy up to a certain level, which varies from economy to economy. Hence, determining the optimal level of financial inclusion is critical to enhance liquidity, promote investment and economic growth in both the developed and developing economies.

2.2.5 Financial Stability and Economic Growth

A few scholars attempted to assess the impact of financial stability on economic growth. Majority of these scholars emphasises on the relationship between bank stability and economic growth. Despite some deviations, many of the scholars support the argument that there is a significant positive causality between financial stability and economic growth (Havi and Enu, 2014 and Ibrahim and Sare, 2018). Tosunoglu (2018) applied Autoregressive Distributed Lag (ARDL) cointegration technique to examine the relationship between financial stability and economic growth in Turkey for the period between 2002 and 2017. In this study, financial stability indicators

such as financial leverage, capital adequacy, asset quality and liquidity ratios were used as regressors. The empirical results of the study revealed that there is a positive and significant relationship between the indicators of financial stability, specifically financial leverage, capital adequacy, asset quality and liquidity, and economic growth suggesting that a smooth functioning of the financial system is critical for a sustainable economic growth.

Sonmez and Uysal (2018) examined the effect of financial instability on the economic growth performance of BRICT (Brazil, Russia, India, China and Turkey) and learned that financial instability hinders the economic performance of these countries. Specifically, the panel causality analysis suggested that financial instability has unbearable effects on the economic growth of the stated economies. Nasreen and Anwar (2018) similarly employed a panel cointegration technique to test the long-run relationship between financial stability and economic development in five South Asian economies over the period of 1980 to 2012. In the same study, the Human Development Index is used as a proxy for economic development, while financial stability is measured by constructing a financial stability index. The study shows that financial stability has a positive and significant impact on economic development and concluded that a stable financial system is vital for the economic development of the region in the long-run.

Yonusi and Nafla (2019) assessed the relationships between financial stability, monetary policy and economic growth across 40 developed and developing countries using data collected for the period between 1993 and 2015. In this study, fixed and random effects panel data regressions were used to examine the relationship. In this research, financial development and stability indicators as well as monetary stability measures were used as explanatory variables while GDP per capita was used as the dependent variable. Result of the study revealed that financial crisis, bank reserves and non-performing loans have negative impact on financial stability, financial development and economic growth. The findings assert that there is a complementarity between the real sector and financial sector soundness.

Ntarmahet *et al.,* (2019) employed a fixed and random effect models to estimate the effects of the banking system stability on economic growth in 37 developing economies for the period of 2000 to 2016. The findings of the study showed that bank Z-scores have positive effects on the economic growth of developing countries, while a bank regulatory capital and bank credit have negative

effects on economic growth. Nguyen and Thi Du (2022) used a sample of 102 banks in six Asian countries over the period between 2008 and 19 and found that the financial inclusion has a positive relationship with stability (Z-Score) and a negative effect on the deposit growth rates and nonperforming loan ratio, indicating that a rise in financial inclusion contributes to a more stable deposit and safe loans, and hence stable banks.

Eweke (2019) used banking stability index, return on assets, financial depth and interest rate to assess their impact on economic performance of the Nigerian economy for the period between 1986 and 2016. The study employed the ARDL bounds cointegration test and the result indicated that there is a long-run relationship between the regressors and economic performance. Ma (2020) used both the Ordinary Least Square (OLS) and System GMM to empirically examine the relationship between financial stability and economic growth. The author also evaluated the effect of macro-prudential policy on small open economy. The result of the study suggested that optimal macro-prudential policy such as a higher capital adequacy ratio reduces financial instability. However, it has a weak negative effect on economic growth through reducing borrowings. In addition, results of the OLS and system GMM estimators revealed that the macro-prudential policies are helpful to mitigate the negative growth effects of unstable capital flows and limit the financial vulnerability as it helps to build a buffer.

Ngonyama, Mishi, Sibanda, and Makhetha-Kosi (2020) used a cross-country data and a robust panel data analysis technique to analysis the paradox of the nexus between financial depth, competition and economic performance. The overall result of the study indicated that an increase in the stock market prompts creation of liquidity. In addition, concentrations of bank assets and inflation have a positive impact on economic performance (GDP growth). On the other hand, bank regulatory capital to risk, bank ROA and bank remittance flows (brain drain) have a negative and significant impact on economic growth and GDP per capita. However, bank stability (Z score) has a negative effect on GDP growth only. The central bank assets to GDP have a positive effect on economic growth, which is not the same for GDP per capita. Moreover, the bank regulatory capital risk has a negative relationship with GDP growth. In general, there is a close relationship between the financial system's overall complexity and economic performance, indicating strong implications for both policy and future research.

Shabir, Jiang, Bakhsh, and Zhao (2021) used bank Z-score as a measure of banking stability and examined the effect of economic policy uncertainty on bank stability using a bank-level panel data of 1481 banks in 24 countries for the period of 2005 to 2019. According to the findings of the study, a policy uncertainty decreases bank stability. However, the author argued that the impact differs across banks and market structure. In addition, it indicated that the economic policy uncertainty has an adverse consequence on bank stability in all countries irrespective of their level of development and GDP per capita. Hence, the findings suggested the importance of institutional quality to mitigate bank instability.

Financial liberalization can be the other channel through which financial instability can be created in the domestic economy. Nolungelo and Kapingura (2018) used data from four of the South African Development Community (SADC) countries, and indicated that financial reforms are positively related to financial instability in almost all the specifications, which also further revealed that financial instability intensifies in the face of a financial crisis, suggesting that financial liberalization is the other source of financial instability in the region. On the basis of the findings, the study recommended that though policymakers should liberalise the financial system, it is necessary to adopt policies that promote financial stability.

On the basis of the literatures above, it is possible to conclude that financial inclusion is critical for a sustainable economic growth. On the other hand, a sustainable economic performance requires a stable and well-functioning financial system. Unstable and crisis-prone financial systems undermine the overall business activities of a country and impede economic growth (Somnez and Uysal, 2018; Eweke, 2019). It is, therefore, important to assess the key drivers of financial inclusion and financial stability, and identify the actual relationship between financial inclusion, financial stability and economic growth so as to develop appropriate policies and strategies, and enhance their overall economic benefits.

2.3 Chapter Summary and Conclusion

In this chapter, a detail theoretical and empirical literatures review was made on the key variables of the study, i.e. financial inclusion (FI), Financial Stability (FS) and economic growth (EG), and their relationships. Several theories were assessed to conceptualise and describe the intent of these variables. Several financial inclusion, financial stability and economic growth theories such as

information asymmetry, rational choice, transaction cost, institution and regulation, supply-leading and demand-following, finance-growth nexus and endogeneity-growth, competition-fragility and competition-stability, cyclical and monetarists, and others are reviewed and discussed to examine the concepts and intent of financial inclusion, financial stability and economic growth. However, the literatures reviewed confirmed that there are no universally accepted and standard definitions for the terms, financial inclusion and financial stability. One of the reasons for this is the broad and multidimensional nature of the variables.

On the basis of the literatures, several macroeconomic and microeconomic factors were identified as the key determinants of financial inclusion and financial stability across the various nations and regions. However, the literatures showed the existence of variations with no consensus on the findings of the key drivers of the stated variables. In addition, the literatures showed no consensus on the relationship between financial inclusion, financial stability and economic growth. Some scholars advocate unidirectional relationship and still others support a two-way relationship, which needs an in-depth analysis and empirical verifications. This indicates the need for further investigations and analysis on the major factors that drive financial inclusion and financial stability, and assess the short-and-long run relationships between the financial inclusion, financial stability and economic growth, and identify their direction of causality so as to ensure consistency and address the gaps in policies and strategies. The next chapter presents the conceptual framework on the three key concepts of this study.

CHEPTER THREE: CONCEPTUAL FRAMEWORK

3.1 Introduction

Chapter two provided the overall review on the theoretical and empirical evidences that are linked to financial inclusion, financial stability and economic growth from a broader perspective. The literatures reviewed above gave an overall insight on the concept of financial inclusion, financial stability and economic growth, and the empirical findings on the causal relationship between the stated variables. Unlike the previous chapter, this section gives special emphasis on the concepts of financial inclusion, financial stability and economic growth and examines the logical relationship between these indicators from the perspective of the selected SSA countries.

As stated in the background of the study, the sub-Saharan Africa is one of the developing regions with the lowest gross domestic product (GDP) and GDP per capita. It is also one of the regions with low financial inclusion with large disparity across economies. On the other hand, financial inclusion becomes a policy objective and strategy direction for the developing countries. In addition, expansion of bank accounts becomes the main gateway to achieve the objectives of financial inclusion (Demirgüç-Kunt *et al.,* 2018). Financial inclusion is linked with the increase in the number of customers and expansion of products and services, which serve as a basis for achieving the various dimensions of financial inclusion, namely accessability, availability and usage. Financial inclusion has an effect on the financial sector stability through the expansion of deposit and loan portfolio, specifically through increasing risk diversification (Musau *et al.,* 2018).

Increased access and use of financial products and services increase the efficiency and effectiveness of monetary policies in the SSA economies, and thus encourage governments to design and implement policies that expand financial products and services, and promote financial inclusion so as to maintain the monetary system stability (Jungo *et al.,* 2021). On the other hand, financial stability ensures that financial institutions become profitable and possess sufficient liquidity that helps to settle immediate obligations (Klaas and Vagizova, 2014). Financial stability reduces the negative effect of limited financial resources through credit policy leading to credit risk, and thereby losses. It ensures that there is sufficient capital to risk assets that guarantee reliability and liquidity, and high profitability demonstrating organisational effectiveness (Hodachnik, 2009).

In general, financial inclusion plays important roles in reducing poverty and narrowing inequality through ensuring the availability of affordable financial products and services, including savings, bank credit, insurance, and payments, which help improve households' living conditions (Owen and Pereira 2018; Zins and Weill 2016; Huang and Zhang 2020; Jungo et al., 2021). Given the multidimensional effect of financial inclusion, it is important to properly define the relationship between financial inclusion, financial stability and economic growth. The next section deals with the concept behind these three indicators and determines the logical link and the conceptual framework between them.

3.2 Financial Inclusion, Financial Stability and Economic Growth

A. Financial Inclusion

Financial Inclusion has no standard and universal definition due to its multidimensional nature. The World Bank (2014) defined financial inclusion as "a scheme by which individuals and firms have access to valuable and affordable financial products and services that meet their desires – transfers, payments, savings, credit and insurance – delivered in a responsible and sustainable way." This definition encompasses both the supply and demand side initiatives. Financial inclusion is also defined as the expansion of formal financial services such as deposit, credit and payments through bank account to a large segment of the population (Efobia, Beecrofta and Osabuohienab, 2014). It also refers to the accessibility, availability, and affordability of formal financial services to the society at large (Sarma and Pais, 2011). It is linked to the delivery of formal financial services that are adequate, timely, affordable and sustainable to all groups of the population (Sarma, 2008; Koker and Jentzsch, 2013). On the basis of the above definitions, it is possible to argue that the assessment of financial inclusion should examine both the supply and demand side dimensions (Beck and De la Torre, 2006). The supply side dimension is related to the availability of financial intermediaries and the conditions under which financial services are available, while the demand side dimensions is related to those factors that influence individual decisions to use financial services. Financial inclusion is also envisaged as critical to realise a stable financial system and a sustainable economic growth (Oteng-Abayie, 2017; Baidoo and Akoto, 2019)

Financial inclusion has become the focus areas of monetary authorities and governments with the

intention to address the challenges of financial stability and sustainable economic growth. Most financially excluded people are dependent on cash transactions, and hence financial inclusion is helpful to bring this group of people into the formal financial system and improve the effectiveness of the monetary policy transmission mechanism. Specifically, following the financial crisis of 2008, the interest to expand financial services has gained attention across the developing world. International organizations like the World Bank, IMF and AfDB have introduced the concept of financial inclusion as a priority task in their strategies and policies to achieve sustainable economic growth (Siddik, Alam and Kabiraj, 2018). The concerns are proper considering the possible cost forgone in economic growth as the level of access to financial services does not reach a large number of the population (Naceur, Barajas and Massara, 2015).

Sarma (2008) identified three major dimensions of a financial inclusion, namely accessibility, availability and usage, to assess the level of financial inclusion index in different countries. In this case, each dimension of the financial inclusion uses a specific measurement indicator. Access to financial services and availability are measured by bank account per 1000 populations and number of branches or ATMs per 100,000 populations, respectively. Usage of financial services is measured by the volume of credit plus deposit relative to GDP. Financial resource access and utilisation are the important factors of financial inclusion. Access implies both proximity and access to financial services. Account ownership and the ability to use financial products and services are important for the access dimension (Allen, Demirguc-Kunt, Klapper, and Pería, 2016).

Financial inclusion/exclusion can be voluntary or involuntary. Culture and religion are the most important motivational factors behind voluntary exclusion, while ineligibility, non-availability, financial illiteracy and cost are the major causes of involuntary financial inclusion (Kempson and Whyley, 1999). In this case, it is clear that financial exclusion is linked with social exclusion, which characterizes the contemporary forms of social marginalization. There are also several factors that influence financial inclusion in developing economies. Some of them are macro and others micro factors. GDP per capita, inflation, literacy rates, populations, unemployment rates, lack of information on banking products and services, interest rates, problem of national-identity, lack of awareness on the financial service terms and conditions, high transaction costs, and lack of access to service infrastructure are some of the macro factors that influence financial inclusion

(Dupas and Jonathan, 2012; Allen *et al*., 2016).

B. Financial Stability

Financial stability, like financial inclusion, is a broad concept, referring to the different aspects of the financial system — infrastructure, institutions, and markets. It refers to the soundness of financial institution, the stability of financial markets, the absence of turbulence, and low volatility within the sector (Schinasi, 2004). Obviously, financial stability is the absence of a financial crisis, but more importantly, it is the ability of a financial system to limit, contain and deal early on with imbalances that can potentially develop into a threat to the financial sector and the economy at large (Schinasi, 2004). While considering the concept of financial stability, one can understand that financial stability is a necessary condition for the optimal allocation of resources (Dyk, 2010). Financial stability is usually linked to systemic risk, which is a risk of disruption to financial services that is caused by an impairment of all or parts of the financial system with a potential to have negative consequences in the real economy (The Committee on Global Financial Stability (CGFS), 2010). The profitability of a financial institution is one of the measures of financial stability. Financial structure influences competition among financial institutions, which provides different incentives for risk management. Financial competition erodes the potential to involve in inter-temporal risk smoothing activities (Allen and Gale, 2004).

A financial system is in a range of stability whenever it is capable of facilitating the performance of an economy. Financial crisis, reserve requirements and non-performing loans has negative impacts on financial stability, financial development and economic growth (Yonusi and Nafla, 2019). Borio (2011) classified the financial sector risks into two dimensions, namely time and cross-sectional risks. The financial system risks that are linked to time require dealing with risks in the financial system that evolves over time due to a positive relationship between the economy and the financial system. On the other hand, the cross-sectional financial system risk dimension involves risks dealing with how risk is allocated within the financial system at a point in time as a result of common exposures and inter-linkages in the financial system. In both cases, it is necessary to understand the causes and possible consequences of the risks of the financial sector so as to prevent and manage potential losses.

C. Financial Inclusion Vs. Financial Stability

Increase in financial inclusion tends to enhance or worsen financial stability depending on the situation at hand. Scholars suggested both positive and negative scenarios that rising financial inclusion could affect financial stability. Often financial inclusion reduces the possibility of liquidity crunches and systemic risk through diversifying the sources of fund in the economy. Financial inclusion is also leads to financial crises through attracting low credit worthy customers to the financial system and resulting in credit default (Khan, 2011; Morgan and Pontines, 2014; Mehrotra and Yetman, 2015). However, increase in financial stability leads to an increase in financial inclusion. Financial inclusion has, thus, a mixed effect on financial stability. Greater financial inclusion enhances risk of diversification, which reduce the relative size of a single borrower in the overall portfolio and reduce volatility. Financial inclusion increases both the size and stability of the deposit base, which reduces dependency on limited depositors or source of finance and minimizes risks of liquidity and crisis. In this way, it contributes to a better transmission of monetary policy and financial stability.

On the other hand, financial inclusion results in a reduction in lending standards and increases reputational risk, which dilute the overall effectiveness of the financial regulation and increase systemic risks (Mehrotra and Yetman, 2015). Weaken financial sector regulations due to financial inclusion negatively affect financial stability and may result in economic crises. It is, thus, important to understand that financial stability requires a proper regulatory framework, effective financial markets and sound and efficient financial institutions.

D. Financial inclusion Vs. Economic Growth

The foundation to understanding the relationship between financial inclusion and economic growth could be traced-back from the works of Schumpeter (1911), Shaw (1973), and Mckinnon (1973). In line with the arguments of these scholars, the financial sector is one of the vital fundamentals in explaining economic growth patterns. In the distribution of available scarce resources, the financial sector plays an important part in providing affordable financial services, thereby fostering economic growth (Chen, Yuan and Gang 2021; Dahiya and Kumar, 2020; Sethi and Acharya, 2018 and Lenka and Sharma, 2017; Inoue and Hamori, 2016). In addition, the theory discussed a growth model that places an interest on innovative capital, intellectual capital and human capital in explaining economic growth differences across countries and over time (Chirwa and Odhiambo, 2018; Inoue and Hamori, 2019). On the basis of this economic growth model,

technological progress occurs through innovation; in the form of new products, processes and markets, and determined by economic activities. Efforts towards promoting financial inclusion lead to economic growth and higher welfare (Morgan and Pontines 2018; Kim, 2016; Neaime and Gaysset, 2018).

Innovation in financial technology adds to both observable and non-observable productions. Various studies recognise the role of financial services in terms of saving money, sending and receiving payments, which has a significant contribution towards enhancing economic activities (Ibrahim and Alagidede, 2018; Sharma, 2016). Financial technologies such as mobile money in the endogenous economic growth framework are helpful to facilitate smooth economic transactions (Srouji, 2020). Major channels that underpin the theoretical relationship between financial inclusion and economic growth include the provision of affordable and low-cost financial services to the poor and underserved groups so as to encourage more economic activities resulting in increased national output as well as improved wellbeing (Adedokun and Ağa, 2021 and Nanda and Kaur 2016), and the unbanked with possible access to deposits and insurance services will encourage the vulnerable to save in the bank and non-bank financial institutions, aiding the flow of funds to the financial markets. This guarantees efficient fund allocation into long-term investments leading to more productive output, raise employment, income redistribution and poverty reduction in an economy (Claessens and Perotti 2007 and Ramkumar, 2017; Yoko, 2010).

E. Financial Inclusion Vs. Financial Stability and Economic Growth

In line with the above discussions, financial inclusion has both positive and negative effect on financial stability. In addition, financial inclusion has a mixed effect on economic growth in developing economies like the SSA countries. Low cost access of financial services attracts the poor to utilize the service and reduces vulnerability and improve living standard (Rajan, 2009). Low-cost credit to the poor and vulnerable groups promotes investment activities, leading to more production, which raise the level of output and growth at national level and improve the standard of living of the poor through raising their income (Nanziri, 2016; Zhang and Posso, 2019). Universal access to saving and insurance products, on the other hand, raises fund in the financial market and the financial market allocate these funds into viable investment projects. This process enhances output and employment, which in turn improves the distributions of income and improve

the living standard of the low income group (Claessens and Perotti, 2007). Figure 4 below highlight the relationship between financial inclusion, financial stability and economic growth.

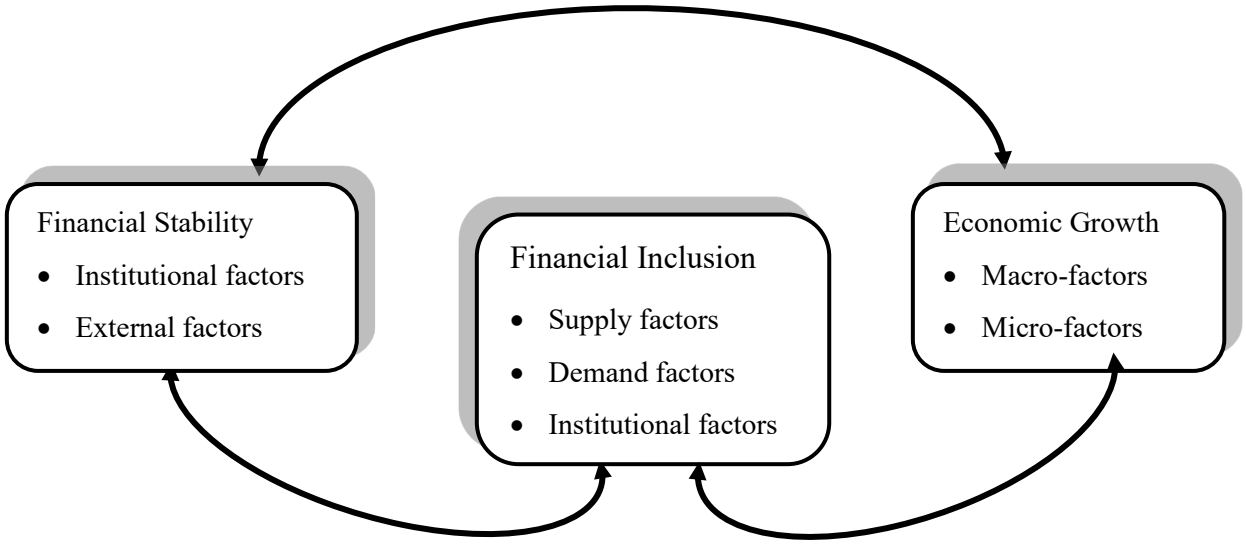

Figure 4: Preliminary Conceptual Framework

Source: Author's own conceptualisation

Financial inclusion promotes financial resource mobilisation, which enhances accumulation of resources for those investors with viable economic activities, leading to increased output and growth (Norris *et al.*, 2015; Ibrahim and Olasunkanmi, 2019). Economic growth raises income and promotes the need for financial services and financial inclusion. It also increases the number of users and volume of financial resources and liquidity. Timely fund transfers promote efficiency and minimize resource distortions that may be caused by financial frictions due to constraints linked to financial inclusion (Norris et al., 2015). A rise in the liquidity of the financial system improves financial stability, and enhances its capacity to prevent possible shocks. Financial inclusion and economic growth has two-way causality (Sethi and Acharya, 2018). On the basis of the above contextual diagram, it is possible to observe that there is a cause-effect relationship between financial inclusion, financial stability and economic growth. Financial inclusion enhances the potential of financial institutions to allocate finance for viable investment and thereby financial stability and economic growth. Economic growth raises the demand for finance and thereby financial inclusion, which help diversify portfolio and ensure financial stability.

On the basis of the above description, it is possible to assume that the three factors have interrelation and cause-effect relationship, which is consistent with the evidences and findings of

several other scholars who argue that there is by-directional (two-way) relationship between financial inclusion, financial stability and economic growth (Lewis, 1995; Sharma, 2016; Nakay and Yingnan, 2019). However, there are still several authors that argue uni-directional relationship between the stated variables. Such controversy can only be addressed through a properly designed empirical evaluation of the relationship that exists between the variables in different context. Given the above mixed findings, additional assessment on the relationship between the stated variables is, therefore, important to develop the right policies and strategies that help to ensure economic development and thereby prosperity in the region.

3.3 Chapter Summary and Conclusion

In this chapter, efforts were made to conceptualize the three important variables, namely financial inclusion, financial stability and economic growth, and identify their relationship in the context of the SSA countries. In line with the discussion above, financial inclusion can be expressed as a fair access and use of financial products and services in an economy. Financial inclusion is a broad and multidimensional concept. It has a significant role in raising the volume of saving in the financial system and promotes investment, and thereby financial stability and economic growth in different ways. On the other hand, financial stability occurs when a financial system is healthy and operates within the specified governance framework. It is essential to ensure a smooth functioning of the financial system to raise social welfare, and thereby economic growth. Economic growth improves the per capita income of individuals and households, which enhances the chance of saving and investment.

In the next chapter, this study unpacks the methodology adopted to address the key research objectives and related equations.

CHAPTER FOUR: METHODOLOGY

4.1 Introduction

In order to achieve the key objectives of the study and address the research questions, this chapter discusses the research methodology, including the research approaches, the data and its sources, the samples size and methods of data analysis. Moreover, the chapter explains the type of the research models applied, the econometric estimation techniques used and the diagnostic tests. Accordingly, the chapter is organised into six distinct yet coherent sections. The first section describes the research approach followed by the data and the sample size, as well as the periods under review. The third section explains on the variables selected and their previous application, while the fourth section outlines the econometric specification, which is the analytical framework, followed by the detail regression equations. Summary of the chapter is presented under section six.

4.2 Research Approaches

Scholars follow different approaches to assess the factors that affect financial inclusion and financial stability, and identify the relationship between financial inclusion and other variables. Some use qualitative techniques while others follow a quantitative approach, depending on the nature and type of data. A large number of studies made to assess the determinants of financial inclusion used a quantitative approach (Evans and Adeoye, 2016; Ajide, 2017; Gebregziabher and Makina, 2019; Naceur *et al.*, 2015). Several other researches made to identify the effect of financial inclusion on financial stability or economic growth used quantitative methods (Al-Smadi, 2018; Siddik et al. 2018; Balele, 2019; Makina and Wale, 2019). One of the motivations to employ a quantitative method is the difficulty to access primary data and evaluate the opinions of individuals.

In order to achieve the objectives and address key issues of the research, this study employed a quantitative approach. A quantitative approach generally focuses on an objective measurement using statistical, mathematical, or numerical analysis of data collected through polls, questionnaires and surveys. The approach can also innovatively use a pre-existing statistical data by deploying an appropriate computational technique. Quantitative research designs are either descriptive or experimental (Babbie, 2010; Muijs, 2010). In this study, both econometric and

exploratory research techniques are used to identify the determinant of financial inclusion and financial stability, and examine the impact of financial inclusion on financial stability and economic growth, simultaneously. A descriptive study is usually used to establish the associations between variables and an experimental study is applied to establish the causality (Babbie, 2010). Hence, both the descriptive statistics and econometric techniques are used to assess and explain the nexus between financial inclusion, financial stability and economic growth. Using these models, the study endeavours to explain the behaviour of all the variables and provided evidence in comparison with their earlier studies and subsequent analysis.

4.3 Data and Variables

Financial inclusion data can be either a supply-side or a demand-side. Supply-side data comes from the financial service providers, while the demand-side data is generated via interviews and observation of end-users, individuals, households, and firms. In this research, sector based and macro-economic data was used to achieve the objectives of the research. Unlike others that used primary data, this research employed a secondary data. The use of a secondary data highly contributes to the reduction of cost and time, and also provides the basis for comparison and easily addresses critical issues. Despite the benefits, scarcity of data has been one of the main challenges of most studies linked to financial inclusion. The secondary data was collected from international organisations such as the World Bank (WB), International Monetary Fund (IMF), the UN, as well as reports of the respective countries' central banks. Databases of the World Bank constitute data for nearly two hundred countries with a large number of financial and non-financial indicators. Some of these indicators are linked to financial inclusion, financial development, financial stability and economic performance. Thus, the study used a combined database of these institutions in order to address problems stemming from missing data for some financial and economic variables of the economies to be considered in this study.

Sub-Saharan Africa constitutes forty-eight nations that have various economic, political and financial features. In order to accomplish the objective of this research, emphasis was given to a sample of twenty-six (26) sub-Saharan Africa countries from all corners of the region with a data for the period of 2000 – 2019. In this regard, a mix of low and middle income economies was considered so as to examine the characteristics and nature of the relationships between the key

variables. In addition, the economic position, geographical location and data availability was considered in selecting the countries. The sub-Saharan African countries that are considered in this study include Angola, Botswana, Burundi, Cameroon, Chad, Democratic Republic of Congo, Equatorial Guinea, Ethiopia, Gabon, Ghana, Guinea, Kenya, Malawi, Mauritius, Mozambique, Namibia, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, South Africa, Tanzania, Togo, Uganda, and Zambia. It is well known that most of the Sub-Saharan African countries have comparable economic and social features. In most of the countries, it is possible to observe a low economic development, high poverty and inequality, high population growth, and high unemployment rate but untapped natural resources (Jungo *et al.*, 2021). In addition, there are a large number of adults without access to financial services (Demirgüç-Kunt *et al.*, 2018).

On the other hand, the socioeconomic environment of the region indicates that there is an economic system interaction between the informal and the formal system (Durango-Gutiérrez *et al.*, 2021). Commercial banks are the main players of the financial system, and deposits and loans are the critical instruments of financial intermediation in the region (De la Torre *et al.*, 2018). In the case of a missing observation, the study employed a moving average method to fill the missed observations. However, this research collected adequate number of observations for the variables financial inclusion, financial stability and economic growth so as to enable the study become more informative. A list of the variables used in this study, and their previous applications in similar studies are shown in Table 1 below.

Table 2: Indicators of financial inclusion, financial stability and economic growth

Sr. No.	Variable	Indicator	Similar Studies	Expected Outcome/ Sign	Source
1	**Financial Inclusion Index**				
	FI	Financial Inclusion Index (Composite index of six individual indicators)	Naceur, Barajas and Massara, (2015); Sharma (2016); Makina and Wale (2019); Jungo et al. (2022)	+/-	WDI/ FAS
2	**Financial Stability**				

Sr. No.	Variable	Indicator	Similar Studies	Expected Outcome/ Sign	Source
	Z-Score	Bank Z-Score (ROA+(Equity/Asset)/ σ(ROA))	Diaconu and Oanea (2014); Morgan and Pontines (2014); Rajhi and Hassairi (2013)	+	WB (FS)
3	**Economic Growth**				
	GDPPc	GDP per capita	Naceur, Barajas and Massara (2015); Evans and Adeoye (2016); Makina and Wale, (2019)	+	WDI
4	**Other Control/Explanatory Variables**				
	Liquidity	Liquid assets to deposits	Han and Melecky (2013); Siddik and Kabiraj, 2018	+/-	WB (FS)
	SFS	Broad money (M2) to GDP	Makina and Wale (2019); Naceur, *at el.*, (2015); Evans and Adeoye (2016); King and Levine (1993); Gelb (1996)	+/-	WDI
	RIR	Real interest rate	Akbas (2015); Sango and Moussa (2017); Evans and Adeoye (2016);	+/-	WDI
	LIT	Literacy rate	Čihák, Demirgüç-Kunt, Feyen and Levine, (2012); Naceur, *at el.*, (2015); Evans and Adeoye (2016);	+	WDI
	MU	Mobile phone subscriptions per 100 populations	Evans and Adeoye (2016); Kim, Yub, and Hassan (2018); Gebregziabher and Makina, (2019)	+	WDI

Sr. No.	Variable	Indicator	Similar Studies	Expected Outcome/ Sign	Source
	IU	Internet subscriptions per 100 populations	Datta and Aggarwal (2004); Evans and Adeoye (2016); Kim, Yub, and Hassan (2018);	+	WDI
	GEXP	Government expenditure to GDP	Čihák, Demirgüç-Kunt, Feyen and Levine, (2012); Naceur, *at el.*, (2015); Makina and Wale (2019)	+/-	WDI
	INF	Consumer price index	Čihák, Demirgüç-Kunt, Feyen and Levine (2012); Naceur, *at el.*, (2015); Evans and Adeoye (2016);	-	WDI
	IQI	Institutional quality index (Composite index of the six world governance indicators)	Kim, Yub, and Hassan (2018); Nurbekyan and Hovanessian, (2018)	+/-	WGI
	DIR	Deposit interest rate	Anoruo and Ahmad (2001); Mphuka, (2010); Evans and Adeoye (2016)	+/-	IFS
	BCBD	Bank credit to bank deposit	Allen et al. (2016); Siddik and Kabiraj (2018); Shihadeh and Liu (2019); Peter Eze and Markjackson (2020)	+/-	WB (FS)
	BCI	Bank cost to income	Umar and Akhtar (2021); Ozili, (2021);	-	WB (FS)
	NIM	Net interest margin	Ditta and Saputra (2020); Kaya (2022)	+/-	WB (FS)

Sr. No.	Variable	Indicator	Similar Studies	Expected Outcome/ Sign	Source
	GINI	Gini coefficient	Yorulmaz (2016); Park and Mercado (2018); Abdulkarim and Ali (2019); Omar and Inaba (2020)	-	WDI
	GFC	Global financial crises (Dummy variable, 1 for 2007 and 2008, and 0 for the remaining years)	Siddik and Kabiraj (2018); Han and Meleky (2013)	-	-

Note: FAS – Financial Access Survey; IFS – International Financial Statistics; WDI – World Development Indicator; WB (FS) – World Bank Financial Structure.

In order to achieve the objectives of the study and address the research questions, this study used the variables listed in the table above. Selection of the variables is undertaken based on the theories and their application in the prior empirical studies as indicated in the table above. Each of the variables indicated in table 1 above is further elaborated to create a common understanding and simplify the empirical analysis. In this research, there are three main dependent variables, namely financial inclusion (FI, a composite index constructed from the six individual financial inclusion indicators using PCA), financial stability (Z-Score) and economic growth (GDPPc).

4.3.1 Financial Inclusion Variables

Financial Inclusion (FI) is a broad and multidimensional concept that cannot be accurately captured by a single indicator (Camara and Tuesta, 2014; Sharma, 2016; Al-Smadi, 2018). Despite this fact, several earlier literatures used individual FI indicators such as the number of depositor accounts per 1000 population, the number of bank branches per 100,000 population, the number of ATMs per 100,000 population, the number of branches per 1000 Km^2, the number of ATMs per 1000 Km^2, private domestic credit to GDP, and others as a proxy indicators (Naceur *at el.*, 2015; Oji, 2015; Evans and Adeoye, 2016; Gebregziabher and Daniel, 2019). However, the use of individual

indicators only gives a partial information and might lead to a misleading conclusion on the level of inclusiveness. In addition, applying a multiple of related indicators of financial inclusion into a single equation may result in a problem of multicollinearity, and hence majority of recent literatures are promoting the need to construct a composite index (Sharma, 2016; Pinna, 2018; Ahamed and Mallick, 2019).

Consistent to the recent literatures above, which give a more comprehensive picture on the financial inclusion and avoid the common problems stemming from the use of individual indicators, this study selected six indicators from the three dimensions of financial inclusion and used to develop a composite index for financial inclusion. The indicators used to develop the composite index include: the number of bank account per 1,000 populations, indicating the level of penetration (accessibility), the number of bank branches per 100,000 populations, the number of ATMs per 100,000 population, the number of bank branches per 1,000 Km^2, and the number of automated teller machines (ATMs) per 1,000 km^2, indicating the level of financial service availability, and the volume of private domestic credit to GDP, indicating the level of financial services usage. While developing the composite index, this study applied a principal component analysis (PCA) technique, which will be explained in the later section (Chapter 5).

4.3.2 Financial Stability Variables

Financial stability indicators provide users a rough idea with regard to the soundness of a financial sector as a whole. While examining the stability of a financial system, financial soundness indicators, stress testing and financial sector development have been used in the different literatures (Han and Melecky 2013; Morgan and Pontines, 2014; Sahay *et al.,* 2015; Tosunoglu, 2018). The bank Z-score, stock market volatility, ratio of non-performing loans (NPLs), bank credit to bank deposits, capital adequacy ratio, and bank liquid assets to deposits and short-term funding are the variables commonly used to measure financial stability. In some cases, given the multi-dimensional nature of financial stability, scholars tried to construct and use composite index for financial stability (Nasreen and Anwar, 2018; Eweke, 2019). However, cross-country data for most of these variables is scarce, and hence this research used the banks Z-score as proxy indicator of financial stability. In essence, the bank Z-score compares bank capitalisation and returns against the volatility of returns. It is inversely related to solvency, and the higher the bank z-score is, the lower

the risk of bankruptcy. Bank Z-score is a popular indicator of the probability of default of the countries' banking system (Diaconu and Oanea, 2014; Siddik *et al.,* 2018; Shabir, *et al.,* 2021). Higher Z-score designates a lower probability that the banking system of a country become unstable. Z-score can be used to compare the level of default risk among different institutions with different goals and ownership structure.

4.3.3 Economic Growth

Scholars commonly use either GDP growth or GDP per capita as a proxy to economic growth. In most of the researches that examined the relationship between financial inclusion and economic growth, and financial stability and economic growth, GDP per capital (GDPPc) was used as a common proxy indicator. GDP per capita is used to assess the relationship between financial inclusion and economic growth in different studies (Makina and Wale, 2019; Balele, 2019; Shabir, *et al.,* 2021). In the same manner, GDP per capita is used to examine the relationship between financial stability and economic growth in other studies (Morgan and Pontines, 2014; Ho and Iyke, 2017; Tosunoglu, 2018; Nasreen and Anwar, 2018 and Barra and Zotti, 2020). Consistent to the above studies, this research applied the GDP per capita (GDPPc) as a proxy indicator for economic growth for the selected SSA countries.

4.3.4 Other Explanatory and Control Variables

Other explanatory and control variables are used to examine and identify the impact of the external factors on the relationship between FI, FS (ZScore) and EG (GDPPc), and augment the explanatory power of the descriptive variables. Use of these variables in the econometric estimation model is helpful to validate the characteristics of the dependent variables (Wooldridge, 2012). Control variables help to ensure the completeness of an econometric model and to deduce the logical relationship between the intended variables. Control variables are not variables of the research interest in the econometric estimation, but augment the explanatory power of the independent variables in the econometric model (Wooldridge, 2012). Control variables are auxiliary variables linked to economic, social and institutional factors that do not have correlation with the main variables. In the absence of these variables, most econometric model becomes incomplete and weak to give the required information. Control variables are expected to be selected in a way that protects the model from the effect of autocorrelation. Various control variables are identified to

examine the relationship between financial inclusion (FI) and financial stability (ZScore) and economic growth (GDPPc).

Macroeconomic and financial sector variables are the most commonly used explanatory variables incorporated in the estimation model. Inflation rate (INF), which is measured by the consumer price index, is critical to examine the level of economic stability (Evans and Adeoye, 2016; Ajide, 2017). Liquidity position (LP), measured by a liquid asset to deposits ratio is important to reduce vulnerability. Financial institutions with greater liquidity are less vulnerable to default and better financial stability (Han and Melecky, 2013; Siddik and Kabiraj, 2018). Size of the financial sector (SFS), which is the ratio of broad money supply (M2) to GDP, indicates the level of financial access (Demirguc-Kunt et al., 2012; Evans and Adeoye, 2016; Naceur et al., 2015), Inequality (GINI), which is income inequality (Yorulmaz, 2016; Abdulkarim1and Ali, 2019; Omar and Inaba, 2020), Deposit interest rate (DIR), indicate the nominal saving rate (Evans and Adeoye, 2016; Peter Eze and Markjackson, 2020), Real interest rate (RIR) (Akbas, 2015; Evans and Adeoye, 2016; Ajide, 2017; Fan, et al., 2018; Makina and Wale, 2019), Literacy (LIT) indicates the adult awareness level of financial services and is proxied by the literacy rate (Naceur *et al.,* 2015; Evans and Adeoye, 2016; and Demirguc-Kunt *et al.*, 2012).

Other control variables are technology infrastructure, which help lower transaction costs and facilitate information transmission and thus important to expand financial services. In this study, the number of mobile phone subscriptions (MU) and internet subscriptions (IU) per 100 populations are employed as a proxy for technology infrastructure (MU) (Evans and Adeoye, 2016; Kim, Yub, and Hassan, 2018; and Makina and Gebregziabher, 2019). Expenditure (GEXP) is the government's final consumption expenditure as a share to GDP (Demirguc-Kunt *et al.*, 2012; Evans and Adeoye, 2016; Makina and Wale, 2019). Bank credit to bank deposit (BCBD) (Siddik and Kabiraj, 2018, and Peter Eze and Markjackson, 2020), Global financial crises (GFC), dummy variable for 2007 and 2008 (Siddik and Kabiraj, 2018), bank cost to income (BCI), which is an efficiency measure, and net interest margin (NIM), which is a profitability measures of financial institutions (Ditta and Saputra, 2020; Kaya, 2022).

Moreover, there are several scholars that use the six governance indicators of the World Bank, which include government effectiveness (GE), regulatory quality (RQ), the rule of law (RL),

control of corruption (CC), voice and accountability (VA) and political stability and absence of violence (PSAV) to develop a composite index for institutional quality and support their studies to give a comprehensive picture and avoid the problem of partial information (Kim, Yub, and Hassan, 2018 and Sobiech, 2019). Consistent to the above literatures, this study developed a composite index for the Institutional quality (IQ) from the six world governance indicators using a principal component analysis (PCA) as it will be explained in the later section (Chapter 5).

4.4 Econometric Model Specification

In order to assess the determinants of financial inclusion (FI) and financial stability (FS), and examine the relationship that exists between financial inclusion (FI), financial stability (FS) and economic growth (EG), this study applied econometric models. Econometric regression is used to quantitatively identify the factors that affect financial inclusion and financial stability and identify the relationships between the three variables of interest (FI, FS and EG). In this regard, subject to the theories and similar empirical studies, this study applied the various dynamic panel data analysis techniques, including panel stationarity and cointegration tests and cause-effect relationship analyses. These techniques are common in the earlier studies of similar orientation (Tosunoglu, 2018; Eweke, 2019; Samuel and Abebe, 2015 and Nasreen and Anwar, 2018), but with different datasets that are drawn from different markets and countries.

Evans and Adeoye (2016) used a dynamic panel regression to assess and identify the key drivers of financial inclusion in fifteen African countries using data for the period of 2005 to 2014. Historical data were collated from the World Development Indicators. In this study, the number of depositors with commercial banks per 1,000 adults is used as the dependent variable, while GDP per capita, financial deepening (M2/GDP), credit to the real sector to GDP, inflation, number of people with internet access, internet servers, adult literacy rate, population, savings rate and a dummy for an Islamic banking are included as explanatory variables in the estimation model. Gebregziabher and Makina (2019) collected panel data for the period between 2004 and 2013 from the World Development Indicators and the International Monetary Fund - Financial Access Survey to assess the macroeconomic determinants of financial inclusion in twenty-seven African nations. Financial inclusion is defined as dependent variable while GDP per capita, domestic credit to the

public sector, mobile phone data subscription and the ratio of rural population identified as independent variables. The study used a dynamic panel GMM model to estimate the relationship.

The relationship between financial inclusion and financial stability was examined in different studies in two-ways. Some analyzed the impact of financial inclusion on financial instability (Rajan, 2005; Siddik *et al.*, 2018; Al-Smadi *et al.*, 2018), while others examined the influence of financial stability on financial inclusion (Kpodar, 2006; Eggoh, 2010). Causes of financial instability are both exogenous and endogenous, and hence most researches used a dynamic panel model to verify the direction of relationship between financial stability and financial inclusion. Sahay *et al.*, (2015) examined the relationship between financial inclusion and financial stability using a cross-country data with a panel regression approach. In this study, the overall effect of financial development, which combines a multidimensional measure including depth, access, and efficiency, are assessed against financial stability and economic growth of 200 observations. Result of the study showed that access to financial resources without proper supervision may lead to financial instability. On the other hand, countries with strong financial sector supervision and large access to credit results in financial stability and profit.

Siddik *et al.*, (2018) assessed the relationship between financial inclusion (FI) and financial stability (FS) based on a cross country panel data for the period of 2001 to 2013. In this study, two proxies were used for financial inclusion (FI): number of SMEs borrowers to total borrowers, and ratio of outstanding SMEs loans to total loans. Bank Z-score was also used as a proxy to financial stability (FS). Results of the study show a significant and positive relationship between FI and FS. Abdulkarim and Ali, (2019) examined the relationship between financial inclusion, financial stability, and income inequality in selected Organization of the Islamic Cooperation (OIC) countries. Data were analysed using the dynamic GMM panel estimation and quantile regression for 47 countries that are members of the Organisation of the Islamic Cooperation (OIC) for the period of 2006 to 2016. The results of the dynamic GMM estimation indicated that financial inclusion has a significant positive effect on both financial stability and income inequality.

In most of the literatures, the relationship between financial inclusion and economic growth was examined in three ways. Some studies examined the effect of financial inclusion on economic

growth (McKinnon, 1973; King and Levine, 1993; Beck and Levine, 2005; Eggoh, 2010), while others assessed the impact of economic growth on financial inclusion (Patrick, 1966; Boyd and Smith, 1996; Greenwood and Smith, 1997). Still others examined the interaction between financial inclusion and economic growth (Luintel and Khan, 1999; Levine *et al.*, 2000). In addition, financial stability is considered as one of the variables that influence economic growth, and economic growth is also identified as one of the variables that impacts financial stability (Kpodar, 2006). On the basis of the theoretical underpinnings, the relationships between the financial inclusions (FI), financial stability (FS) and economic growth (EG) are examined to identify the direction of causality between these three variables.

Makina and Wale (2019) evaluated the nexus between financial inclusion and economic growth using a panel data of forty-two African countries. The data were collated from the World Development Indicators for the period of 2004 to 2014, and the estimation was done using the panel GMM approach. Real GDP per capita was used as a dependent variable, while the ratio of credit to the real sector to GDP, number of branches per 1000 individuals, ratio of government consumption to GDP, ratio of primary school enrolment and the ratio of total trade to gross domestic product were used as explanatory variables. The study found that inclusive finance is critical to stimulate economic growth in Africa. Lenka and Sharma (2017), in the Indian context, examined the relationship between financial inclusion and economic growth using an annual time-series data for the period of 1980 to 2014. Economic growth was measured by real GDP per capita. In the research above, the authors applied a Principal Component Analysis (PCA) to construct a comprehensive index of FI, which comprises six single indicators of FI.

Sharma (2016) assessed the nexus between financial inclusion and economic growth in India for the period between 2004 and 2013. The author used a composite index of the three dimensions of financial inclusion, banking service penetration, availability of banking services and use of banking services. The Granger Causality analysis of the author shows that there is a bi-directional causality between outreach and economic development while a unidirectional causality exists running from deposits/loan accounts to GDP. Kim *et al.*, (2018) examined the relationship between financial inclusion and economic growth for countries under the Organization of Islamic Cooperation (OIC). The author used automated teller machines per 100,000 adults, bank branches

per 100,000 adults, deposit accounts with commercial banks per 1000 adults, borrowers from commercial banks per 1000 adults, and life insurance premium volume to GDP as explanatories of a financial inclusion. Results of the dynamic panel estimations showed that there are mutual causalities and concluded that financial inclusion is critical to promote economic growth. In line with the above researches, it is possible to observe that the studies used supply-leading hypothesis to build the endogenous growth model. In this hypothesis, financial inclusion promotes economic growth (Makina and Wale, 2019; Hanif and Arshed, 2016; Levine *et al.*, 2000).

4.5 Econometric Estimation

In order to address the research questions, this study applied relevant econometric techniques so as to draw valid inferences. In line with the nature of the data, which is both time series and cross-sectional, the research employed an approach that is based on a panel data analysis. A panel data analysis is a pooled cross-sectional and time-series data analysis technique. Pooled data contains both cross-sectional and time series dimensions, where all the cross-section units are observed during the whole time period. It relates subjects such as individuals, firms or countries over a period of time, which considers the possibility of heterogeneity in the series (Baltagi, 2008). Panel data help to better understand the dynamics of adjustment between observations (Baltagi, 2005).

Dynamic panel data introduce dynamic effects into the usual panel data model, and captures the dynamic effects of the current or past shocks (Hsiao, 1986). It also controls both missing and unobserved variables, allowing the identification of country-specific effects (Arellano-Bond, 1991). Dynamic panel specification also permits a high degree of cross-country heterogeneity as suggested by Demirgüç-Kunt and Levine (2009), who stated that results of cross-country studies become stronger and more informative with the use of dynamic panel estimates. The main criticism of a panel data is that it usually uses a lengthy time series without considering the effect of a cross-country dependence which often result in false inferences. In macro panels, not accounting for country-specific variables can cause model misspecifications (Baltagi, 2008).

In a multiple regression analysis like this, there is a possibility to encounter correlection between predictors, known as multicollinearity. Multicollinearity is a situation in which two or more explanatory variables have strong relations. It is well noted that multicollinearity is not a problem when the objective is to predict the dependent variable based on a set of independent variables.

However, multicollinearity becomes an issue when the need is to explain how the various independent variables impact the dependent variable. In quantitative studies, the presence of multicollinearity could lead to a large variance and covariance in the case where the model uses Ordinary Least Squares (OLS) estimations (Gujarati and Porter, 2009). Such an estimation bias will results in less precision and widens the confidence levels of the estimation criteria, and hence leads to an erroneous acceptance of the null hypothesis. Gujarati and Porter (2009) proposed the need to combining a cross-sectional and times series data to address the problem of multicollinearity. Other solutions include removing some of the highly correlated regressors, linearly combine the explanatory variables, such as adding them together, transforming variables by taking the first difference so as to smoothen the skewness in the series and avoid spurious correlation, or adding new data to increase the sample size. Performing an analysis on a highly correlated variables using the principal components analysis or the partial least squares regression is also proposed as a remedial action to address the issue.

On the basis of the above facts, this section presents the econometric models of this study in order to achieve the research objectives. In this study, there are three key dependent variables, namely FI, FS and EG. In order to analyse the relationship between the variables, there are various estimation approaches such as pooled ordinary least square (OLS), panel fixed effect model (FEM) and random effect model (REM). However, due to the nature of the dataset, which is relatively short time panel data, and the interest to incorporate the dynamic effect, the study applied the dynamic Generalised Method of Moments (GMM). Other reasons for the preference of the GMM estimator is that it helps to handle important modelling concerns such as the fixed effects and endogeneity of the regressors while avoiding a dynamic panel bias (Nickell, 1981). Consequently, the generic relationship between the variables is expressed using the dynamic Generalised Method of Moments (GMM) as stated below.

$$Y_{it} = \alpha Y_{it-1} + \beta X_{it} + \varepsilon_{it} \quad \text{..... (1)}$$

Where: $Y_{i,t}$ is the dependent variable into country i for time t; $Y_{i,t-1}$ is the lag of the dependent variable into country i for time t-1. α denotes a constant term. $Vector$ X, denotes all other variables that explain the dependent variable. ε_{it} is a random error term.

While estimating the equation, it is critical to differentiate between the difference and system GMM estimators, as both are designed for short, wide panels, and linear models with dynamic dependent variable, additional controls, and fixed effects (Bond, 2002; Roodman, 2009). The Difference GMM estimation is an estimation method that proceeds with first-differencing the data so as to eliminate the fixed effects, while the System GMM augments the Difference GMM by estimating simultaneously in differences and levels. Arellano and Bover (1995) argued that both estimators can use the forward orthogonal deviations transform instead of differencing.

It is also important to differentiate the Fixed Effects Model (FEM) over the Random Effect Model (REM). One of the crucial distinctions between the two is whether the unobserved individual effect represents elements that are correlated with the regressors (Green, 2008). Fixed Effect model assumes that something within the individual may bias the predictor or outcome variables and it is thus important to control this effect. On the other hand, the Random Effect model assumes that the variation across entities is random and uncorrelated with the independent variables, which are the predictors. In order to decide between the fixed or random affects, it is necessary to run a Hausman Test. It assumes that the null hypothesis of the preferred model is the random effects where the alternative is the fixed effects. It basically tests whether the unique errors (ui) are correlated with the regressors. The null hypothesis according to Green (2008) is that they are not correlated with the regressors.

4.5.1 Determinants of Financial Inclusion (FI) and Financial Stability (FS)

Determinants of financial inclusion and financial stability vary across countries due to a country and sector specific factors. Some of the common macro and micro factors that influence financial inclusion and financial stability include GDP per capita, inflation, literacy, population, internet, money supply, transaction costs, liquidity position, deposit interest rate, branch network, income, infrastructures, credit, interest rate, and structural, legal and institutional framework (Sarma and Pais, 2011, Demirgüç-Kunt, Klapper and Randall, 2014; Naceur *et al.*, 2015; Allen *et al.*, 2016; Sharma, 2016; Siddik *et al.*, 2018;). In order to identify the key determinants of financial inclusion and financial stability and address the first and second objectives of this study, the research employed equation two and three below. With the aid of the model specifications below, this study assessed the key drivers of FI and FS in the selected Sub-Saharan African countries. In the models

below, emphasis is given for the individual and time effects.

$$FI_{it} = \dot{\alpha} + \beta_1 FI_{i,t-1} + \beta_2 FS_{i,t} + \beta_3 EG_{i,t} + \beta_4 \sum_{n=1}^{i} X_{i,t} + \varepsilon_{i,t} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2)$$

$$FS_{it} = \dot{\alpha} + \beta_1 FS_{i,t-1} + \beta_2 FI_{i,t} + \beta_3 EG_{i,t} + \beta_4 \sum_{n=1}^{i} X_{i,t} + \varepsilon_{i,t} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3)$$

Where: FI_{it} and FS_{it} represent the dependent variables measuring financial inclusion (proxied by a composite index of six indicators, i.e. number of bank A/C per 1000 population, bank branches and number of ATMs per 100,000 people, number of branches and ATM per 1000 km^2 and private domestic credit to GDP) and Financial Stability (proxied by bank z-score) into country i for time t, respectively. Financial inclusion FI_{it-1} represents the lag of FI; financial stability $FS_{i,t-1}$ represents the lag of FS; X_{it} stands for control variables that have direct and indirect influence financial inclusion and ε_{it} is the error term. In addition, the subscript i refer to a country and t refers to a year.

Given the panel dataset, the use an Ordinary Least Squares (OLS) to estimate the relationship between the variables would be inappropriate as the lagged dependent variables are correlated with the error term, even if the disturbances are not autocorrelated. Such an estimation technique would certainly lead to biasness and endogeneity problems (Arellano and Bond, 1991). Hence, the endogeneity robust Generalised Method of Moments (GMM) is employed in the study. A Generalised Method of Moments (GMM) estimator addresses the stated problem using the first difference of the equations. Blundell and Bond (1998) indicated that a dynamic system-GMM provides a rigorous remedy for endogeneity bias in two ways. First, it is robust to a measurement error compared to cross-sectional regressions. Second, a dynamic GMM remains consistent even when the explanatory variables are endogenous. The maximum number of lags of the instrument sets is constrained in some specifications to avoid over-fitting.

A GMM estimation using a panel data has many advantages over the other estimations as it overcomes the shortcomings stemming from a cross-sectional estimation biases such as an omitted variable error, country-specific effects misspecification, endogeneity problems and the use of lagged dependent variables, which are common in a panel data regression (Blundell and Bond,

1998). Endogeneity bias is possible due to the interaction between financial inclusion, financial stability and economic growth. Such a bias is manifested in the form of autocorrelation, heteroscedasticity and omitted variable bias which can be solved by employing the system GMM-estimator (Blundell and Bond, 1998). A dynamic Generalised Method of Moment (GMM) panel estimator avoid spurious results and enhance robustness by assuming that the past explanatory variables are uncorrelated with the error term. In addition, the Hansen test is used to assess for over-identifying restrictions (Blundell and Bond 1998).

4.5.2 Principal Component Analysis (PCA)

Several earlier studies have been promoting the use of individual indicators for the multidimensional variables such as financial inclusion and institutional quality. However, the use of individual indicator only gives partial information and might lead to a misleading conclusion (Sarma, 2016; Siddik et al., 2016). In addition, applying a multiple related indicators into a single equation may result in a problem of multicollinearity. In order to address these problems, majority of the recent literatures are promoting the construction of a composite index. Kempson, Atkinson and Pilley (2006) set three important criteria to construct a good measure of financial inclusion, including (i) the ability to incorporate various dimensions, (ii) simple to calculate, and (iii) easiness for comparison. On the bases of the above suggestions, various attempts have been made to develop a universal financial inclusion and institutional quality indexes. However, no consensus has been reached on the standard measure to be adopted due to the various possibilities available to develop indices.

Literatures cited two common approaches to develop a composite index: non-parametric and parametric (Lockwood, 2004). The non-parametric methods assign weights to each indicator in the overall index exogenously, i.e. based on the researcher's intuition, which practically leads to indices to be sensitive to the weight assignment, and change in weights can alter the results. The parametric methods, on the other hand, determine the importance or weights of the indicators in the overall index endogenously through the covariance between the indicators on each dimension. Parametric approaches that are most commonly used for indexing include the principal component analysis (PCA) and Common Factor Analysis (CFA). PCA is preferable over Common Factor Analysis (CFA) of indexing because of the need to make assumptions on the raw data is made

unnecessary while selecting the underlying number of common factors (Steiger, 1979). On the basis of the above argument, the study applied a PCA to construct a composite index that serves as a proxy for financial inclusion (Sarma, 2016; Pinna, 2018; Ahamed and Mallick, 2019). Similar to the financial inclusion, the study developed a composite index for the institutional quality. In order to develop the two indices, this study applied a two stage approaches. First, the data collected for the various indicators is normalised using a min-max approach, which helps to smooth-out the variation within the data and make the trend appropriate for index development. On the basis of the above argument, the study applied the formula stated below.

$$F_{i,t} = \frac{P_{i,t} - Min_{i,t}}{Max_{i,t} - Min_{i,t}} \quad \ldots\ldots (4)$$

Where: $F_{i,t}$ - represents the normalized indicator i at time t, and $P_{i,t}$ individual financial inclusion indicator, $Max_{i,t}$ is the maximum and $Min_{i,t}$ is the Minimum values of each indicator, respectively.

Second, the normalised data generated for the variables is used to generate a single composite index. In this case, the study applied a principal component analysis (PCA) which calculates the Eigen values of the variance matrix for the specific indicators. In line with the above facts, the study employed the PCA specification below to construct the composite index for financial inclusion and institutional quality of the selected SSA economies.

$$FI_i = W_{i1}X_1 + W_{i2}X_2 + W_{i3}X_3 + \ldots + W_{in}X_n \quad \ldots\ldots (5)$$

$$IQI_i = W_{i1}P_1 + W_{i2}P_2 + W_{i3}P_3 + \ldots + W_{in}P_n \quad \ldots\ldots (6)$$

Where: FI_i = estimate of the i^{th} factor of financial inclusion; IQI_i = estimate of the i^{th} factor of governance indicators; W_i = weight on the factor of score coefficient; X_i = variable of interest; n = number of variables

4.5.3 Estimation Techniques: Relationships between FI, FS and EG in the SSA

A. Panel Unit Root and Serial Correlation Tests

Panel unit root test is undertaken to ascertain that the variables used in the model are stationary and prevent the possibility of spurious regression (Levin et al. 2002; Breitung and Pesaran 2005). In a panel unit root test, there are two generations of tests, known as the first and second generation tests. The first generation test assumes that the cross-section units are independent (Levin, Lin and Chu, 2002; Im, Pesaran and Shin, 2003; and Choi, 2001), while the second generation panel unit root tests relaxed this assumption and allows for a cross-sectional dependence (Chang, 2004; Moon and Perron, 2004; Choi, 2002; and Pesaran, 2003). Selection of the panel unit root tests can be based on the nature of a data set, balanced or unbalanced. On the basis of the assumptions used in the models, the Fisher type tests of ADF and Phillips Perron panel unit root tests are more appropriate for the unbalanced panel data set. However, if the data is balanced, these methods may give misleading results (Phillips Perron, 1988; Maddala and Wu, 1999; Choi, 2001).

In addition, the choice of which panel unit root test to apply is dependent on the size and power of the unit root tests (Granger and Porter, 2009). Size is the level of significance, while power indicates the probability of rejecting the null hypothesis when it is false. Use of a panel data allows solving the low power issues of unit root tests in small samples by increasing the number of observations (Baltagi and Kao, 2000). Wooldridge (2010) argue that it has a relatively low importance to conduct unit root test for a dynamic panel data with short time span and advise using fixed effect. On the other hand, a dynamic panel approach is effective irrespective of the nature of the regressors, exogenous or endogenous, or whether the variables are I(0) or I(1). However, it is necessary to ensure that none of the variables is second difference (Pesaran and Smith, 1995).

On the basis of the argument, both first and second generation tests are used to ascertain that none of the series are integrated in order two (I(2)). On the bases of the features of the dataset, both the first generation panel unit root tests (Levin, Lin and Chu (LLC), Im, Pesaran and Shin (IPS) and Breitung) and the second generation panel unit root test (CIPS, Pesaran (2007)) are used in the study. The Levin, Lin and Chu (LLC) panel unit root test allows that the error term is independently distributed across panels. It also assumes homogeneous first order autoregressive parameters (Levin, Lin and Chu, 2002). It is more powerful to deal with panel data than running individual unit root test for each cross section (Baltagi, 2008). The Im Pesaran and Shin (IPS) panel unit root test assumes the error terms to have a heterogeneous variance across panels. The IPS allows for

simultaneous stationary and non-stationary series tests (i.e. the slop can differ between individuals) and residual serial correlation and heterogeneity of the dynamics and error variances across groups (Pesaran and Shin, 2003). The Bruiting panel unit root test allows for time-specific effects and higher-order serial correlation so as to ascertain stationary at order I(0) and I(1). In addition, the CIPS test is made to allow cross dependency and verify that all the series are integrated in order I(0) and I(1), and no series is integrated at order I(2).

In line with the above panel unit root models, the null hypothesis of the panel unit root is that each variable has a unit root and the alternate hypothesis is that the series in the panel is stationary. In order to assess the panel unit root tests and identify the stationarity of the series, the study applied the model specified below.

$$\Delta Y_{it} = \alpha_i + \delta Y_{i,t-1} + \sum_{j=1}^{n} \rho_i \Delta Y_{i,t-q} + z_t^i \gamma + u_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (7)$$

Where Δ is the first difference operator is the series of observation for country i for t=1 …, n periods. The panel unit root test has the following null hypothesis H_0: $\delta_i = \delta = 0$ for all i, which presumes that all series are stationary.

B. Panel Cointegration Tests

Cointegration is a situation where two variables have a long-term relationship (Awe, 2012). In the case when all the series of the research prove stationary, then it requires a test for cointegration. Regression of a panel data assumes that the data is either stationary or cointegrated. Cointegration tests help to detect and avoid spurious regressions (Granger, 1986), and the existence of a cointegration is checked using various tests, which include the residual-based Dickey-Fuller and augmented Dickey-Fuller (Kao tests), residual-based LM, Pedroni, Westerlund and Likelihood-based (LR) tests of cointegrating rank in the case of heterogeneous panel models (Baltagi, 2008). However, all these tests are effective in cases where the underlying variables are integrated of order one [I (1)] (Pesaran, Shin and Smith, 2001). On the other hand, residual-based LM test is applicable for a panel data with homogenous nature across regions, and the test is based on the t-bar statistic.

In this study, due to the small sample size (20 years), a mixed order of integration across the series and slope homogeneity of the datasets, Autoregressive Distributed Lag (ARDL) panel test is used to verify the existence of cointegration (Pesaran, Shin and Smith, 1999). This method is based on the estimation of an error correction model (ECM), and unlike the other techniques, the ARDL/EC model is simple in its application and uses both the lagged and differenced variables to estimate the long and short run relationships. It applied when regressors are integrated in either I(0) or I(1). However, it is critical to ensure that none of the variables is integrated I(2) (Odhiambo, 2014). ARDL is a more preferable than the Engle-Granger technique as it does not push short-run dynamics into the residual term (Pattichis, 1999). ARDL cointegration test is helpful to check the relationship even when the explanatory variables are endogenous and simultaneously correct for the residual serial correlations (Ziramba, 2008).

The panel ARDL cointegration test generates the ECM equation for each dependent variable. The ECM equation provides information about the nature of causality and the speed at which the dependent variable returns back to an equilibrium after every shock through the estimated coefficient of the error correction term. It uses both the lagged and differenced variables to assess the existence of cointegration within the variables. Unlike the bound cointegration estimation model, this research is based on the dynamic panel data, and used the Mean Group (MG), Pooled Mean Group (PMG) and Dynamic fixed effect (DFE) estimators (Pesaran and Smith, 1995; Pesaran et al., 1999).

Mean Group (MG) estimator resolves the bias due to the heterogeneous slopes in the dynamic panels. It allows country-specificity in the short and long terms, i.e. it allows the coefficients to be heterogeneous in the long-run and short-run (Pesaran, Shin and Smith, 1995). Mean Group (MG) estimator estimates individual regressions for each country and compute the unweighted means. It provides a long-run estimate through averaging the long-run parameters for individual countries. On the other hand, the Pool Mean Group estimator (PMG) examines the possibility of heterogeneous and homogeneous dynamic relationship across countries. It assumes that the long-term slope parameters are homogeneous across countries, but the short-run coefficients are heterogeneous (Pesaran et al., 1999). The dynamic fixed effect estimator (DFE) is almost similar to PMG but it restricts not only the long-run coefficients but also the short-run coefficient to be

equal across countries. However, due to the size of the datasets, which is 20 years, this study did not opt for the Dynamic Fixed Effect (DFE) estimator.

Consistent to the above arguments, the relationships between FI, FS (ZScore) and EG (LnGDPPc) is estimated using the ARDL testing approach. Specifications of the panel ARDL cointegration tests are developed to examine the relationship between the three variables interchangeably as shown below.

$$\Delta FI_{i,t} = \Pi + \Theta_i[FI_{i,t-1} - \lambda_1 FS_{i,t-1} - \lambda_2 EG_{i,t-1}] + \sum_{j=1}^{p-1} \pi_{ij} \Delta FI_{i,t-j} + \sum_{j=0}^{q-1} \beta_{ik} \Delta FS_{i,t-k} + \sum_{i=0}^{n-1} \alpha_{il} \Delta EG_{i,t-l} + \emptyset_i + e_{it} \quad (8)$$

`

$$\Delta FS_{i,t} = \Pi + \Theta_i[FS_{i,t-1} - \lambda_1 FI_{i,t-1} - \lambda_2 EG_{i,t-1}] + \sum_{j=1}^{p-1} \pi_{ij} \Delta FS_{i,t-j} + \sum_{j=0}^{q-1} \beta_{ik} \Delta FI_{i,t-k} + \sum_{i=0}^{n-1} \beta_{il} \Delta EG_{i,t-l} + \emptyset_i + e_{it} \quad (9)$$

$$\Delta EG_{i,t} = \Pi + \Theta_i[EG_{i,t-1} - \lambda_1 FI_{i,t} - \lambda_2 FS_{i,t}] + \sum_{j=1}^{p-1} \pi_{ij} \Delta EG_{i,t-j} + \sum_{j=0}^{q-1} \beta_{ik} \Delta FI_{i,t-k} + \sum_{i=0}^{n-1} \beta_{il} \Delta FS_{i,t-l} + \emptyset_i + e_{it} \quad (10)$$

Where: Θ_i = - (1- α_i) group specific speed adjustment coefficient (expected that $\Theta_i < 0$); λ_2 = vector of the long run relationships, ECT – the error correction term, which is presented in the parenthesis [ ], π_{ij} β_{1j} and β_{2j} represents the short term dynamic coefficient, Δ Represents the first difference operator, EG_{it}, FI_{it} and FS_{it} are the respective dependent variables. EG (log of GDP per-capita); FI (composite indicator of six variables), and FS (ZScore), for country i at time t. e_{it} is a random error term.

4.5.4 Granger Causality Test between FI, FS and EG

Granger causality test helps to determine whether one time series is useful in forecasting another variable (Granger, 1969). Unlike the time series data where there is no effect of a cross section in the datasets, the panel data granger causality test requires a specific approach to examine the direction of causality between the variables. Granger causality assumes that the knowledge of the past values of one variable (X) help to improve the forecasts of another variable (Y) (Kar, Nazlıoğlu and Ağır, 2011). Hence, if a variable X (Granger) causes variable Y, then changes in X

should precede changes in Y. In regression of Y on other variables (including its own past values), including the lagged values of X significantly improves the prediction of Y and in that case, it is possible to conclude that X (Granger) causes Y. The same explanation applies if Y (Granger) causes X.

A significant number of causality tests depend on the traditional linear Granger causality tests (Rogalski, 1978; Jain and Joh, 1988, Antoniewicz, 1992), but the potential of such tests to uncover linear causal relations, their power against nonlinear causal relationships is low (Hiemstra and Jones, 1993). In such cases, the existence of a relationship does not prove causality or the direction of influence (Granger and Porter, 2009). Regression results may simply confirm the dependence of one variable on the others, without necessarily implying causation. One of the factors to be considered in the standard Granger causality tests is controlling for possible cross-sectional country dependence in the panel, as there is a high probability that economic shock in one country may affect the other due to the effect of globalisation and financial market integration (Kar *et al.*, 2011). In this case, it is important to address the problem of endogeneity in the basic panel estimation (Arellano and Bond, 1991).

Heterogeneity is the other problem to be considered in the estimated parameters for each country in the panel study. Existence of such problem while analysing the causality between variables of the study may result in spurious results due to the homogeneity assumption (Kar *et al.*, 2011). A Granger Causality test is often criticised for assuming stationarity, ignoring the time series properties of the variables included in the panel, which may lead to invalid and unreliable results (Zakaria, 2007). Hence, it is necessary to undertake the differentiation on the variables in order to convert the series to stationarity.

Other facts to note regarding the Granger Causality tests is the assumption that the error term in the causality tests were uncorrelated. However, if this was not the case, it is necessary to make an appropriate transformation. Granger causality is also sensitive to the number of lags included in the model. In order to address this problem, it is necessary to assess and determine the number of lags to be included in the model. It is possible to find a spurious causality due to a failure to account for important variables, and hence necessary to address such issues. A non-stationary data series

may lead to a spurious regression when no relationship actually exists in the data-generating process (McCallum, 2010).

In order to address the problems, various panel Granger Causality test approaches were used in different scenarios. Holtz-Eakin, Newey and Rosen (1988) are prominent for their GMM (VAR) approach of Granger Causality test and valid for homogeneous panels with small time series. Dumitrescu and Hurlin (2012) and Emirmahmutoglu and Kose (2011) developed two important panel granger causality tests that are suitable for heterogeneous panels with large time series. Recently, another new method was developed to address panel granger causality tests for models with either homogenous or heterogeneous coefficients (Juodis, Karavias, and Sarafidis, 2021). Due to the heterogeneous nature of the selected series, the GMM approach of Granger Causality test may not give proper output. It is, therefore, more appropriate to use the two models developed by Dumitrescu and Hurlin (2012) and Juodis, et al., (2021). Dumitrescu and Hurlin (2012) test, however, is more proper and powerful for datasets with relatively large time span. Consequently, Juodis, et al., (2021) test is more proper to test the Granger Causality between the three variables. However, the study applied all the two appropriate panel Granger Causality approaches to observe the output of the model and compare their results.

Once the results of the unit root and cointegration tests are validated, a pairwise Granger causality tests between the three variables (FI, FS and EG) were conducted. In this study, examination was made on the different types of causality, namely homogenous non-causality (HNC), heterogeneous non-causality and heterogeneous causality (Gujarati and Porter, 2009). In order to achieve the objectives, the study developed the standard model specification below to test the Granger Causality between the variables of interest, that are observed in time T years and N individual subjects.

$$Y_{i.t} = \alpha_i + \sum_{p=1}^{q} \gamma^p Y_{i,t-p} + \sum_{p=1}^{q} \beta_i^p X_{i,t} + \varepsilon_{i,t} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (11)$$

Where: X and Y are the two stationary variables, i is the country, p is the time lag, q is the number of lags and $t \in [I, T]$. The key assumption here is that there would exist a relationship between X and Y for at least one causal subset of the variables.

The advantage of using a panel data is that it increases the degree of freedom which improves the efficiency of Granger causality tests. However, failure to account for the existence of heterogeneity between individuals results in false inferences in the causality tests. Heterogeneity between individuals in a cross-sectional data requires permitting different intercept γk and slope $\beta_i{}^k$ estimates. Failure to recognise these differences during estimating a pooled regression will results in a biased estimation of individual intercepts and slopes, thereby leading to an incorrect causality conclusion (Kholdy and Sohrabian, 2005). Hence, the research introduced fixed effects into the above model to solve this problem. Heterogeneity in slope $\beta_i{}^k$ is a big problem and there is a possibility that causality exists only for one subset of heterogeneous individuals rather than the entire sample. In the event of heterogeneity being overlooked, the causality tests result become misleading. Hence, it is necessary to consider the different sources of heterogeneity in the data-generating process when testing for causality with panel data. In addition, on the basis of the econometric framework of Hurlin and Venet (2001), this study undertakes granger causality test to identify the direction of causality.

In line with the generic model of the Granger Causality test, specific models are developed to verify that there is a relationship for at least one subset of the three variables of interest, FI, FS, and EG. Specifically, the research adopted the models below for testing Granger Causality between the three variables, FI, FS and EG.

$$FI_{i.t} = \emptyset_i + \sum_{k=1}^{K} \partial_{i,k} FI_{i,t-k} + \sum_{k=1}^{K} \beta_{i,k} FS_{i,t-1} + \sum_{k=1}^{K} \beta_{i,k} EG_{i,t-1} + \varepsilon_{i,t} \quad \text{..... (12)}$$

$$FS_{i.t} = \emptyset_i + \sum_{k=1}^{K} \partial_{i,k} FS_{i,t-k} + \sum_{k=1}^{K} \beta_{i,k} FI_{i,t-1} + \sum_{k=1}^{K} \beta_{i,k} EG_{i,t-1} + \varepsilon_{i,t} \quad \text{..... (13)}$$

$$EG_{i.t} = \emptyset_i + \sum_{k=1}^{K} \partial_{i,k} EG_{i,t-k} + \sum_{k=1}^{K} \beta_{i,k} FI_{i,t-1} + \sum_{k=1}^{K} \beta_{i,k} FS_{i,t-1} + \varepsilon_{i,t} \quad \text{..... (14)}$$

Where: *FI and FS and EG* are the three stationary variables; *i* is the country; p is the time lag; k is the number of lags and $t \in [I, T]$; β and ∂ are coefficients; ε_{it} is the error term. The key assumption here is that there exists a relationship between *FI and FS and EG* for at least one causal subset of the variables.

4.6 Chapter Summary and Conclusion

In this chapter focus was given on the type and sources of the data, the sample size, the type of research approach, and the various methods that were applied to address the research objectives. In line with the nature and type of the data, which is short span and secondary panel data, the study adopted quantitative approach. In addition, composite indices were developed for multidimensional and plural indicators so as to address the limitations of using individual variables. Specifically, the study applied the principal component analysis technique to develop composite indices for the various individual indicators of financial inclusion and institutional quality and address the possibility of generating partial information and arriving at misleading conclusion. Efforts were also made to identify the various factors that affect financial inclusion and financial stability and discussed properly.

On the other hand, the study identified and adopted proper empirical models and applicable econometric estimation techniques that address the research questions. Consistent to the nature of the data series, the study identified relevant diagnostic tests, such as unit roots and ARDL cointegration rests, and applied in the analysis. In addition, the study adopted dynamic panel data estimation and analysis models to examine the major drivers of financial inclusion and financial stability in the selected Sub-Saharan Africa economies. Here, the study applied dynamic panel system GMM as a panel data estimator to identify the key drivers of financial inclusion and financial stability in the selected SSA economies.

In order to test and determine the degree of causality between financial inclusions, financial stability and economic growth, and determine the strengths of the casual relationship between the three key variables (financial inclusion (FI), financial stability (ZScore) and economic growth (GDPPc)), the study adopted panel mean group and pooled mean group estimators. In this case, the study employed the various types of panel non-Granger Causality tests to examine and identify the directive and direction of the causality between the three key variables of interest in the selected SSA countries.

In the next chapter, the study explores the development of the composite indices for financial inclusion and institutional quality, respectively.

CHAPTER FIVE: COMPOSITE INDEX DEVELOPMENT

5.1 Composite Indices – Financial Inclusion and Institutional Quality

Financial inclusion indicators give insight on the inclusiveness of a financial system. Several indicators have been used to assess the extent of inclusiveness of a financial system. These indicators are mainly classified into three dimensions, namely accessibility, availability and usage of financial services (Sarma, 2008; Sharma, 2016; Makina and Wale, 2019 and World Bank, 2017). However, the use of individual indicators has its own limitation and might lead to a misleading conclusion on the extent of financial inclusion (Sarma, 2012; Sharma, 2016; Siddik *et al.,* 2015). Consistent with the earlier empirical studies, which used the three financial inclusion dimensions together, this study selected six individual indicators from the three dimensions of a financial inclusion, based on the availability of data, and develop a composite index for the Sub-Saharan Africa countries using the principal component analysis (PCA). Similar to the financial inclusion index, several scholars have been constructing a composite index for an institutional quality from the six world governance indicators using PCA, as individual world governance indicators give incomplete information on the institutional quality of a country or a region (Ajide, 2017; Siddik *et al.*, 2018).

The six individual FI indicators that are used to construct the composite index for financial inclusion include: the number of depositor accounts per 1000 population, indicating access; the number of bank branches per 100,000 population, the number of ATMs per 100,000 population, the number of branches per 1000 Km^2, and the number of ATMs per 1000 Km^2, indicating availability; and private domestic credit to GDP, indicating usage of financial services. In addition, the six world governance indicators, namely government effectiveness (GE), regulatory quality (RQ), the rule of law (RL), control of corruption (CC), voice and accountability (VA) and political stability and absence of violence (PSAV) were used to construct an institutional quality index. This section, therefore, deals with the construction of the two composite indices and contributes for the achievement of the overall research objective.

5.2 Financial Inclusion Index

Financial Inclusion (FI) is a broad concept that cannot be accurately captured by a single indicator (Camara and Tuesta, 2014; Sharma, 2016; Al-Smadi, 2018). In order to address the weaknesses linked to the use of a single indicator, a large number of studies gave emphasis on the construction of an appropriate measure for financial inclusion. Camara and Tuesta (2014) used the three dimensions of financial inclusion indicators, namely access, usage and barrier, and a two stage principal component analysis (PCA) technique to construct a composite index for a financial inclusion. In the same study, four specific indicators were used to capture the access, including the number of bank branches over 100,000 population or 1,000 Km^2, and the number of automated teller machines (ATMs) over 100,000 population or 1,000 km^2, three indicators were used to capture the usage dimension, including financial product type, number of savings accounts; and amount of credit, and four indicators were used to capture the financial inclusion barriers, including distance, cost, documentation requirements and trust. In addition, while constructing the financial inclusion index, the authors applied a two-stage principal component analysis (PCA) (Camara and Tuesta, 2014).

Wang and Guan (2017) used access and usage dimensions to construct a financial inclusion index, in which case the two dimensions were weighted with the coefficient of variation (CV). In addition, the weight of each dimension was defined as the ratio of individual coefficient of variation to the total. Kim (2016), on the other hand, used three dimensions, namely penetration, availability, and usage, and assign equal weights to construct an index for a financial inclusion, while Mialou, Amidzic and Massara (2017) used a factor analysis to construct a composite financial inclusion index. Unlike non-parametric approaches, factor analysis addresses the possible criticisms that may arise from subjectivity linked to weighting of indicators and dimensions. Gupta *et al.,* (2012) used the average of the four important dimensions of financial inclusion, namely outreach, usage, ease and cost of transactions to develop a FI index and measure the level of FI in India. Sharma (2016) identified three dimensions of FI, namely accessibility (penetration), availability and usage of financial services to develop a financial inclusion index. Park and Mercado (2018) combined five financial inclusion indicators, namely number of ATMs, bank branches, borrowers, depositors and domestic credit to GDP ratio, to calculate the FI index using the idea of inverse Euclidean distance.

Sharma (2016), on the other hand, developed a composite FI index to evaluate the causality between FI and economic growth. In this research, the deposit accounts and deposit accounts with commercial banks per 1,000 population are taken as the main indicators of accessibility. On the other hand, branches and ATMs per 100,000 population were used as a measure of availability. Indicators of deposit and loan accounts per 1,000 populations were used to measure the level of usage. However, there are countries with a large share of population with bank accounts, but with a low level of financial service use. In order to address the problem, two services, namely outstanding deposits (% GDP) and outstanding loans (% GDP) of banks were used to measure the level of usage (Lenka and Bairwa, 2016, and Sarma, 2016).

Consistent to the above literatures, in order to construct a financial inclusion index for this study, the three financial inclusion dimensions and six indicators, namely access, measured by the number of deposit account at commercial banks per 1000 populations (DCB), availability (the number of commercial bank branches per 100,000 population (CBB), number of ATM per 100,000 population (NAT), number of bank branches per 1,000 Km^2, and the number of automated teller machines (ATMs) per 1,000 km^2) and usage (private domestic credit to GDP (PCG)) are used as inputs. The procedure involves that first all indicators were normalized using the min-max method, and then a principal component analysis (PCA) was applied taking the merit of low subjectivity over the other approaches. For the purpose of normalization, this study applied the equation stated below.

$$F_{i,t} = \frac{P_{i,t} - Min_{i,t}}{Max_{i,t} - Min_{i,t}} \quad \text{..... (15)}$$

Where: $F_{i,t}$ – is the normalized indicator i at time t, and $P_{i,t}$ individual financial inclusion indicator, $Max_{i,t}$ is the maximum and $Min_{i,t}$ is the Minimum values of each indicator, respectively.

Numerical values are calculated using the normalization procedure which falls in the range of 0 and 1, with values close to zero indicating a low level of inclusion, while those close to one representing a high level of inclusion. A Principal component analysis (PCA) is then applied on the normalized data to construct the index. On the basis of the results from PCA, the Eigen-values

of the financial inclusion are equal to the sum of the eigenvalues of the individual indicators. Individual variables that are included in the financial inclusion index are the number of deposit accounts at banks per 100,000 population, number of commercial bank branches per 100,000 population, number of ATM per 100,000 population, and private domestic credit to GDP.

Table 3: The Principal Components Analysis: Eigen values

Principal Component	Eigenvalue	Variance (%)	Cumulative (%)
1	4.477	74.60	74.60
2	1.015	16.90	91.50
3	0.276	4.60	96.10
4	0.135	2.20	98.40
5	0.083	1.40	99.80
6	0.014	0.20	100.00

Source: Author's own computations

The results of the analysis above shows that the first principal component explains the maximum variance (74.6%) with an eigenvalue of 4.48, followed by the second principal component, which explains the maximum proportion of the remaining variance (16.9%), with an eigenvalue of 1.02. However, the remaining four principal components constitute only 8.4% of the variance. Here, the rule of thumb to select the number of components is linked to the eigenvalue. Therefore, the components with eigenvalues above one and a variance greater than the average can be taken for the estimation. On the basis of the above analysis, it is possible to conclude that the first two principal components are more relevant financial inclusion measures for the sample of the SSA economies, which explain over 91% of the variance.

Table 4: Principal component analysis: Eigen vectors (loadings)

Variable	PC-1	PC-2	PC-3	PC-4	PC-5	PC-6
DCB	0.452	-0.021	-0.066	-0.619	-0.639	0.025
CBB	0.429	0.032	-0.682	0.557	-0.170	-0.102
NAT	0.383	0.528	-0.201	-0.360	0.627	0.105
PCG	0.367	0.504	0.637	0.400	-0.211	-0.015
NATMK	0.412	-0.456	0.232	-0.043	0.297	-0.692
NBK	0.400	-0.509	0.175	0.122	0.192	0.707

Source: Author's own computations

Table 3 above indicated that the first two principal components (PC-1 and PC-2) have strong effects on the overall financial inclusion of the SSA countries. The number of ATMs per 100,000 population (NAT) has a maximum weight in the PC-2, suggesting the strong influence of this variable on the second component. Private domestic credit to GDP (PCG) made a positive and significant contribution to the third principal component (PC-3). On the other hand, the number of commercial bank branches (CBB) has a positive and strong influence on PC-4, while the number of ATMs per 100,000 population (NAT) and number of bank branches per 1000 km^2 show the largest positive weight in the PC-5 and PC-6, respectively. Earlier scholars indicated that financial inclusion is a combination of the three dimensions, namely access, availability and usage. All of these dimensions are important in the construction of the index (Sharma, 2016; Kim, 2016; Pinna, 2018). On the basis of the results from the table 3 above, it is possible to observe that there are positive coefficients under the first principal component (PC-1) and a combination of positive and negative coefficients under the second component (PC-2), and this study used these components and constructed the level of financial inclusion in the selected SSA countries.

In line with the principal component analysis technique, an effort was made to construct a financial inclusion index for the selected SSA countries using the equation stated below.

$$\boldsymbol{FI} = (0.452*DCB + 0.429*CBB + 0.383*NAT + 0.367*PCG + 0.412*NATMK + 0.400*NBK) + ((-0.021*DCB) + 0.032*CBB + 0.528*NAT + 0.504*PCG + (-0.456*NATMK) + (-0.509*NBK)) \quad \ldots\ldots (16)$$

Where: FI – Financial inclusion index constructed using the first two components, DCB – is the

number of deposit account at commercial banks per 100,000 population (Access), CBB – is the number of commercial bank branches per 100,000 population (Access), NAT – is the number of ATM per 100,000 population (Access), PCG – Private domestic credit to GDP (usage), and NATMK – is the number of ATMs per 1000 Km^2 (Availability), NBK – is the number of commercial bank branches per 1000 Km^2 (Availability).

5.3 Institutional Quality Index

Consensus is lacking in the literature on the standard to follow while constructing an institutional quality index. Six governance indicators, namely government effectiveness (GE), regulatory quality (RQ), the rule of law (RL), control of corruption (CC), voice and accountability (VA) and political stability and absence of violence (PSAV) commonly represents the institutional quality of countries. Scholars use a mixture of individual indicator as well as a composite index while evaluating the level of institutional quality and evaluate the relationship between institutional quality and other relevant indicators (Kaufmann, Kraay and Mastruzzi, 2010). In order to address this problem, a composite institutional quality index is constructed so as to facilitate the empirical estimation efforts. While constructing a composite index for institutional quality, some researchers use an average of the six indicators and others use parametric approaches such as the principal component analysis (PCA) and factor analysis (FA) (Girma and Shortland, 2008; Law and Habibullah, 2009).

In this research, the institutional quality index was constructed from the six world governance indicators so as to determine its impact on the level of financial inclusion and financial stability in the sample SSA countries. Similar to the earlier empirical work of Nxumalo (2020), in constructing the institutional quality index, a principal component analysis (PCA) technique is adopted to avoid possible subjectivity linked to assigning weights. In addition, all the six world governance indicators, namely government effectiveness (GE), regulatory quality (RQ), the rule of law (RL), control of corruption (CC), voice and accountability (VA) and political stability and absence of violence (PSAV) are used as an input to construct the index.

The results of the analysis revealed that the eigenvalues of the correlation for the six world governance indicators that makeup the institutional quality is equal to the sum of the eigenvalues of the individual indicators. Individual variables that are included in the construction of the

institutional quality index were taken from the dataset of the world development indicator (WDI). Table 3 below indicates the eigenvalues of the principal component analysis.

Table 5: Principal components analysis: Eigen values

Component	Eigenvalue	Variance (%)	Cumulative (%)
1	5.014	0.836	0.836
2	0.478	0.080	0.915
3	0.250	0.042	0.957
4	0.138	0.023	0.980
5	0.064	0.011	0.991
6	0.055	0.009	1.000

Source: Author's own computations

It is possible to observe that the maximum variance (83.6%) was explained by the first principal component (Table 4), which has an eigenvalue of 5.01. The second principal component, on the other hand, provides the second maximum proportion of the variance (7.9%), with an eigenvalue of 0.48. The remaining four principal components account for 8.5% of the variance. The results of the analysis showed that the first principal component is more relevant to construct the institutional quality index for the sample SSA economies, which explain over 83.6% of the variance.

Table 6: Principal component analysis: Eigen vectors (loadings)

Variable	PC-1	PC-2	PC-3	PC-4	PC-5	PC-6
VA	0.400	-0.146	0.830	0.339	0.078	0.101
PSAV	0.344	0.920	0.001	-0.077	0.114	0.130
GE	0.425	-0.270	-0.214	-0.283	-0.169	0.769
RQ	0.424	-0.209	0.013	-0.608	0.477	-0.423
RL	0.435	-0.004	-0.082	-0.004	-0.782	-0.438
CC	0.414	-0.127	-0.509	0.656	0.337	-0.100

Table 5 above shows that the first principal component (PC-1) has positive coefficients, which represents its strong effect on the overall institutional quality of the SSA countries. VA has a maximum weight in the PC-3, suggesting the strong influence of this variable on the third

component. PSAV has a significant contribution in the second principal component (PC-2). On the other hand, GE has a positive and strong influence in PC-6, while CC shows the largest positive weight in PC-4. Hence, the institutional quality index is strongly linked to the effect of the first component, which plays a critical role in the construction of the index. From table 4 above, it is possible to observe that positive coefficients under the first principal component (PC-1) are the most influential variables to determine the level of institutional quality.

On the basis of the above results, it is possible to conclude that the first component is critical to construct the composite index as their eigenvalue and variance constitute the largest proportion of the components. In line with the principal component analysis technique, effort was made to construct an institutional quality index for the selected SSA countries using the equation below.

$$IQI = 0.400*VA + 0.344*PSAV + 0.425*GE + 0.424*RQ + 0.435*RL + 0.414*CC \ldots\ldots\ldots \quad (17)$$

Where: VA – Voice and accountability, PSAV – Political stability and absence of violence, GE – Government effectiveness, RQ – Regulatory quality, RL – Rule of law, and CC – Control of corruption.

In this case, comparison was made between the institutional quality indices constructed using a simple average of the six world governance indicators and the output of PCA. Result of the correlation matrix shows that the two indicators have strong correlation (99.95%), and hence the use of either index is possible in the study.

5.4 Chapter Summary and Conclusion

In this chapter, emphasis was given to develop the composite indices for financial inclusion and institutional quality. Financial Inclusion (FI) is a broad and multidimensional concept that cannot be easily and accurately captured by a single indicator. In order to address the weakness of using a single indicator, this study developed a composite index from six individual financial service indicators using a principal component analysis (PCA) approach. This index would, therefore, be used in carrying out the study. In the same manner, the study developed a composite index for institutional quality from the six world governance indicators, which is used to assess the effect of institutional quality on financial inclusion and financial stability.

In the next chapter, the study will present the major findings from the data analysis and discuss the results in detail.

CHAPTER SIX: DATA ANALYSIS AND DISCUSSION

6.1 Introduction

Literatures cited various macroeconomic and microeconomic factors as drivers of financial inclusion and financial stability. In addition, various types of relationships identified between financial inclusion, financial stability and economic growth, indicating no consensus across the available literatures. Consequently, efforts are still continued to identify the major determinants of financial inclusion and financial stability, and examine the causality between financial inclusion, financial stability and economic growth. This research is, therefore, one of the attempts that are made to address the gaps in the literature. In this section, results of the econometric analysis and empirical findings of the study are presented, and discussion is made on the major findings so as to address the research objectives. On the basis of the research objectives, this chapter attempted to address the following key research questions.

- What are the major drivers of financial inclusion in the Sub-Saharan African countries?
- What are the key drivers of financial stability in the Sub-Saharan African countries?
- In what way and to what extent are financial inclusion, financial stability and economic growth cointegrated in the long run in the selected Sub-Saharan African countries?
- What causal relationships exist between financial inclusion, financial stability, and economic growth in the selected Sub-Saharan African countries?

6.2 Data Analysis and Empirical Results

6.2.1 Data Characteristics and Composition

On the basis of the objectives of the study, the research used secondary data of twenty six Sub-Sahara African countries, which constitute about half of the economies in the region, that covered the period between 2000 and 2019. The sub-Saharan African countries that are included in the study are Angola, Botswana, Burundi, Cameroon, Chad, Democratic Republic of Congo, Equatorial Guinea, Ethiopia, Gabon, Ghana, Guinea, Kenya, Malawi, Mauritius, Mozambique, Namibia, Niger, Nigeria, Rwanda, Senegal, Sera Leone, South Africa, Tanzania, Togo, Uganda, and Zambia. The regional distribution of these countries shows that there are seven (7) countries from the East, seven (7) countries from the West, five (5) countries from Central and seven

countries (7) from the South regions of the Sub-Sahara Africa. In line with the income classification scheme of the World Bank and the IMF, the income categories of these countries are classified under the low income (12), middle lower income (8) and middle upper income (6) countries. In line with the economic development status of the region, majority of the sample countries fall under the low income categories.

Table 7: Regional distributions vs. income categories

Particulars		**Region**				**Total**
		East	**West**	**Central**	**South**	
Income Category	Low Income	5	4	2	1	**12**
	Middle Lower Income	2	3	1	2	**8**
	Middle Upper Income	-	-	2	4	**6**
Total		**7**	**7**	**5**	**7**	**26**

The summary of the econometric regression result above revealed that the countries used in the study vary in geographical location and income level, which are important to address the research objectives. In terms of the geographical location, a relatively large number of countries were taken from the three sub-regions, i.e. east, west and south. In addition, a relatively large number of countries were considered from the low income group. On the basis of the objectives of the study, it is not mandatory to ensure a proportional representation from the sub-regions. However, incorporating countries from different geographical locations and income groups is important to examine and observe the influence of financial inclusion on the financial stability and economic growth across the region. It also helps to get adequate insight and draw proper inference across the regions.

When we look at the sources of data, a large proportion of the data was taken from the World Bank Development Indicators. In addition, the databases of other international organisations, including the International Monetary Fund (IMF) and the United Nations (UNTCAD) were consulted to access relevant data for the study. Despite efforts to use comprehensive databases, there were missing observations for some of the variables used in the study. In this case, the study employed a moving average method to fill the missing values.

In line with the related literatures, the study evaluated and adopted various macroeconomic and microeconomic variables. Most of these variables were taken in their regular form. However, efforts were made to develop a composite index for financial inclusion and institutional quality. Individual variables such as the number of deposit accounts per 1,000 of the population, number of branches per 100,000 of the population, number of ATMs per 100,000 of the population, number of branches per 1000 Km^2, number of ATMs per 1000 Km^2, private domestic credit per GDP are used to develop a composite index for financial inclusion. In addition, the six World Bank governance indicators, such as political instability, control of corruption, are used to develop a composite index for institutional quality.

6.2.2 Financial Inclusion across Regions and Income Groups

Sub-Saharan Africa is still lagging behind the developing world in terms of financial inclusion, as only 43% of the adults hold an account in formal financial institutions, which is lower than the world average (69%) and the developing economies (63) (Demirguc-kunt and Klapper, 2017). In addition, statistical evidence below shows that the level of financial inclusion varies acorss the regions and countries of the SSA. Most of the countries have low level of financial inclusion. Specifically countries that are located in the east, west and central regions have a relatively low level of financial inclusion compared to the south region of the SSA. Financial inclusion across the majority of the nations in the stated regions is below the SSA average (43%) (Global Findex, 2017). However, some countries in the South, such as South Africa, have a relatively high level of inclusion compared to others, possibly due to the level of financial market development.

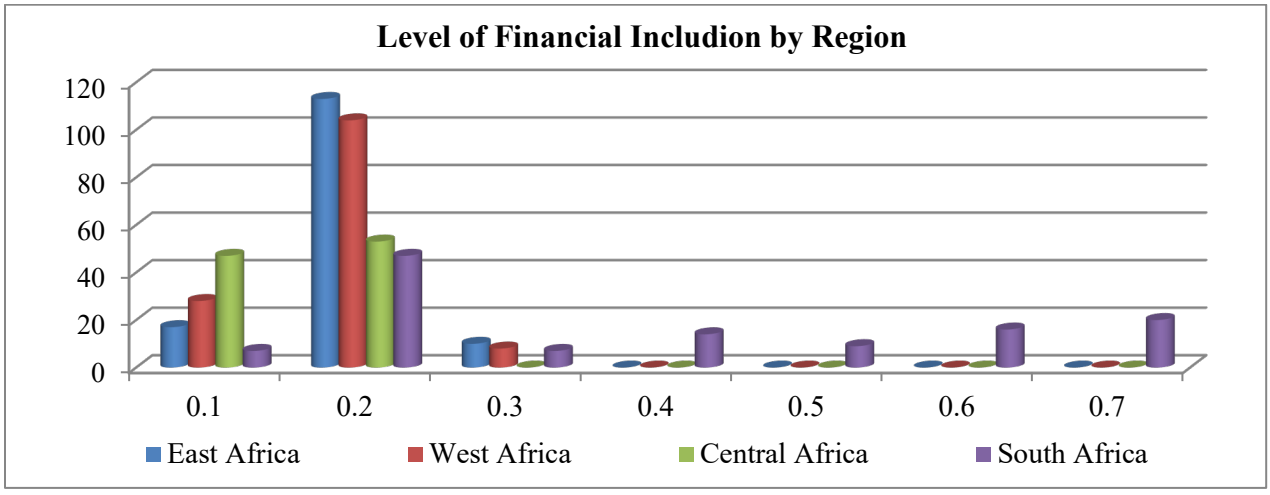

Figure 5: Level of financial inclusion across sub-regions

In terms of income categories, the statistical and descriptive analysis revealed that the uptake of financial services has variation across the region. Countries with relatively high income leading the rank of the financial inclusion index (FI), indicating investment in financial service infrastructure and economic development can be one reason for financial service access and availability and thereby financial inclusion. Majority of the low and middle lower income economies have a relatively low level of financial inclusion compared to countries that are in the middle upper income economies.

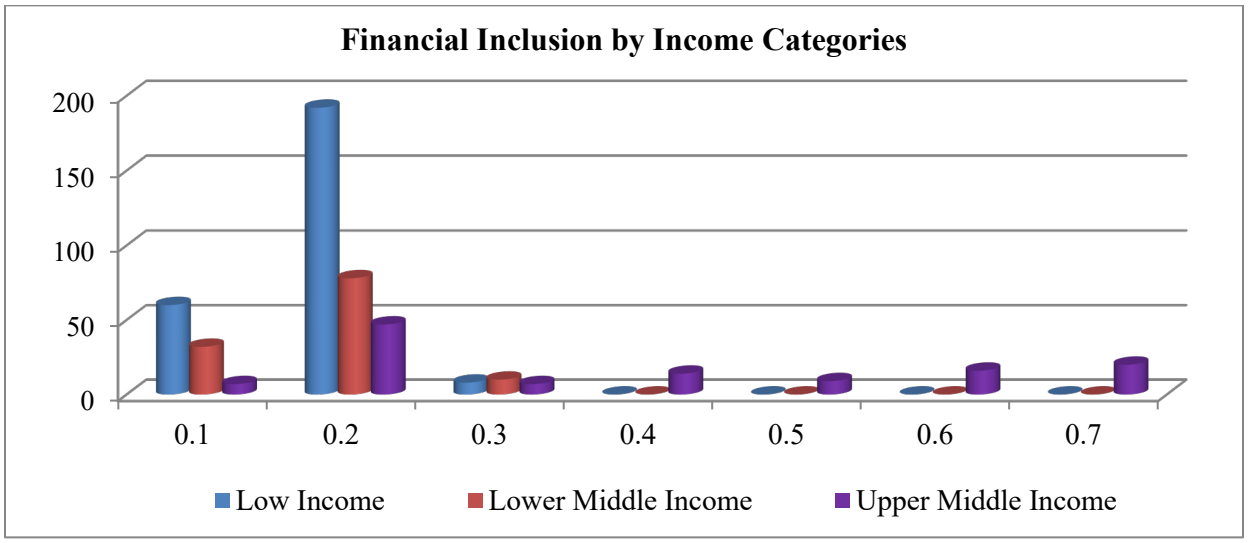

Figure 6: Financial inclusion across the various income categories

Some countries in the southern region with relatively high level of income has relatively better financial inclusion compared to others. Specifically, relatively high income countries such as South Africa, Namibia and Kenya have relatively high level of financial inclusion compared to others in the sample, indicating the need to consider the policies and strategies of the middle upper income countries so as to enhance the level of financial inclusion in the low income economies. Strategies of these economies may help to develop and implement context based strategies and policies that addresses the existing gaps and promote the socio-economic development of the countries.

6.2.3 Summary of the Descriptive Statistics

In line with the pertinent literatures, several variables are identified to address the specific objectives and answer the questions of the research. Some of these variables are macroeconomic, and others are microeconomic variables. The macroeconomic and microeconomic variables used in the study includes GDPPc (GDP per capita), INF (consumer price index), FI (financial inclusion index), which is a composite index for the six individual financial inclusion variables (DCB, CBB, NAT, NATMK, NBKM, and PCG), LIT (literacy rate), Income inequality (GINI), MU (ratio of mobile subscribers to total population), GEXP (government expenditure to GDP), and IQI (composite index of six governance indicators) SFS (broad money to GDP), ZScore (financial distress proxy for financial stability), LP (liquid assets to deposit), BCBD (Bank credit to bank deposits), PCG (Private domestic credit to GDP), RIR (Real interest rate), DIR (Deposit interest rate), NIM (Net interest margin), and BCI (Bank cost to income ratio). Summary of the statistical analysis for the major indicators used in the study are presented in table 7 below.

Table 8: Summary of the Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
FI	520	0.200	0.234	0.014	0.824
ZScore	520	11.137	6.014	2.204	47.341
LP	520	40.504	22.966	5.445	240.614
BCBD	520	73.827	23.859	13.754	137.331
GDPPc	520	2317.993	3403.413	111.927	22942.583
SFS	520	28.975	20.376	2.857	120.817
DIR	520	9.700	7.785	2.433	56.167
RIR	520	5.552	8.969	-60.781	38.976
NIM	520	7.337	3.593	0.000	39.210
LIT	520	63.789	20.102	14.376	95.023
GEXP	520	14.883	6.135	0.952	41.571
INF	520	10.63	32.302	-8.975	513.907
IU	520	9.833	13.295	0.006	68.200
MU	520	45.299	42.148	0.018	165.600
GINI	520	0.590	0.037	0.488	0.852
BDG	520	22.964	18.354	0.931	102.450
BPCG	520	18.772	19.023	0.328	101.230

Variable	Obs	Mean	Std. Dev.	Min	Max
BCI	520	57.628	13.474	21.026	103.685
IQI	520	-1.416	1.509	-4.680	2.132

Source: Author's own computations

Over the past two decades, financial inclusion has shown improvements in emerging markets and low-income countries (Findex, 2017). Unfortunately, unlike other developing regions, there is still poor performances in the level of financial inclusion indicators across the sub-Saharan Africa (SSA) countries due to economic, business, social, political and legal reasons (Norris *et al.*, 2015; Zins and Weill 2016; Asuming *et al.*, 2018). A summary of the statistical analysis above shows that there is a slight variation in the level of financial inclusion across the SSA countries as indicated by the standard deviations and variances of the various performance indicators.

One of the financial inclusion indicators, the number of depositor accounts with commercial banks per 1000 populations (DCB) shows a significant variation across the SSA countries. On average, there are 292 depositor accounts with commercial banks per 1,000 of the population. However, the standard deviation of this indicator is significant (460.6), indicating the existence of a significant variation across countries under the study. A relatively large number of depositor accounts is found in Mauritius (2,274) compared to the average (292). Other financial inclusion indicators such as the number of commercial bank branches per 100,000 of the population (CBB) and ATMs per 100,000 populations (NAT), the number of ATMs per 1000 Km^2 (NATMK) and number branches per 1000 Km^2 (NBK), and the value private domestic credit per GDP (PCG) only show slight variations. It is, therefore, possible to conclude that the access, availability and usage dimensions of financial inclusion have slight but not a significant difference across the selected SSA countries.

Sharma (2016) argues that individual indicators of the financial inclusion give only partial information and may lead to a misleading conclusion, and hence suggested the construction of a composite index. In line with this suggestion, a composite index was constructed using the above six common FI indicators to help as a proxy for financial inclusion (FI). Indicators used in the construction of a composite index were taken from the three dimensions of financial inclusion, i.e. access, availability and usage dimensions. Statistical analysis made on the composite index show

slight but not significant variation, as indicated by the mean (0.231) and standard error (0.146). On the basis of this indicator, the minimum level is observed in the Democratic Republic of Congo (0.02) while the maximum observation is in South Africa (0.82). On the basis of this indicator, it is possible to argue that the level of financial inclusion in the SSA countries is low, and hence it is important to analyse what this indicator signifies for the sustainable growth and development efforts of the region.

A financial inclusion index, which is a composite index of six variables, and financial stability, measured by financial distress (Z-Score), are the two critical variables for which this study sought to identify their determinants. A stable financial system raises the confidence level of the financial service users and improves the adoption level of financial service across corporate and individual users. The statistical analysis results show that financial stability, measured by financial distress (ZScore), varies between 2.2 and 47.34, with an average level of 11.14, indicating that the financial system of the SSA countries is a relatively stable with low variation in the financial stability across the selected countries.

Other financial stability indicators such as liquidity position (LP), bank credit to bank deposit (BCBD), bank cost to income (BCI) and profitability (NIM) show a slight but not a significant variation across the selected SSA countries. Maximum liquid asset to deposit and short term funding (241%) was observed in the Equatorial Guinea in 2012 while the minimum (5.44) was seen in South Africa in 2003. However, the average of this indicator was 40.5, indicating a slight variation across observations. On the other hand, the maximum bank credit to bank deposit ratio (137%) was observed in Namibia in 2005 and the minimum (14%) in Angola in 2000 with an average rate of 74%, indicating a relatively significant difference across observations. Similarly, bank cost to income ratio and net interest income has standard deviations of 13.5% and 3.6%, which show a slight but not a significant difference across observations.

Overall economic performances and the level of personal income of countries play an important role in the wellbeing of the population. One of the macroeconomic indicators, GDP per capita, which is a proxy of economic growth, shows quite a significant variation across observations. Its average and standard deviation of the observations are US $2,318 and US $3,403.4, respectively. The maximum per capita GDP observation is for Equatorial Guinea with US $22,942.6 in 2008

while the minimum is identified for Ethiopia with US $111.9 in 2002. On the other hand, income inequality these countries vary between 0.49 and 0.85, with an average rate of 0.59, indicating similarity in income inequality across the countries. Unlike GDPPc, variation in income inequality between these countries is still low, indicating that the living standard between these countries do not show much difference.

Inflation, measured by consumer price index, shows an average rate of 10.6% with the maximum and minimum rates of 513.9% and -8.98% for the Democratic Republic of Congo and Chad in 2000 and 2007, respectively. Real interest rate of the selected SSA countries is 5.55% on average, but it rises as high as 38.98%, and goes down as low as -60.78% for Angola in 2009 and 2000, respectively. In general, the level of trade openness is critical to enhance the performance of the economy. Level of trade openness across the sample countries vary between 20.7 and 152.5, with an average ratio of 66.8, indicating a slight variation in external business of the countries under study. In addition, the foreign direct investment (FDI) level of the sample countries vary between -6.4 and 64.4, with an average ratio of 4.1, which indicates a slight variation in the FDI flow across the sample SSA countries.

Simatupang, Sinaga and Harianto (2020) argue that government expenditure has an important effect on inclusive growth. It enhances the level of economic transactions and money circulations. Government transfer and spending in the form of redistribution through capital and recurrent expenditure leads to inclusiveness and improves the standard of life. However, it may promote competition and hurt the private sector investment when it is beyond a certain level (Simatupang *et al.,* 2020). Statistical analysis result of the study revealed that the proportion of government expenditure to GDP varies between the as low as 0.95 for Nigeria in 2003 and as high as 41.57 for Equatorial Guinea in 2015. The average government expenditure per GDP for the sample observations is 14.88, with a slight variation across observations.

Innovations in digital technologies and rapid subscription and utilisation rate are now forcing financial institutions to digitalize their financial services. With the innovation of digital financial services, the adoption of internet and mobile subscriptions become critical to raise the level of digital financial services. Analysis of the sample observations show that the proportion of mobile and internet subscriptions across the sample countries range between 0.02 and 165.6 and 0.01 and

68.2, respectively, and the average mobile subscriptions rate (41.42) is higher than that of the internet (9.09), indicating the high opportunity to expand mobile based financial services in the region. In addition, the data show the existence of a significant variation between the sample countries and thus appropriate to examine their implications.

Most developing economies exert maximum effort to increase the level financial services and thereby investment and economic growth so as to achieve a better living condition and prosperity (Sinha and Sinha, 1998). The level of financial services, measured by money supply to GDP, across the sample countries varies between -2.86 and 120.82, and the average gross domestic saving of these countries is 28.96, indicating the existence of a significant variation in the level of financial services across these countries. While expanding financial services, institutional quality and regulatory framework matters. Results of the statistical analysis show that the region is at the low level of institutional quality. Institutional quality, measured by the composite index of the six governance indicators, varies between -4.68 and 2.13, and the average is -1.42, indicating a slight variation across observations.

On the basis of the above descriptive statistical analysis, it is possible to observe that there is a slight variation across observations of the different indicators, including the level of financial inclusion, financial stability and other financial sector development indicators across countries, and hence the observations are helpful to give insight on the determinant of financial inclusion and financial stability in the sample countries and identify the impact of financial inclusion on financial stability and economic growth of the sample SSA countries.

6.2.4 Multicollinearity Test - Drivers of Financial Inclusion and Financial Stability

Multicollinearity is a situation where several explanatory variables that are used in the regression analysis have strong correlation not only with the dependent variable but also to each other (Shrestha, 2020). Correlation, on the other hand, refers to a situation where two or more variables move together. When variables have positive correlation, indicating that the variables move together (increase or decrease together). Negative correlation, on the other hand, indicates that the variables move in the opposite directions (Shrestha, 2020). Correlation is a bivariate linear relationship between variables while multicollinearity is a multivariate relationship, if not always. Correlation matrix is one of the good indicators for the existence of multicollinearity, and directs

researchers to undertake further investigation so as to address the problem.

One of the rules of thumbs to check for the existence of multicollinearity is, thus, to conduct correlation analysis. If the results of the correlation analysis are above 0.8, then it is necessary to suspect the possibility of multicollinearity in the regression model. It is also possible for individual regression coefficients to be insignificant while the overall fit of the equation to be high (Young, 2017). Multicollinearity leads some of the potentially significant variables under study to be statistically insignificant (Shrestha, 2020).

In order to check and address the problem of multicollinearity, the study conducted a correlection analysis and variance inflation factor analysis on the variables used in the two models that are developed to assess the determinants of financial inclusion and financial stability in the SSA countries.

A. Correlation Analysis – Financial Inclusion

Correlation analysis was made on the variables used to assess the determinants of financial inclusion. In this model, which is used to assess the key drivers of financial inclusion in the SSA countries, the correlection matrix result revealed that there is no variable with a correlation coefficient of above 0.8. This indicates that there is low or no potential effect of multicollinearity. Analysis results of the correlation matrix indicates that the maximum correlation coefficient is observed between the lag of financial inclusion and financial service accessibility, which is measured by the broad money supply to GDP, followed by the lag of financial inclusion and institutional quality index. Other variables have a low correlation index, indicating the variables are consistent to be used for the intended analysis. Table 8 below shows the correlation analysis result of the financial inclusion.

Table 9: Financial Inclusion (FI) Correlations Matrix

Variables	(L.FIN)	(ZScore)	(LnGDPPc)	(LnSFS)	(INF)	(GEXP)	(MU)	(LIT)	(IQI)	(BCI)	(NIM)	(BCBD)	(IUG)
L.FIN	1.000												
ZScore	0.267	1.000											
LnGDPPc	0.630	0.236	1.000										
LnSFS	0.720	0.237	0.381	1.000									
INF	-0.101	-0.081	-0.146	-0.189	1.000								
GEXP	0.444	0.192	0.360	0.490	-0.095	1.000							
MU	0.644	0.085	0.643	0.526	-0.161	0.268	1.000						
LIT	0.546	0.213	0.630	0.336	-0.025	0.305	0.427	1.000					
IQI	0.685	0.167	0.453	0.703	-0.151	0.364	0.482	0.439	1.000				
BCI	-0.171	-0.257	-0.249	-0.221	-0.019	-0.129	-0.018	-0.162	-0.196	1.000			
NIM	-0.381	-0.065	-0.455	-0.318	0.064	-0.277	-0.268	-0.174	-0.091	0.095	1.000		
BCBD	0.475	0.441	0.270	0.419	-0.274	0.191	0.286	0.196	0.331	-0.015	-0.289	1.000	
IUG	-0.178	-0.118	-0.202	-0.240	0.099	-0.124	-0.231	-0.112	-0.153	0.079	0.060	-0.140	1.000

On the basis of the above correlation analysis matrix, it is possible to conclude that there is no strong correlection between the proposed explanatory variables of financial inclusion, and hence the variables can be used for the intended regression analysis.

B. Correlation Analysis – Financial Stability

Various factors drive financial stability of a country. In addition, there is a possibility that an individual factor may correlate with another and affect the analysis. In the econometric model that is specified to assess the major determinants of financial stability, it possible to observe that there is no variable with a correlation coefficient of above 0.8 in the correlection matrix, indicating low possibility for the existence of multicollinearity.

On the basis of the correlation matrix, the maximum correlation coefficient is observed between institutional quality and financial inclusion index (0.69), which is a composite index of six indicators, followed by the correlation coefficient between the number mobile subscriptions and financial inclusion index (0.65). The correlation coefficient between the financial inclusion and economic growth is the third higher correlation (0.64) in the matrix. Other variables have a low correlation index, indicating the variables are consistent to be used for the intended analysis. Table 9 below shows the correlation analysis results of the financial stability.

Table 10: Financial Stability (ZScore) Correlations Matrix

Variables	**(**L.ZScore**)**	**(**FI**)**	**(**LnGDPPc**)**	**(**GINI**)**	**(**IQI**)**	**(**MU**)**	**(**DIR**)**	**(**LP**)**	**(**NIM**)**	**(**BCBD**)**	**(**RIR**)**	**(**GFC**)**
L.ZScore	1.000											
FI	0.265	1.000										
LnGDPPc	0.232	0.641	1.000									
GINI	0.209	0.507	0.358	1.000								
IQI	0.197	0.693	0.442	0.529	1.000							
MU	0.067	0.647	0.643	0.163	0.481	1.000						
DIR	0.054	-0.122	-0.350	0.000	-0.000	-0.230	1.000					
LP	-0.235	-0.355	-0.145	-0.120	-0.419	-0.381	0.163	1.000				
NIM	-0.042	-0.386	-0.455	-0.160	-0.088	-0.268	0.437	0.031	1.000			
BCBD	0.457	0.468	0.270	0.351	0.343	0.286	-0.227	-0.532	-0.289	1.000		
RIR	-0.012	-0.003	-0.177	0.058	0.036	-0.063	0.178	0.042	0.205	-0.044	1.000	
GFC	-0.069	-0.048	0.016	0.078	0.001	-0.137	-0.003	0.049	0.028	-0.042	-0.057	1.000

On the basis of the above correlation analysis matrix, it is possible to conclude that there is no strong correlection between the proposed explanatory variables of financial stability, and hence the variables can be used for the intended regression analysis.

C. Variance Inflation Factors – Financial Inclusion and Financial Stability

A variance inflation factor (VIF) analysis is another common technique used to measure the extent to which multicollinearity has increased the variance of an estimated coefficient. It evaluates the extent to which an explanatory variable can be explained by all the other explanatory variables in the equation. In order to test the possibility of multicollinearity and ensure the appropriateness of the model, the study conducted a variance inflation factor analysis on the variables used in the two models. Variance inflation factor (VIF) helps to ensure a formal detection and tolerance level of multicollinearity. In case when the value of VIF is equal to 1, it indicates no correlation exist between the independent variables. If the value of VIF is between 1 and 5, there is a moderate correlation between the variables used in the regression. If the VIF is between 5 and 10, there will be multicollinearity among the predictors in the regression model, and VIF above 10 indicates the regression coefficients are weakly estimated with the presence of multicollinearity (Belsley, 1991). Results of the variance inflation factors in the two models show that the average variance inflation is below five, which is far below the threshold and there are no variables with above 10 point variance inflation factor.

In case of the variables used to assess the drivers of financial inclusion, there is no variable with a vector inflation factor above five (5) (Table 10 below). While evaluating the covariance between variables used to assess the determinants of financial inclusion, the maximum variance inflation factor is 4.6, which is acceptable to use the variables. In this model, the average variance inflation factor is 2.42, which shows a low possibility for multicollinearity, suggesting that it is possible to proceed with the regression.

Table 11: Financial Inclusion (FI) Variance Inflation Factor

Variables	VIF	Tolerance (1/VIF)
L.FI	4.600	0.217
LnSFS	4.100	0.244
LnGDPPc	3.635	0.275
IQI	2.633	0.380
MU	2.404	0.416
LIT	1.902	0.526
BCBD	1.763	0.567
NIM	1.675	0.597
ZScore	1.457	0.686
GEXP	1.433	0.698
BCI	1.268	0.788
INF	1.164	0.859
IUG	1.113	0.899
Mean VIF	**2.242**	**-**

Source: Author's own computations

While evaluating the covariance between the variables used to assess the determinants of financial stability, there is no evidence that exhibited the existence of multicollinearity. Results of the variance inflation factor analysis show that there is no indicator with a variance inflation factor above five (Table 11). In this model, the average variance inflation factor for the variables is 2.035, which shows a low possibility for multicollinearity, and hence we can safely proceed with the regression and data analysis.

Table 12: Financial Stability (ZScore) Variance inflation factor

	VIF	Tolerance (1/VIF)
FI	3.726	0.268
LnGDPPc	2.906	0.344
MU	2.670	0.375
IQI	2.512	0.398
BCBD	2.144	0.467
LP	1.846	0.542
GINI	1.764	0.567
NIM	1.711	0.584
DIR	1.500	0.667
L.ZScore	1.474	0.679
RIR	1.105	0.905
GFC	1.064	0.940
Mean VIF	**2.035**	**.**

Source: Author's own computations

On the basis of the above correlation analysis matrix and variance inflation factor analysis, it is possible to conclude that the explanatory variables selected to assess their relationships with financial inclusion and financial stability did not suffer from multicollinearity, and hence the variables are appropriate and can be used for the intended econometric analysis.

6.2.5 Panel Unit Root and Serial Correlation Tests

Prior to running a regression model, testing for stationarity of the variables is a standard approach. Several studies carried out panel unit root test to examine the stationarity of data series (Al-Mmulali et al., 2013; Jungo et al., 2022). In line with similar empirical studies, panel unit root test is undertaken to verify that no variables integrated at order I(2). This is because, cointegration tests such as the ARDL method is only applicable for the variables that are integrated of order zero I(0) or one I(1) (Nyasha and Odhiambo, 2015). In essence, the dynamic panel approach, which is used in this research, is effective irrespective of whether the regressors are exogenous or endogenous, and irrespective of whether the variables are of order zero I(0) or one I(1) (Pesaran and Smith,

1995; Pesaran, Shin and Smith, 1999). However, it is necessary to examine and ensure that none of the variables is of order I(2).

In order to validate the order of integration, the study conducted both first and second generation panel unit root tests. Consistent with the features of the datasets, the study conducted three first generation panel unit root tests, namely the Levin, Lin and Chu (LLC), Im, Pesaran and Shin (IPS) and Breitung, and one second generation panel unit root test (Pesaran, 2007). On the basis of these tests, the null hypothesis (H0) is that all the panels contain a unit root and the alternative hypothesis (H1) is that there is no unit root and the panel is stationary. Consequently, the study specified the generic panel root test equation below.

$$\Delta Y_{i.t} = \rho_i Y_{i.t-1} + Z_{i,t}\gamma + U_{i.t} \quad \text{..... (18)}$$

Where: i = 1, 2... N is the individual, for each individual t = 1, 2...T, time series observations are available, Z_{it} is the deterministic component and U_{it} is a stationary process. Z_{it} could be zero, one, the fixed effects (μ_i), or fixed effect as well as a time trend (t).

Using the model stated above, panel unit root tests were conducted on the variables that are incorporated in the different models. On the basis of the result from the three first generation panel unit root tests, namely LLC, IPS and Breitung, and the second generation panel unit root test, the study proved the stationarity of the variables. The regression results of the panel unit root tests revealed mixed order integration. Table 12 below depicts the various panel unit root test results of the variables used in the study.

Table 13: Panel Unit Root Tests

Variables	Levin Lin Chu (LLC)		Im Pesaran Shin (IPS)		Breitung		Pesaran (2007) (CIPS)	
	Statistic	**Order**	**Statistic**	**Order**	**Statistic**	**Order**	**Statistic**	**Order**
FI	-1.370*	I(0)	-6.465***	I(1)	-5.123***	I(1)	-3.980***	I(1)
L.FI	-3.7161***	I(1)	-6.4904***	I(1)	-5.092***	I(1)	-3.825***	I(1)
ZScore	-3.8917***	I(0)	-5.4304***	I(0)	-3.094***	I(0)	-5.902***	I(0)
LP	-3.527***	I(0)	-2.973***	I(0)	-1.391*	I(0)	-2.908***	I(0)

Variables	Levin Lin Chu (LLC)		Im Pesaran Shin (IPS)		Breitung		Pesaran (2007) (CIPS)	
	Statistic	Order	Statistic	Order	Statistic	Order	Statistic	Order
BCBD	-5.483***	I(0)	-7.211***	I(1)	-2.089**	I(0)	-3.140***	I(1)
LnGDPPc	-7.260***	I(0)	-8.195***	I(1)	-5.772***	I(1)	-4.147***	I(0)
LnSFS	-3.051**	I(0)	-10.508***	I(1)	-4.807***	I(1)	-3.724***	I(0)
DIR	-4.343***	I(0)	-9.228***	I(1)	-4.836***	I(1)	-2.161***	I(0)
RIR	-7.118***	I(0)	-8..698***	I(0)	-3.625***	I(0)	-3.427***	I(0)
NIM	-6.690***	I(0)	-8.249***	I(0)	-1.775**	I(0)	-10.431***	I(0)
LIT	-6.459***	I(1)	-9.977***	I(1)	-8.752***	I(1)	-3.784***	I(1)
GEXP	-2.389***	I(0)	-10.845***	I(1)	-6.032***	I(1)	-1.972***	I(0)
INF	-39.133***	I(0)	-8.086***	I(0)	-1.998**	I(0)	-7.481**	I(0)
GINI	-7.7301***	I(0)	-2.676***	I(0)	-5.941*	I(0)	-3.095***	I(1)
MU	-2.044**	I(0)	-7.179***	I(1)	-6.767***	I(1)	-4.327***	I(0)
IQI	-2.787***	I(0)	-11.204***	I(1)	-5.663***	I(1)	-4.212***	I(1)
IUG	-7.130***	I(0)	-8.536***	I(0)	-4.541***	I(0)	-10.123***	I(0)
BCI	-4.294***	I(0)	-3.772***	I(0)	-2.032**	I(0)	-3.593***	I(0)

Source: Author's own computations

Note: *Robust standard errors in parenthesis (***), (**), (*) indicates the level of significance at 1%, 5% and 10%, respectively.*

Table 12 above provides the panel unit root test statistics of the series. The first column reflects the variables used in the panel unit root test, while the second, fourth, sixth and eighth columns indicate the statistics (individual effect and intercept) with their p-value (*), and the third, fifth, seventh and ninth columns show the order of integration under the various panel unit root tests. In all the stated models, the variables were examined for their level of integration, and the result of the examination revealed that the variables are statistically significant at 1%, 5% and 10%. In particular, financial inclusion index (FI), financial stability (ZScore) and economic growth (LnGDPPc) are statistically significant at one and ten percent.

In addition, the panel unit root test results revealed that the variables have a mixed order of integration. Some of the variables are integrated of level I(0) and others at order I(1), and hence the test results are not consistent within and across the various unit root tests. In particular, the

three critical variables of the study, namely Financial Inclusion (FI), which is a composite index of six indicators, Financial Stability (Z-Score), and Economic Growth (LnGDPPc) revealed a mixed order of integration. However, results of the tests show that none of the variables is integrated in order I(2). This shows that the variables are appropriate to undertake a cointegration test and valid for the dynamic panel data analysis. It is, thus, possible to safely begin the dynamic panel data estimation. Consequently, the variables are used in their order of integration. In addition, the variables used in the model can be applied irrespective of whether the variables are I(0) or I(1).

6.2.6 Determinants of Financial Inclusion and Financial Stability

In real world scenarios, economic and business relationships are dynamic and hence the use of a dynamic panel approach helps to better understand the dynamics in the system (Baltagi, 2005). In order to adequately capture the various drivers of financial inclusion and financial stability and address the dynamic processes, this study applied a dynamic panel estimation approach. Several macroeconomic and microeconomic factors drive financial inclusion and financial stability. In addition, derivers of financial inclusion and financial stability vary across nations and regions due to regional and country specific factors, and hence the use of a dynamic panel data model helps to introduce dynamic effects into the usual panel data model and easily identify their relationships (Baltagi, 1995). In this sense, the application of the dynamic panel specifications and the use GMM in this research help to address the high degree of cross-country heterogeneity. It also helps to capture the dynamic effects of the current and past shocks, control any unobserved and missing relationships, and identify country-specific effects (Hsiao, 1986; and Arellano-Bond, 1991).

In order to assess the determinants of the two important variables, the use of GMM has its own challenges. Literatures show two versions of the GMM estimators. One of these estimators is the difference GMM developed by Henderson and Hsiao (1981), and Arellano and Bond (1991). It suggests differencing the model and using the lagged values of the lagged dependence as the instrument to address both autocorrelation and endogeneity problems. Arellano and Bover (1995), and Blundell and Bond (1998), on the other hand, argue that differencing the model may cause problems on small sample and entails an omission variable bias and inconsistency in the result and advocated for a system GMM. One of the advantages of system GMM over Difference GMM is that it takes into account the values of lagged dependence and explanatory variables as instruments

to attain a robust and consistent result. On the basis of the above arguments, it is found necessary to decide between deference and system GMM, and adopt the appropriate estimator for the models.

A. Decision between Difference and System GMM

Various justifications are cited to use either the difference or system generalized method of moments (GMM) estimation. Some of these reasons include (i) the estimators is helpful to handle the problem of modelling linked to fixed effects and endogeneity of regressors while avoiding a dynamic panel bias; (ii) flexibility of the GMM framework to accommodate unbalanced panels and multiple endogenous variables; and (iii) GMM is easily manageable using free software (Nickel, 1981; Arellano and Bond, 1991; Arellano and Bover, 1995; Blundell and Bond, 1998; Arellano and Bond, 1998; Doornik, Arellano and Bond, 2002). However, the use of either a difference or system GMM estimation requires a proper evaluation of the two estimation approaches. In practice, difference GMM follows first differencing approach so as to eliminate the fixed effects. On the other hand, system GMM augments the difference GMM by estimating the model simultaneously in difference and level. It combines the moment conditions for the differenced equation with moment conditions for the model in level (Arellano and Bond, 1991).

In order to decide between the difference and system GMM, there are two approaches (rule of thumbs). Rule of thumb one states that the standard GMM estimator is known to be a consistent estimator as the size of the unit approaches infinity. However, the application of the difference GMM estimator yields both a biased and inefficient estimation for the lag dependent coefficient in finite sample (heteroscedasticity and serial correlation), and this is particularly acute when the time period is short. Such poor performance of the difference GMM estimator is attributed to the use of poor instruments and hence proposed the use System GMM (Blundell and Bond, 1998). In this case, it is also necessary to watch-out for a proliferation of instruments that may over-fit endogenous variables, and make sure that the model passes both tests of instrument validity (Sargan/Hansen) and second-order serial correlation (Arellano and Bond, 1991).

Rule of thumb two (the second approach) is a decision between difference and system GMM, and select the proper estimator by estimating the data using a pooled OLS, fixed effect and difference GMM models, and verify the coefficients of the lagged dependent variables of the three models. In case when the coefficient of the lagged dependent variable of the difference GMM is close to

or below the fixed effect estimate, this suggests that the former estimate is downward biased because of weak instrumentation, and hence advisable to use a system GMM (Bond, 2001).

In line with the second approach, evaluations were made on the sample data to decide whether to use a difference or system GMM estimator and assess the drivers of financial inclusion. Accordingly, the estimation results of the three models are stated below.

i) Pooled OLS estimation result of the lagged dependent variable is **0.981**, which is biased upward and become the **upper bound estimate.**
ii) Fixed effect estimation result of the lagged dependent variable is **0.926**, which is biased downward and become the **lower bound estimate, and**
iii) Difference GMM model estimation results of the lagged dependent variable is **0.601 (one step) and 0.493 (two step)**.

On the basis of the regression results of the three models, it is learned that the estimated difference GMM coefficient of the lagged dependent variable (0.601) is below the fixed effect model (0.926), and suggests that the former estimate is downward biased, and hence it is a more appropriate to use a system GMM. In the same manner, evaluations were made on three related models to decide whether to use difference or system GMM estimator so as to assess the drivers of financial stability (measured by Z-Score). Regression results of the three equations show that the difference GMM estimation coefficient of the lagged dependent variable (0.104) is below the fixed effect estimation, and hence the former estimate has downward bias, and the system GMM is used instead.

i) Pooled OLS model estimation result of the lagged dependent variable is **0.745**, which is biased upward and become the **upper bound estimate.**
ii) Fixed effect model estimation result of the lagged dependent variable is **0.602**, which is biased downward and become the **lower bound estimate, and**
iii) Difference GMM model estimation results of the lagged dependent variable is **0.104 (one step) and 0.171 (two step)**.

On the bases of the above results, the study employed the system GMM. The system GMM is more efficient and robust than the difference GMM as it enhances efficiency while examining the key

drivers of financial inclusion. In addition, the decision to use system-GMM dynamic panel estimator, which compiled of first-differences instrumented on the lagged levels, and the levels instrumented on lagged first-differences, prevents endogeneity bias (Blundell and Bond, 1998). Wooldridge (2010) stated that the dynamic panel system GMM estimator is more robust and tackles measurement error. It also addresses the common problems of heteroscedasticity, autocorrelation of errors, and simultaneity bias. It also remains steady if the instrumental variables are adequately lagged to the model.

B. Determinants of Financial Inclusion

There are various macroeconomic and microeconomic drivers of financial inclusion (FI) across regions and nations (Zins and Weill, 2016; Rao and Baza, 2017; Singh, Sikdar and Chaturvedi, 2017; Abel, Mutandwa and Le Roux, 2018; Allen *et al.,* 2018; Ozili, 2019). While identifying these factors, some researchers used individual indicators such as DCB, CBB, NAT, PCG as a proxy to financial inclusion and others constructed a composite index. Considering the merits of constructing a composite index rather than adopting individual indicators as a proxy for financial inclusion, this research used the composite financial inclusion index constructed above to assess the determinants of financial inclusion in the SSA countries.

Consequently, the financial inclusion index is taken as a dependent variable and the explanatory variables were selected based on data availability and their theoretical application. Explanatory variables that are used in the study include GDP per capita (LnGDPPc), financial stability (ZScore), Broad money supply to GDP (LnSFS), Inflation (INF), Government expenditure (GEXP), Institutional quality (IQI) and Adult literacy rate (LIT), Mobile subscription to total population (MU), Internet subscription to total population (IUG), Bank credit to bank deposit (BCBD), Bank cost to income ratio (BCI) and Profitability of banks (NIM). In order to assess the key drivers of financial inclusion among the stated indicators, this study used the model specified below.

$$FI_{i,t} = \dot{\alpha} + \beta_1 FI_{i,t-1} + \beta_2 FS_{i,t} + \beta_3 EG_{i,t} + \beta_4 \sum_{n=1}^{i} X_{i,t} + \varepsilon_{i,t} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (19)$$

Where: $FI_{i,t}$ – financial inclusion index, $FI_{i,t-1}$ – lag of the financial inclusion, $FS_{i,t}$ – Financial stability (proxied by ZScore), $EG_{i,t}$ – Economic growth (represented by GDP per capita), $X_{i,t}$ – explanatory variables stated above.

On the basis of the decision made between difference and system GMM models, the system GMM is applied for the model so as to identify the key drivers of financial inclusion in the selected SSA countries. Estimation results of the model revealed that both macroeconomic and microeconomic factors drive financial inclusion in the SSA countries. Consistent with the various research findings, this study identified a number of significant positive and negative drivers of financial inclusion in the selected economies. Table 13 below summarises the regression analysis results of this study.

Table 14: Key drivers of Financial Inclusion in the selected SSA Countries

Variables	(Financial Inclusion) One Step System GMM	(Financial Inclusion) Two Step System GMM
L.FI	0.9266***	0.9044***
	(0.2055)	(0.2050)
ZScore	-0.0033***	-0.0033***
	(0.0008)	(0.0012)
LnGDPPc	0.0296***	0.0260*
	(0.0093)	(0.0132)
LnSFS	0.0647**	0.0663*
	(0.0260)	(0.0344)
INF	0.0005*	0.0005**
	(0.0003)	(0.0002)
GEXP	0.0016	0.0007
	(0.0021)	(0.0029)
MU	-0.0003	-0.0002
	(0.0005)	(0.0005)
LIT	0.0002	0.0004
	(0.0005)	(0.0006)
IQI	-0.0350	-0.0347
	(0.0265)	(0.0264)
BCI	-0.0009**	-0.0009**
	(0.0004)	(0.0004)
NIM	0.0097**	0.0105**
	(0.0041)	(0.0048)
BCBD	0.0008**	0.0009**
	(0.0003)	(0.0004)
IUG	-0.0001	-0.0001
	(0.0002)	(0.0002)
Constant	-0.5041***	-0.5041***
	(0.1513)	(0.1763)
Observations	494	494
Number of countries (Instruments)	26	26
AR(1) (Prob > Z)	0.00196	0.00537
AR(2) (Prob > Z)	0.866	0.816
Hansen (Prob > Chi2)	0.224	0.224
Sargan (Prob > Chi2)	0.0363	0.0363

Source: Author's own computations

Notes: *Robust standard errors in parentheses (***) signifies variable significant at 1%; (**) significance at 5%; (*) significance at 10%. Moreover, AR(2) (Prob>Z is expected to be Insignificant); Hansen (Prob > Chi2 should be between 0.1 and 0.3)*

On the basis of the regression results above, one of the major findings of the study is that the lag of financial inclusion index has a strong positive and significant influence on the current and future financial inclusion, indicating a catches-up effect. Results of the analysis indicate that the lagged coefficient of financial inclusion is above zero and around one. When the lag coefficient is zero, it indicates a full catch. When the coefficient is between zero and one, it indicates a partial catch-up. In this study, the coefficient of the lag of financial inclusion is around one, implying that the selected SSA countries are aggressively expanding their financial services, and hence tend to recover most of the financial inclusion deficit experienced in the past. It also indicates that the countries are rapidly moving including the excluded segment of the population to the formal financial system. Evans and Adeoye (2016) reached similar findings on their empirical study made in Africa. On the basis of this result, it is possible to conclude that the SSA economies are recovering most of the excluded populations and expand their financial services.

Financial stability is another important driver of financial inclusion in the selected SSA countries. Researches show mixed results on the relationship between financial stability and financial inclusion. Some scholars argue that financial expansion through extending credits to large number of households and businesses may erode the quality of loan portfolios and undermine financial stability in cases where there is weak supervision (Khan 2011; Sahay et al., 2015). Consistent with the above findings, financial stability, proxied by financial distress (Z-Score) has a strong negative and significant effect on financial inclusion across the selected SSA countries. This implies that financial instability in the financial system leads to frustration within the population and potential users of financial services and affect the possibility of expanding the use of financial services. Abel *et al.* (2018) identified public confidence on the financial system as an important factor for financial inclusion in Zimbabwe.

GDP per-capita, which is a proxy for economic growth, is one of the major drivers of financial inclusion in the SSA countries. Increase in per-capita income of individuals and households raises the possibilities of saving and investment, which has a close tie with the use of financial services and financial inclusion. Financial inclusion, although a universal goal as reflected in the United Nations Sustainable Development Goals (UNSDGs) and the Africa Union (AU) 2063 Agenda, is imperative for the developing countries where there is low adoption and use of formal financial products and services is typically low (Demirgüç- Kunt et al., 2015). Consistent with Park and

Mercado (2015) and Asuming, Osei-Agyei and Mohammed (2019), this study found that per-capita income has a positive and significant effect on the financial inclusion of the SSA countries, indicating that increase in per-capita income raises the interest of individuals and households to access and use financial services, which in-turn improves the inclusiveness of the financial system.

Unlike some scholars who argue that there is strong relation between consumption and GDP in low and middle-income countries, i.e. economic growth promote consumption than saving and investment (Diacon and Maha, 2015; Kim, 2017 and Yildirim and Yildirim, 2017), this research found that increase in economic growth (per-capita income) promotes use of financial services and savings than consumption. The coefficient of GDP per capita is positive and significant at 5%, implying that countries with a high GDP per capita have high levels of financial inclusion. This finding is consistent with those of several other empirical studies that are conducted to assess the determinants of financial inclusion (Yorulmaz, 2016; Soumare, Tchana and Kengne, 2016; Evans and Adeoye, 2016; Neaime and Gaysset, 2017; Allen *et al.,* 2018). In all these studies, it is indicated that increase in per-capita income increase access to financial services, and thereby financial inclusion.

Several scholars use financial deepening (M_2/GDP) as a measure of the size of the financial sector. King and Levine (1993) used financial deepening (M_2/GDP) as a measure of the size of the financial sector and found a positive relationship between financial depth and economic growth. Other studies also indicated the depth of financial service, which is expressed as the ratio of broad money (M2) to GDP, to have a positive and significant impact on financial inclusion (Evans and Adeoye, 2016). Optimal level of financial inclusion can be achieved when basic financial services are accessible and available to all at a reasonable and economical price that encourage financial services providers are ready to provide such financial services on a continual basis (Ozili, 2021). Consistent with the findings of the above researches, this study also confirmed a significant positive effect of financial depth on financial inclusion, at 5% significant level. It revealed that those economies with a relatively large size of financial sector have the possibility to raise their level of financial inclusion. Hence, in order to raise the level of financial inclusion in SSA countries, it is advisable to expand the size of the financial sector by adopting low cost financial products and services, and expanding the business correspondents or facilitators at the grassroots level.

Higher inflation leads to macroeconomic instability, as it erodes the nominal income and negatively affects the low income group of the population (Boukhatem, 2016; Inoue, 2018; Zhang and Naceur, 2019). Inflation also has a negative impact on the financial inclusion index and net national income and positively affects interest rate (Huong, 2018). El Sherif (2019) argued that there is a negative and significant relationship between financial inclusion and inflation rate in Egypt. In the same manner, Ajide (2017) identified a negative and significant effect of inflation on financial inclusion. On the other hand, Matsebula and Sheefeni (2022) found positive and significant relationship between financial inclusion and inflation. Evans and Adeoye (2016) argued that inflation is not a significant factor for financial inclusion. Some of the reasons for variation of findings may be the proxy variables used for financial inclusion and the size and number of the samples. Evans and Adeoye (2016) and Matsebula and Sheefeni (2022) took the number of depositors with commercial banks per 1,000 adults as proxy for financial inclusion, which gives only partial information for the multidimensional indicator (FI). Unlike the findings of Huong (2018) and El Sherif (2019), this research identified inflation as one of the important drivers of financial inclusion in the SSA countries. The regression results of this study clearly show that financial inclusion has a significant positive effect on financial inclusion of the stated economies, and hence it is consistent with the findings of Matsebula and Sheefeni (2022).

Bank credit to bank deposits is another important microeconomic driver for financial inclusion. Regression results above indicated that bank credit expansion relative to deposit has a positive and significant effect on the level of financial inclusion. This implies that credit expansion to potential user attracts the unbanked groups of the populations and contributes for financial inclusion. This finding is consistent with other empirical studies that signify larger banks have greater ability to reach a more diverse set of populations and increase financial inclusion (Kosmidou, 2008; Eza and Jackson, 2018).

Financial institutions such as banks give more emphasis to improve existing services or introduce new products to meet the needs of customers and achieve higher returns for optimal performance. Banks open new bank branches, install more ATMs, or implement new digital facilities as strategies to improve profit, especially if the costs are not linked to sales revenues (Shihadeh *et al.,* 2018). Consistent to some earlier researches that assess the impact of financial inclusion on the

performance of financial institutions, this study tried to assess the impact of specific institutional variables such as BCI (bank cost to income ratio) and NIM (bank profitability measured by net interest margin) on financial inclusion. Regression results of the study clearly indicated that bank cost to income ratio has a negative and significant effect on the level of financial inclusion, i.e. rise in the cost to income ratio of financial institutions limits the scope of operation and financial inclusion. Studies show that the choice of business model, i.e. portfolio mix and funding structures has influence on risk and return of banks and thereby financial inclusion (Demirgüç-Kunt and Huizinga, 2010; Ayadi and De Groen, 2014).

On the other hand, profitability of banks has a positive and significant effect on financial inclusion, i.e. profitability of the financial institutions significantly contributes for financial service expansion across the SSA countries, and thereby financial inclusion. This result is consistent with the findings of other scholars who found positive and significant relationship between financial inclusion and profitability (Shihadeh *et al.,* 2018; Shihadeh and Liu, 2019; Jouini, 2021). Commercial banks share profits while competition raises in the markets, and hence increase their financial service quality and quantity to obtain extra profits through credit expansion and this facts can increase financial inclusion, which may lead to financial instability (Mengistu and Saiz, 2018; Pham and Doan, 2020; Feghali *et al.,* 2021).

Various empirical studies endorsed other macroeconomic and microeconomic variables such as LIT (adult literacy rate), IQI (institutional quality), GEXP (government expenditure), MU (mobile subscription), and IU (internet subscription) as important determinants of financial inclusion (Evans and Adeoye, 2016; Ajide, 2017; Islam *et al.,* 2016; Ozili, 2019; Demirgüc-Kunt *et al.,* 2018). Specifically, internet and mobile subscription seems insignificant in this study because of the low level financial technology adoption and use in most the selected SSA countries, which may open a room for country specific investigation of these factors. In addition, this research revealed that other important variables also do not seem to have significant impact on the financial inclusion of the selected SSA countries, which may require further specific assessment on the area.

C. Determinants of Financial Stability in the selected SSA Countries

Several macroeconomic and microeconomic factors drive financial stability. However, the level of influence of these factors varies across regions and countries. Studies that were conducted to assess the determinants of financial stability used either individual indicators or composite index as proxy for financial stability. Despite the merits of using a composite index, most of the empirical studies adopted financial distress (Z-Score) as proxy for financial stability (Adusei, 2015; Ali and Puah, 2019; Siddik *at el.*, 2018). One of the reasons for adopting individual indicators is that there is no universally accepted approach to construct a comprehensive indicator for financial stability and systemic risks. On the other hand, the probabilistic measurement nature of Z-Score and its capability of predicting the financial distress and risk of solvency of banks makes it the most widely used indicator of financial stability (Lepetit and Strobel, 2015).

On the basis of the arguments stated above, this study used an individual indicator (Z-Score) as a proxy variable for financial stability. Z-Score measures the risks of solvency and a greater value of z-score represents a greater financial stability. Z-Score is taken as a dependent variable that measures the level of financial system stability. In addition, explanatory variables with a reach data were included in the study. Consequently, major explanatory variables used in the analysis include the lag of financial stability (l.ZScore), financial inclusion (FI), GDP per capita (LnGDPPc), percentage of liquid assets to deposits and short-term funding (LP), income inequality (GINI), Institutional quality (IQI), proportion of mobile subscribers to the total populations (MU), bank profitability (NIM), proportion of bank credit to bank deposit (BCBD), deposit interest rate (DIR), real interest rate (RIR) and global financial crises (GFC). Kodongo and Ojah (2016) argued that it is logical to capture the potential effects of the global financial crisis of the 2007 and 2008 using time dummies. It takes the value 1 (one) for the two years (2007 and 2008), and 0 (zero) for all the remaining years. In order to assess the major drivers of financial stability, the relationship of the variables is specified below.

$$FS_{i,t} = \dot{\alpha} + \beta_1 FS_{i,t-1} + \beta_2 FI_{i,t} + \beta_3 EG_{i,t} + \beta_4 \sum_{n=1}^{i} X_{i,t} + \varepsilon_{i,t} \ldots\ldots\ldots\ldots\ldots\ldots \quad (20)$$

Where: $FS_{i,t}$ – financial stability (proxied by ZScore), $FS_{i,t-1}$ – lag of the financial stability, $FI_{i,t}$ – Financial inclusion, $EG_{i,t}$ – Economic growth (represented by GDP per capita), $X_{i,t}$ – explanatory variables stated above.

On the basis of the decision made between the difference and system GMM estimators, the system GMM is applied so as to identify the major drivers of financial stability in the selected SSA countries. Results of the analysis indicated that the lag of financial stability (l.ZScore) has a positive and significant impact on its current financial stability and would thus indicate a catch-up effect. If a lagged financial stability coefficient equal to zero, it implies a full catch-up. If a lagged financial stability coefficient between zero and one, it implies a partial catch-up. In this dynamic system GMM estimation, the lagged coefficient of financial stability is found between zero and one, implying a partial catch-up. This implies that countries with stable financial system in the past have the possibility to become a stable in the current and future periods and vice versa. Summary of the regression results of the model is provided in table 14 below.

Table 15: Major drivers of financial stability in the selected SSA economies

Variables	(Financial Stability) One Step System GMM	(Financial Stability) Two Step System GMM
L.ZScore	0.4243**	0.3937***
	(0.1524)	(0.1343)
FI	19.0614***	18.4573***
	(6.2081)	(6.5709)
LnGDPPc	-1.1370	-0.6109
	(1.8117)	(1.4285)
GINI	25.1319	19.7795
	(24.7922)	(25.0367)
IQI	-1.5346*	-1.4096*
	(0.8381)	(0.7991)
MU	-0.0381**	-0.0358
	(0.0181)	(0.0229)
DIR	-0.0176	-0.0189
	(0.1125)	(0.1164)
LP	-0.0446	-0.0324
	(0.0349)	(0.0318)
NIM	0.1729	0.2218
	(0.3384)	(0.3394)
BCBD	0.0268	0.0258
	(0.0360)	(0.0440)
RIR	-0.0102	-0.0051
	(0.1071)	(0.0674)
GFC	-1.3320*	-1.0312*
	(0.6548)	(0.5280)
Constant	-3.0738	-3.9743
	(15.5946)	(11.3515)
Observations	494	494
Number of ID (Instruments)	26	26
AR(1) (Prob > Z)	0.0749	0.126
AR(2) (Prob > Z)	0.557	0.652
Hansen (Prob > Chi2)	0.199	0.199
Sargan (Prob > Chi2)	0.0147	0.0147

Source: Author's own computations

Notes: *Robust standard errors in parentheses (***) signifies variable significant at 1%; (**) significance at 5%; (*) significance at 10%. Moreover, AR(2) (Prob>Z is expected to be Insignificant); Hansen (Prob > Chi2 should be between 0.1 and 0.3)*

Financial inclusion may have a positive or negative effect on financial stability. Financial product expansion, low deposit volatility, good transmission of monetary policy reduces financial and liquidity risks and has a positive effect on financial stability. In line with this fact, several scholars argue that financial inclusion has a positive and significant effect on financial stability (Vo *et al.,* 2021; Al-Smadi (2018) De la Torre *et al.,* 2013; Morgan and Pontines, 2014; Dienillah and Anggraeni, 2016; Ahamed and Mallick, 2019; Anarfo and Abor, 2020). On the other hand, financial inclusion has an adverse effects in terms of erosion of credit standards, inefficient application of financial regulations and increase in risks of eroding institutional reputation, and hence some scholars argue that financial inclusion has a negative consequence on financial stability unless there is a proper supervision on the financial system (Cihak *et al.,* 2016; Khan, 2011).

Regression results of this study indicated that financial inclusion has a positive and significant impact on the financial stability of the SSA economies, implying that the more the inclusiveness of the financial system the lower the probability of default. On the other hand, the greater the number of financial system participants, the lower the probability of default. Contrary to the research findings that indicate the existence of a negative and significant impact of financial inclusion on financial stability (Khan, 2011; Sahay *et al.,* 2015; Cihak *et al.,* 2016), the finding of this study is consistent with the findings of several other authors that asserted financial inclusion have a significant positive and effect on financial stability (Han and Melecky 2013; Morgan and Pontines 2014; Ahamed and Mallick, 2019; Anarfo and Abor, 2020). Despite weaknesses in the supervisory capacity, poor regulatory frameworks, low per-capita income and low level of financial literacy, financial inclusion through broader access to and use of finance significantly improves the overall financial system resilience and thus financial stability in the SSA countries.

Institutional quality, which is a composite index for the six governance indicators, is found to be another important driver of financial stability in the selected SSA countries. Fratzscher *et al.* (2016) argued that tightening of financial regulation may affect credit growth, and hence a strict regulation forces banks to reduce lending, i.e. stringent supervision and regulation affects aggregate credit growth, which may improve banking system stability. Consistent with the above argument, estimation results of the study revealed that institutional quality has a negative and significant effect on financial stability, which implies that a stringent financial supervision and

regulation enhances financial stability in the selected SSA countries.

Expansion of mobile subscriptions is contributing for expanding access and use of financial services. Unless properly regulated, the credit expansion through technology may lead to credit default and hence affects financial system stability. Consistent to this view, regression results of the one step system GMM indicated that expansion in mobile subscriptions has a negative and significant effect on financial stability. However, this study did not find significant relationships between technology adoption and financial inclusion because of the fact that majority of the selected sub-Saharan Africa countries are found at their early level of financial technology adoption and utilisation.

Since this study covers the period between 2000 and 2019, it is reasonable to examine and control the effects of the global financial crisis that happened during 2007 and 2008. Regression result of the study shows that the global financial crises have a negative and significant effect on the financial stability of the selected SSA economies. The result of the assessment is consistent with the findings of researchers that found the negative impact of global financial crisis on financial stability (Noman *et al.,* 2017). According to Atellu, Muriu and Sule (2021), the global financial crisis of the 2007/2008 was a good indicator that financial regulation alone is not sufficient to promote financial stability and therefore, it is necessary to use other measures such as financial inclusion to address similar problems.

Other macroeconomic and microeconomic variables such as economic growth, deposit interest rate, liquidity position, profitability, credit to deposit ratio and real interest rate seem less significant in terms of impacting the financial stability in the SSA economies. However, other researches advocate the importance of some indicators such as economic growth, liquidity position, credit to deposit ratio, deposit interest rate for financial stability (Han and Melecky, 2013; Morgan and Pontines, 2014). Some argued that financial institutions with greater liquidity are subject to a low probability of default and greater financial stability (Han and Melecky, 2013). Unlike the findings of Sango and Moussa (2017) who found a positive impact of interest rate on the financial stability, interest rate did not seem to have any effects on financial stability.

6.2.7 Panel Cointegration and Granger Causality Tests

On the basis of the results from the unit root tests, the study concluded that there is a mixed integration among the series, i.e. the variables used in the study are integrated of order I(0) and I(1). Once stationarity of each variable is ascertained, the next step is to conduct a cointegration test. A cointegration testing is usually conducted to detect the existence of a long run relationship among the variables under study and avoid the possibility of a spurious regression (Granger, 1986). On the basis of the results of the panel cointegration test, this study applied the ARDL cointegration test. In addition, given the relatively short time span of the dataset, which is 20 years, and the mixed stationarity nature of the data series (I(0) and I(1)), it is not proper to apply the conventional panel cointegration approaches, namely Kao, Pedroni, or Westerlund. This is because all the three conventional panel cointegration tests assume the same order of integration across variables. It is, therefore, advisable to use a panel Autoregressive Distributed Lag (ARDL) cointegration test (Pesaran, Shin and Smith, 1999).

Subsequently, before conducting the cointegration tests, assessment was made on the dataset to determine the optimal lag lengths of the panel. In this case, consistent to the nature of the datasets, which is a dynamic panel data, the optimal lag lengths of the panel and the variables were examined using unrestricted error correction model and information criterion so as to decide on the optimal lag lengths of each panel and variable. Accordingly, analysis was conducted on each of the twenty six countries and then the most common lag lengths of the variables is identified and used as an optimal lag length for the variables and the model. A summary of the optimal lag lengths of the variables and the panel is presented in table 15 below.

Table 16: Optimal lag lengths of the variables

Variables	LnGDPPc	FI	FS (ZScore)
Economic Growth **(LnGDPPc)**	1	0	0
Financial Inclusion **(FI)**	0	1	1
Financial Stability **(FS)**	0	0	1

On the basis of the analysis result, when economic growth (LnGDPPc) becomes the dependent variable, the optimal lag lengths of the model and the variables becomes (LnGDPPc (1), FI (0) and FS (0)) i.e. it takes the ARDL order (1, 0, 0), respectively. However, when FI becomes the

dependent variable, the optimal lag lengths of the ARDL model and the variables takes the form FI (1), LnGDPPc (0) and FS (1), i.e. (1, 0, 1). When FS becomes a dependent variable, the optimal lag lengths of the model and the variables take the form FS (1), LnGDPPc (0) and FI (0), i.e. (1, 0, 0).

A. Dynamic Panel ARDL Cointegration Tests

Loayza and Rancière (2004) argued that the usual standard panel data analysis models such as pooled OLS, fixed effects, or random effects do not help to distinguish between the short-run and long-run relationships between variables. In these conventional panel models, the parameters can be biased in case when some of the regressors are endogenous (Campos and Kinoshita, 2002). It is, therefore, necessary to use a proper model that addresses similar shortcomings. In order to address these limitations, the Panel Autoregressive Distributed Lag (ARDL) technique seems appropriate. In fact, one of the main advantages of this method is its validity in case when the variables have different orders of integration, i.e. when the variables are in a mixture of order I(0) or I(1) (Pesaran and Shin, 1995).

On the basis of the dataset and results of the panel unit root tests, the study applied the panel ARDL cointegration test to examine the relationships between the three variables (EG, FI and FS). The panel ARDL cointegration test generates the ECM equation for each dependent variable. The ECM equation provides information about the nature of causality and the speed at which the dependent variable returns back to equilibrium after every shock through the estimated coefficient of the error correction term. The panel ARDL cointegration test uses both lagged and differenced variables to assess the existence of cointegration within the variables. Unlike the bound cointegration estimation model, which is mostly applicable for time series data, this research is based on dynamic panel data, and used the Mean Group (MG), and Pooled Mean Group (PMG) estimators (Pesaran and Smith, 1995; Pesaran et al., 1999). Specifications of the panel ARDL cointegration models that are used to examine the relationship between the three variables are stated below.

$$\Delta FI_{i,t} = \Pi + \theta_i[FI_{i,t-1} - \lambda_1 FS_{i,t-1} - \lambda_2 EG_{i,t-1}] + \sum_{j=1}^{p-1} \pi_{ij} \Delta FI_{i,t-j} + \sum_{j=0}^{q-1} \beta_{ik} \Delta FS_{i,t-k} + \sum_{l=0}^{n-1} \alpha_{il} \Delta EG_{i,t-l} + \emptyset_i + e_{it} \quad \text{(21)}$$

$$\Delta FS_{i,t} = \Pi + \Theta_i[FS_{i,t-1} - \lambda_1 FI_{i,t-1} - \lambda_2 EG_{i,t-1}] + \sum_{j=1}^{p-1} \pi_{ij} \Delta FS_{i,t-j} + \sum_{j=0}^{q-1} \beta_{ik} \Delta FI_{i,t-k} + \sum_{i=0}^{n-1} \beta_{il} \Delta EG_{i,t-l} + \emptyset_i + e_{it} \quad \text{..... (22)}$$

$$\Delta EG_{i,t} = \Pi + \Theta_i[EG_{i,t-1} - \lambda_1 FI_{i,t} - \lambda_2 FS_{i,t}] + \sum_{j=1}^{p-1} \pi_{ij} \Delta EG_{i,t-j} + \sum_{j=0}^{q-1} \beta_{ik} \Delta FI_{i,t-k} + \sum_{i=0}^{n-1} \beta_{il} \Delta FS_{i,t-l} + \emptyset_i + e_{it} \quad \text{..... (23)}$$

Where: θ_i = - (1- α_i) group specific speed adjustment coefficient (expected that $\Theta_i < 0$); λ_2 = vector of the long run relationships, ECT – the error correction term, which is presented in the parenthesis [ ], π_{ij} β_{1j} and β_{2j} represents the short term dynamic coefficient, Δ Represents the first difference operator, $EG_{i,t}$, $FI_{i,t}$ and $FS_{i,t}$ are the respective dependent variables. EG (log of the per-capita income); FI (composite indicator of six variables), and FS (Z-Score), for country i at time t. $\emptyset_i$ represents the unit specific fixed effects. e_{it} is a random error term.

In order to examine the relationship between the three variables, i.e. FI, FS, and EG, the above models are estimated using the two alternative estimators, namely the Mean Group (MG), the Pooled Mean Group (PMG). In this research, the dynamic fixed effects (DFE) estimator was not applied due to the nature of the dataset. This estimator requires a large set of data with long time span. The two panel ARDL estimators are used to examine the short and long run relationship between the variables.

In the first model, the relationship between financial inclusion (FI) and the two regressors, financial stability (FS) and economic growth (LnGDPPc) is analysed using the mean group (MG) and pooled mean group (PMG) estimators. Results of the panel ARDL tests of the two estimators revealed that there is variation in their output. A summary of the regression results for the two estimators is presented in table 16 below.

Table 17: Panel ARDL Estimations results of the three variables (FI, FS and LnGDPPc)

Variables (Dependent Variable FI)	Mean Group (MG)	Pooled Mean Group (PMG)
Short Run		
ETC	-0.2068*** (0.034)	-0.1814*** (0.0274)
ΔZScore	-0.0013** (0.0007)	-0.0012 (0.0007)
ΔLnGDPPc	-0.0082 (0.0064)	-0.0122** (0.0059)
Constant	-0.1078*** (0.0345)	-0.0044 (0.0057)
Long Run		
Z-Score	-0.0015 (0.0051)	0.0043*** (0.0011)
LnGPPc	0.1132*** (0.0341)	0.033*** (0.0027)
Number of Obs	494	494
Number of Group	26	26
Hausman	Between mg pmg Prob>chi2 = 0.3594	

Source: Author's own computations

Note: *Robust standard errors in parenthesis (***), (**), (*) indicates the level of significance at 1%, 5% and 10%, respectively.*

On the basis of the results shown in the table above, the short run error correction term (ETC) is significant across the estimators. This implies that there is a long-run cointegration among the variables in the panel at 1% level of significant. On the other hand, regardless of the estimator applied, economic growth has a significant and positive influence on financial inclusion in the long run. However, financial stability and economic growth have significant negative effects on financial inclusion in the short run, in both estimators (MG and PMG). This implies that the level of financial inclusion is affected by financial stability and economic growth both in the short run and long run. In addition, financial stability has a significant positive effect in the case of the PMG

estimator, implying that stability is necessary for financial inclusion.

It is well known that the two estimators (MP and PMG) are consistent under specific assumptions. In order to distinguish between the MG and PMG, and determine whether there are significant differences among these estimators, the study applied the Hausman test. The Hausman test helps to identify the most appropriate estimator for the proposed relationships (Hausman, 1978). It helps to assess the best estimator and achieve consistency and efficiency in the study. Consequently, the result of the Hausman test revealed that the PMG is more efficient and consistent compared to the MG. It is, therefore, possible to conclude that PMG is the most appropriate estimator in these relationships.

In line with the results of the analysis made using the pooled mean group (PMG) estimator, it is possible to conclude that there is a long run cointegration across the three variables at 1% level of significance. In addition, the error correction term (ECT) and the short- and long run coefficients are significant at 1% and 5%, respectively, indicating the existence of a strong causality between the dependent and explanatory variables. This implies that any deviation from the long run equilibrium is corrected at an adjustment speed of around 18%. In line with the results derived from this method, an increase in GDP per-capita has both negative and positive impacts on financial inclusion at the 5% and 1% levels of significance in the short run and long run, respectively. However, this does not mean that the relationship between the variables within the individual country is consistent with the stated results.

Country-specific examination of the variables indicated that financial stability have long run effect on the financial inclusion of countries such as Ethiopia, Burundi, Democratic Republic of Congo, Botswana, and South Africa, affirming that financial stability is critical to ensure the financial inclusion of both low and middle income SSA countries. On the other hand, economic growth has a long run effect on the financial inclusion of countries such as Malawi, Tanzania, Ghana, Guinea, Nigeria, Gabon, Chad, Democratic Republic of Congo and Equatorial Guinea, confirming that economic growth is critical for financial inclusion of both the low and middle income SSA countries. On the basis of the above results, it is possible to conclude that there are other country specific factors that contribute for the level of financial inclusion across the nations under investigation.

Consistent with the findings of Khan (2011) and Naceur and Ghazounai (2007), which shows a negative relationship between financial inclusion and economic growth, this study found a significant (at 5% level of significance) negative and relationship between financial inclusion and economic growth. One of the explanations for the short run negative and significant impact of the per-capita income on financial inclusion may be the high income inequality that exists in the region. High income inequality in the SSA countries may indicate high concentration of per capita income to small group of the society, which may not contribute to financial inclusion. Collins and Ng'weno (2018) indicated that financial services have seen remarkable growth over the past consecutive years. However, there is no clear evidence which shows that it is improving the lives of the poor, indicating economic growth may not increase the per capita income of the mass. It rather improves the wealth of the small rich individuals. In this case, economic growth may not have the impact or negatively affect financial inclusion as the rich people may use the opportunity to spend out in the short run. Dupas *et al.* (2018) argued that expansion in the basic bank accounts did not have a significant effect on savings because of the inability to predict how households would use their income.

On the other hand, consistent with the findings several scholars who supported the long run positive and significant relationship between financial inclusion and economic growth, this study found a significant positive relationship between the two variables. Kim et al. (2018), and Ali and Khan (2020) proved that there is a positive and significant relationship between financial access and economic growth. According to the findings of the studies, financial inclusion can significantly improve household income and thereby the well-being of the people. Cihak et al. (2016) identified a higher economic growth rate in those sectors that relied on external finance in countries that have greater financial depth, indicating that financial inclusion positively affects economic growth by reducing financial constraints of small and medium firms. Kim, Yu, and Hassan (2018) found a significant positive influence of financial inclusion on economic growth in the Organization of Islamic Cooperation (OIC) countries. The panel vector autoregression test result confirmed that there are positive and mutual causalities between financial inclusion and economic growth. Fanta and Makina (2019) asserted that inclusive financial services ensure accessibility, availability and usage of formal financial services to the marginalised group of a population and thereby enhancing economic growth. Neaime and Gaysset (2017), on their study in the Middle East and North Africa,

argued that there is a significant negative relationship between financial inclusion, income inequality and poverty rate.

Moreover, the output of the PMG analysis indicated that financial stability has a positive impact on financial inclusion at the 1% level of significance in the long run. This implies that financial stability encourages people in the SSA countries to have the trust to utilise financial services, indicating financial stability is contributing to financial inclusion. Scholars suggested both positive and negative relationships between financial inclusion and financial stability. Consistent with the findings of Morgan and Pontines (2014) and Anarfo *et al.*, (2020), this study found a positive and significant relationship between financial stability and financial inclusion. Anarfo *et al.*, (2020) argued that financial stability has a strong positive effect on financial inclusion as there is a strong relationship between financial regulation and financial inclusion. Stable financial institutions provide proper financial products and services and significantly contribute to the expansion of financial inclusion (Musau *et al.,* 2018). It is, therefore, critical to develop and introduce a proper regulation that helps to ensure financial stability and promote financial inclusion (Musau *et al.,* 2018; Anarfo *et al.,* 2020).

Contrary to the finding of Khan, (2011), Dupas *et al.,* (2012), Mehrotra and Yetman, (2015) and Cihák *et al.,* (2016), who confirmed the existence of a significant negative relationships between financial inclusion and financial stability, this study identified positive and significant relationship between financial inclusion and financial stability. According to the results of these studies, financial instability that arises from poor regulation and supervision may reduce the reputation and trust of financial institutions, erode public confidence and thereby affects financial inclusion. Anarfo *et al.* (2020) argued that strengthening financial regulation in the Sub-Saharan African countries contributed for stability but it reduced financial inclusion. Financial regulations help to ensure financial stability and reduce problems linked to unsustainability of financial institutions through affecting credit growth. Some of the recent studies also support the argument that financial regulation hinders financial inclusion (Anarfo *et al.,* 2020; Igan and Mirzaei 2020; Gupta and Kashiramka, 2020)

Effort is also made to assess the impact of economic growth and financial inclusion on financial stability of the SSA countries. Table 17 below provide the short-and-long run impacts of economic

growth (LnGDPPc) and financial inclusion (FI) on financial stability (ZScore) using the two estimators (PMG and MG). In this model, financial stability is treated as the dependent variable while economic growth and financial inclusion are taken as regressors. The panel ARDL estimation of the two estimators shows that there is a slight variation across results.

Table 18: Panel ARDL Estimations results of the three variables (LnGDPPc, FI and FS)

Variables (Dependent - FS)	**Mean Group (MG)**	**Pooled Mean Group (PMG)**
Short Run		
ETC	-0.824*** (0.062)	-0.540*** (0.065)
ΔLnGDPPc	0.569 (0.961)	0.160 (1.206)
ΔFI	-20.458 (14.542)	-0.461 (13.978)
Constant	19.311 (12.13)	6.756*** (0.8903)
Long Run		
LnGDPPc	-1.557 (1.792)	-0.286 (0.318)
FI	9.294 (9.684)	1.911 (2.375)
Number of Obs	494	494
Number of Group	29	26
Hausman mg pmg	Prob>chi2 = 0.7796	

Source: Author's own computations

Note: *Robust standard errors in parenthesis (***), (**), (*) indicates the level of significance at 1%, 5% and 10%, respectively.*

On the basis of the result in Table 14 above, it is possible to conclude that there is long run cointegration between the variables under investigation as the error correction term is significant at 1%, indicating joint causality across the variables used in the panel. This implies that financial inclusion and economic growth together have long run significant impact on financial stability. In

the table above, it is possible to observe consistency across in the results of the two estimators. However, the Hausman test ascertained that the pooled mean group (PMG) is more efficient and consistent over the mean group (MG), and hence it is more appropriate to use the analysis results of the pooled mean group (PMG) while examining the relationship between the variables.

On the basis of the analysis, the relationships between the individual variables seem not significant both in the short-and-long run across the two estimators. However, this does not mean that this relationship is consistent across all countries under study. Country specific examination indicated that financial inclusion have long run effect on financial stability of countries such as Niger, Gabon, Angola, Botswana, South Africa, and Mozambique, indicating financial inclusion is contributing to the financial stability of some of the middle income SSA countries. On the other hand, economic growth have long run effect on the financial stability of countries such as Ethiopia, Rwanda, Sierra-Leone, Gabon, Chad, Democratic Republic of Congo, and Namibia, indicating economic growth is important for financial stability of most low income SSA countries.

Unlike the above panel ARDL estimation results, several studies show mixed relationships (positive as well as negative) between financial inclusion and financial stability. Some of the studies provide evidence that financial inclusion has a significant positive effect on financial stability (Morgan and Pontines, 2014; Neaime and Gaysse, 2018; Ahamed and Mallick, 2019; Ozili, 2020). Contrary to the above studies, there are scholars with a view that financial inclusion through credits expansion may deteriorate the quality of loan portfolios and undermine stability in cases where supervision is weak (Khan 2011; Sahay *et al.,* 2015; Cihak *et al.,* 2016). Cihák *et al.,* (2016) identified a negative relationship between financial inclusion and financial stability and argue that there is a possibility of a trade-off. Boachie, Aawaar, and Domeher (2021) argue that bank capital regulation negatively influenced banking stability in sub-Saharan African countries. It is, therefore, important for policy makers to ensure the interplay between financial inclusion and financial stability so as to minimize the problem of financial exclusion and systemic crises.

Consistent with the above two ARDL cointegration tests, examination was made on the short run and long run impacts of financial inclusion (FI) and financial stability (FS) on economic growth (LnGDPPc) using the two common estimators (PMG and MG). In this third model, similar to the

above two models, the assessment results of the two estimators indicated a slight variation. A summary of the estimation results of the model is depicted in table 18 below.

Table 19: Panel ARDL Estimations result of the three variables (LnGDPPc, FI and FS)

Variables (Dependent - LnGDPPc)	**Mean Group (MG)**	**Pooled Mean Group (PMG)**
Short Run		
ETC	-0.1258** (0.0526)	-0.187*** (0.0482)
ΔFI	-1.7481 (1.396)	-1.283 (1.338)
ΔZScore	0.0018 (0.008)	0.0024 (0.0077)
Constant	0.8677*** (0.343)	0.1435*** (0.0213)
Long Run		
FI	10.203 (7.302)	-34.505 (27.230)
ZScore	0.0042 (0.165)	0.6277 (0.4065)
Number of Obs	494	494
Number of Group	29	26
Hausman mg pmg	Prob>chi2 < 0 - Inconclusive	

Source: Author's own computations

Note: *Robust standard errors in parenthesis (***), (**), (*) indicates the level of significance at 1%, 5% and 10%, respectively.*

In line with the above two models, the findings of the third model indicated that the error correction term is significant at 5%, indicating a joint causality of the explanatory variables, i.e. financial inclusion and financial stability together have an impact on the economic growth in the long run. The coefficient of the error term shows the long run cointegration, indicating that there is going to be a long run convergence to equilibrium at a speed of 18%. In this model, where economic growth (GDP per-capita) is the dependent variable, the Hausman test result is inconclusive and did not

indicate the best fit estimator. However, the result of the two estimators is similar and it is possible to use the result either of the two estimators. Despite this fact, given the objectives of the study to assess pool rather than the individuals, the features of the pooled mean group (PMG) makes it more preferable over mean group (MG) estimator as it considers the panel mean together than the individuals, which is the intention of the research, and makes it a relatively efficient and consistent estimator for the study.

On the basis of the above result, it is possible to conclude that individual variables may not have strong influence on economic growth. However, this does not mean that financial inclusion and financial stability have no effect on the economic growth of each country. Country specific examination indicated that financial inclusion have long run effect on economic growth of countries such as Malawi, Rwanda, Gabon, Chad, and Equatorial Guinea, indicating financial inclusion is contributing to the economic growth of some of the low income SSA countries. On the other hand, financial stability has long run effect on the economic growth of countries such as Rwanda, Burundi, Nigeria, Sierra-Leone, Chad, Democratic Republic of Congo, Angola, Namibia, Mauritius, and South Africa, indicating financial stability is the concern of most middle income SSA countries in their effort to ensure economic growth.

Despite the results of the above cointegration tests, several studies showed positive and significant relationship between financial inclusion and economic growth. Makina and Wale (2019) argued that financial inclusion, proxied by the number of commercial bank branches per 100,000 people, has positive and significant contribution to the economic growth of the SSA countries. Pradhan *et al.*, (2017), Sharma (2016), and Sethi and Acharya (2018) argue that financial inclusion, proxied by access to financial services, improve per-capita income, bridge the gap in income inequality and reduce poverty. Other scholars also argue that there is a significant and positive relationship between financial inclusion and economic growth (Pradhan *et al.,* 2016; Kim *et al.,* 2018; Raza *et al.,* 2019).

On the other hand, there are several studies that show positive and significant relationship between financial stability and economic growth (Ho and Iyke, 2017; Aboura and van Roye, 2017; Sotiropoulou *et al.,* 2019; Phan *et al.,* 2020; Barra and Zotti, 2022). In line with these studies, consistent with the financial instability hypothesis of Minsky (1992), which argues that even when

times is stable, financial stability will encourage risk taking and tightening fiscal and monetary policies, leading to a fragile and unstable economy, financial instability affects the financial sector by increasing operational costs and resource misallocation, which in turn reduces economic growth. It is, thus, only stable financial system can promote economic growth and unstable financial systems undermine economic growth (Somnez and Uysal, 2018; Neaime and Gaysset, 2018; Eweke, 2019; Barra and Zotti, 2022). However, there are scholars who argue that there is a negative and significant relationship between financial stability and economic growth (Ma, 2020 and Fouejieu *et al.,* 2019). One of the arguments linked to the negative long-run relationship between financial stability and economic growth is that financial inclusion through credit expansion or real loan provisions may result in credit default, which leads to financial sector instability and thereby economic instability and weak economic growth (recession).

On the basis of the findings of the above three models, one can conclude that there is a long run cointegration across the variables of interest. In addition, it is possible to observe that there is a joint causality across all the three variables used in the panel. In the first model, financial stability and economic growth jointly and separately causes financial stability both in the short–and-long run. However, in the rest two models there is joint causality and cointegration between the variables of interest. It is, therefore, appropriate to conduct a test for Granger Causality and identify the direction of causalities.

B. Panel Granger Causality Tests

Outputs of the panel ARDL cointegration tests above ascertained that there is a long run cointegration between the variables of interest but the test did not indicate the direction of causality between the variables. In addition, cointegrating relationships do not necessarily imply causality. Since there is a long-run relationship among economic growth, financial inclusion, and financial stability, it is reasonable to expect that there must be a causal relationship in at least one direction.

Consequently Granger Causality tests were made between the three variables, FI, FS and EG, using their optimal lag lengths. One of the main purposes of this specific test is to assess whether the past values are crucial to explain the behavior of the present values. In general, results of the Granger Causality tests can take any of the following three forms. (i) Uni-directional causality that run from one variable to the other, (ii) Bi-directional Granger Causality, which imply

complementarity and moves in both directions, and (iii) Absence of causality between the variables under investigation. In order to undertake the test for the Granger Causality between the variables, the following standard dynamic panel data specification for T years and N individual subjects is adopted.

$$Y_{i.t} = \emptyset_i + \sum_{k=1}^{K} \partial_{i,k} Y_{i,t-k} + \sum_{k=1}^{K} \beta_{i,k} X_{i,t-1} + \varepsilon_{i,t} \quad \ldots\ldots (24)$$

Where: $X_{i,t}$ and $Y_{i,t}$ are observations of the two stationary variables for individual i in period t. $\partial_{i,k}$ *and* $\beta_{i.k}$ are coefficients for individual variables. K is the lag order for the variables.

In line with the results of the cointegration tests, one of the basic assumptions of the test is that there is a relationship between X and Y for at least one subset of variables in the sample. Specifically, the research adopted the models below for testing the Granger Causality between the three variables, FI, FS and EG.

$$FI_{i.t} = \emptyset_i + \sum_{k=1}^{K} \partial_{i,k} FI_{i,t-k} + \sum_{k=1}^{K} \beta_{i,k} FS_{i,t-1} + \sum_{k=1}^{K} \beta_{i,k} EG_{i,t-1} + \varepsilon_{i,t} \quad \ldots\ldots (25)$$

$$FS_{i.t} = \emptyset_i + \sum_{k=1}^{K} \partial_{i,k} FS_{i,t-k} + \sum_{k=1}^{K} \beta_{i,k} FI_{i,t-1} + \sum_{k=1}^{K} \beta_{i,k} EG_{i,t-1} + \varepsilon_{i,t} \quad \ldots\ldots (26)$$

$$EG_{i.t} = \emptyset_i + \sum_{k=1}^{K} \partial_{i,k} EG_{i,t-k} + \sum_{k=1}^{K} \beta_{i,k} FI_{i,t-1} + \sum_{k=1}^{K} \beta_{i,k} FS_{i,t-1} + \varepsilon_{i,t} \quad \ldots\ldots (27)$$

Using the above three models, the study conducted a non-Granger Causality tests on the relationship between the variables of interest, and the result of the tests show slight variations between the results of the estimators. In non-Granger Causality test, if the null hypothesis is rejected, one can conclude that there is a causality between the variables under examination. In addition, variables were interchanged to the other direction to observe the existence of a bi-directional causality. Table 19 below summarizes the findings of the Granger Causality tests.

Table 20: Granger Causality test results (LnGDPPc, FI and FS)

Variable Y	Causality Directions ←	Variable X	Juodis *et al.,* (2021) **Wald test**	Dumitrescu and Hurlin (2012) **Z-bar**
FI		ZScore	38.328***	2.121**
ZScore		FI	54.590***	7.149***
FI		LnGDPPc	40.369***	40.571***
LnGDPPc		FI	10.137***	4.798***
ZScore		LnGDPPc	10.693***	7.039***
LnGDPPc		ZScore	26.890***	12.001***
FI		ZScore and LnGDPPc	65.902***	-
ZScore		FI and LnGDPPc	82.580***	-
LnGDPPc		FI and ZScore	22.983***	-

Source: Author's own computations

Note: *Robust standard errors in parenthesis (***), (**), (*) indicates the level of significance at 1%, 5% and 10%, respectively.*

Table 19 above indicated the results of the Granger Causality test using Juodis *et al.,* (2021) and Dumitrescu and Hurlin (2012). On the basis of the two Granger Causality test estimators, there are seven causal relationships. Accordingly, bi-directional causalities were identified between financial inclusion and financial stability, financial inclusion and economic growth, and financial stability and economic growth. On the other hand, a uni-directional causality was observed under the joint causation. In all the cases, the hypothesis of no causalities between the variables was rejected at the 1% and 5% level of significance. The null hypothesis that financial stability and economic growth, financial inclusion and economic growth, and financial inclusion and financial stability do not jointly Granger-cause financial inclusion, financial stability and economic growth, respectively are rejected at the 1% level of significance.

Separate Wald test and Z-bar statistics of the Granger Causality tests and their associated probability values revealed that the null hypothesis that financial inclusion does not Granger causes financial stability, and vice versa, is rejected at the 5% level of significance, indicating a two way causality between financial stability and financial inclusion. In addition, there is a causality that

runs from financial inclusion to economic growth, and vice versa at the 5% level of significance, indicating a two way causality. In the same manner, there is causality that run from financial stability to economic growth, and vice versa at 5% level of significance, confirming bi-directional causality between financial stability and economic growth. In all the above three cases, the results indicated that there is complementarity between the three variables.

Several scholars confirmed the existence of a causality between financial inclusion and economic growth. However, the majority of the researchers advocate either supply leading (finance-growth nexus) (Schumpeter, 1912; Shaw, 1973; Levin, 2004; McKinnon, 2010) or demand following (growth-finance nexus) (Robinson, 1952; Stern, 1989; Singh, 1997; Beck *et al.*, 2000; Odhiambo, 2008; Ismail *et al.,* 2019). Samuel and Abebe (2015) argued that there is a uni-directional causality that runs from economic growth to domestic saving (financial inclusion) in the East African countries such as Ethiopia and Uganda. Unlike the above uni-directional causalities, the Granger causality test results of this study revealed that there is a bi-directional causality (feedback effect), confirming complementarity between the variables.

Consistent with the work Lewis (1955) who was the pioneer in confirming the existence of a two-way causality between financial inclusion and economic growth, and several others who suggested the existence of retroactivity, and supported the two-way assertion (Shahbaz *et al.,* 2012; Sarma, 2016; Okpara *et al.,* 2018; Nayak and Yingnan, 2019), this study found a two-way causality between financial inclusion and economic growth. Sarma (2016) specifically argues that there is a two-way causality between the various dimensions of financial inclusion and economic growth, promoting complementarity.

On the other hand, there are several scholars that promote the existence of a causality between financial inclusion and financial stability (De la Torre *et al.,* 2013; Siddik, 2018; Tran and Nguyen, 2020; Boachie, Aawaar, and Domeher, 2021). However, there is no consensus on the direction of causality. De la Torre *et al.* (2013) argued that a rise in the level of financial inclusion, coupled with weak supervision, negatively affecting stability of the financial system, especially in times of crisis. Khan (2011) also contends that banks may outsource part of their functions so as to reach the smaller entrepreneurs and households, which may harm their brand and leads to reputational risk. Tran and Nguyen (2020) as well maintain that financial development has a significant positive

impact on financial distress (Z-score), whereas it has a negative and significant effect on non-performing loans. Contrary to the above scholars, there are studies that show a positive and significant impact of financial inclusion on financial stability (Vo *et al.,* 2021; Ahmad, 2018). Stable financial system ensures efficient allocation of resources, manage financial risks and minimize the degree of price movements of real or financial assets (Ahmad, 2018). Unlike the above uni-directional causalities, the finding of this study revealed that there is bi-directional causality between financial inclusion and financial stability, indicating that there is a mutual relationship between financial inclusion and financial stability, and hence it is impossible to realise one without the other.

Boachie, Aawaar, and Domeher (2021) argued that economic growth is an important driver of banking stability and not vice versa, confirming a uni-directional causality that runs from economic growth to bank stability, supporting the demand-following hypothesis. Unlike the above research work, this study found a two-way causality between financial stability and economic growth, promoting complementarity between the variables.

In addition to the separate Granger Causality tests, this study conducted a joint Granger causality tests between the variables to ascertain the existence of joint causality. Consistent to the findings of Boachie *et al.*, (2021), who argued and supported that financial inclusion has a positive and significant influence on financial stability as well as on economic growth in the SSA countries (Boachie *et al.*, 2021), this study found that financial stability and economic growth jointly causes financial inclusion. On the other hand, financial inclusion and financial stability jointly causes economic growth as well. In addition, there is a finding that showed financial inclusion and economic growth jointly causes financial stability.

On the basis of the above findings, it is therefore possible to conclude that there are separate and joint Granger Causality between financial inclusion, FS (ZScore), and economic growth (LnGDPPc). In addition, there is a reverse causality between the stated variables: in the case of separate causality tests, indicating complementarity between the three variables, financial inclusion, financial stability and economic growth. On the other hand, the joint Granger Causality tests indicated that there is a causation that runs from financial stability and economic growth (LnGDPPc) to financial inclusion. In addition, there are causations that run from financial

inclusion and financial stability (ZScore) to economic growth, and financial inclusion and economic growth to financial stability, respectively, indicating strong causality as well as complementarity between these variables. The results of the study revealed that it is impossible to realise the objective of one without the other, as these variables of financial inclusion, financial stability and economic growth coexist and complement each other.

6.3 Diagrammatical Presentation of the Overall Analysis Results

On the basis of the analysis result in chapter six, the high level context diagram, which was developed to assess the relationship between financial inclusion, financial stability and economic growth in chapter three above, has been extended to include the specific factors that have an impact on the key variables of interest, namely financial inclusion and financial stability, which in turn have an impact on economic growth. Figure 12 below indicates the relationship between the three variables, FI, FS and EG.

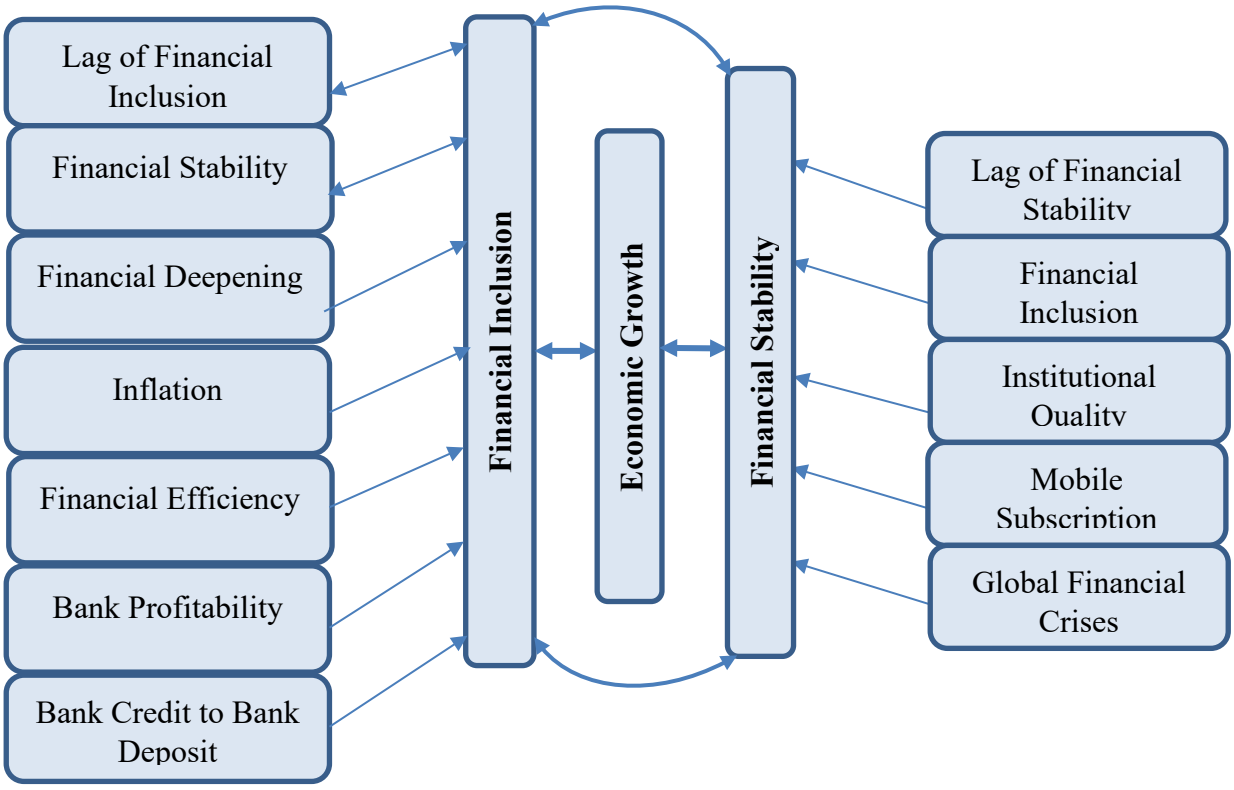

Figure 7: Relationship between financial inclusion, financial stability and economic growth.

The above diagram clearly shows that there are twelve macroeconomic and microeconomic factors that affect financial inclusion and financial stability. In addition, financial inclusion and financial stability affect economic growth and vice versa, indicating complementarity in their relationship. The high level context diagram proposed under chapter three is thus expanded and its validity is ascertained using the diagram above.

6.4 Chapter Summary and Conclusion

In this chapter, efforts were made to empirically address the research objectives. Initially, statistical analysis and description was made on the panel data. Here, the descriptive analysis was intended to verify the characteristics of the variables in the dataset. Specific descriptive analysis was undertaken on the three main variables of interest (Financial inclusion (FI), financial stability (ZScore) and economic growth (LnGDPPc)). Consequently, the study tried to develop composite indices for the two important multidimensional variables, financial inclusion and institutional quality. After the composite indexes are developed, panel unit root tests were conducted to verify stationarity of the series. Estimations were made to identify the key drivers of financial inclusion and financial stability, after which the cointegrating relationships were assessed. The last objective was to undertake granger causality tests to determine the causal relationships and direction of causality between the variables of interest.

A. Principal Component Analysis

In order to address the limitations of using individual indicators, which include a problem of partial information and misleading conclusion, and capture the multidimensional features of the indicators, the study applied a principal component analysis (PCA) to develop composite indices for financial inclusion and institutional quality of the selected SSA countries. Six individual financial inclusion indicators were selected from the three dimensions of a financial inclusion (number of bank account per 1,000 populations, indicating accessability; number of bank branches and ATMs per 100,000 populations and the number of branches and ATMs per 1000 Km^2, indicating availability, and the volume of private domestic credit to GDP, indicating usage dimensions) are used to develop a composite financial inclusion index. In the same manner, the six world governance indicators (voice and accountability, political instability and violence, government effectiveness, regulatory quality, rule of law, and control of corruption) are used to develop a composite institutional quality index.

B. Unit Root and Serial Correlation Tests

Various panel unit root tests were conducted to verify the stationarity of the variables that are used to assess the determinants of financial inclusion and financial stability. While conducting the serial correlation tests, both primary (LLC, IPS, and Bruiting) and secondary (CIDS) panel unit root tests were adopted to address the problem of both cross country independence and the possibility of a cross-country dependence. Results of the various panel unit tests indicated that the variables used in the study are stationary at level (I(0)) and first difference (I(1)). Specifically, the panel unit roots for financial inclusion (FI) and economic growth (LnGDPPc) show mixed stationarity. On the other hand, financial stability (ZScore) is stationary at level.

C. Determinants of Financial Inclusion and Financial Stability

In order to identify the major drivers of financial inclusion and financial stability, the research applied a dynamic panel GMM estimator. A composite index is used as a proxy for financial inclusion, which is then used as a dependent variable while examining the determinants of financial inclusion. In line with the result of the study, the lag of financial inclusion, economic growth, financial service expansion, bank credit to bank deposit, and profitability of banks are the major factors with positive impact on financial inclusion in the SSA countries. However, financial stability, inflation, and bank income to cost ratio have a negative and significant impact on the financial inclusion level of the SSA economies.

In the same manner, the study examined the determinants of financial stability across the selected SSA countries. In this case, financial distress (ZScore) is used as a proxy for financial stability and a dependent variable in the model. Empirical estimation results of the study revealed that the lag of financial stability and financial inclusion are the major positive driver of financial stability in the SSA countries. However, institutional quality, technology adoption and global financial crises are found to have a negative impact on the financial stability of the region.

D. Panel Cointegration and Granger Causality Tests

A panel cointegration test was made to verify the existence of a long run relationship between the key variables. In order to test the existence of long run relationship between the variables, the study applied a pane ARDL cointegration test, specifically the mean group and pooled mean group

estimations. Results of the cointegration tests indicated that there is a long run relationship between the variables of interest (financial inclusion, financial stability and economic growth). In addition, non-Granger causality tests by Juodis, *et al.,* (2021), Dumitrescu and Hurlin (2012) and Holtz-Eakin *et al.* (1988) were used to assess the various causal relationships between the variables. The results of the tests showed a two-way causal relationship between financial inclusion and financial stability, financial inclusion and economic growth, and financial stability and economic growth across the first two estimators. However, a uni-directional causality was observed while applying the var-granger causality test of Holtz-Eakin *et al.* (1988). In addition, country specific cointegration test results of the study revealed that there is variation across nations, indicating the existence of country specific factors that affect the relationship.

The results of the tests are good indications that financial inclusion and financial stability are critical for economic growth and vice versa. In line with these results, it is possible to conclude that easy access to financial products and services increase the level of output and contribute toward achieving higher economic growth in the SSA countries, which confirms that more access to financial services increases the level of intermediation and the overall stability of the formal financial sector. It is, therefore, important to enhance the level of financial service access and affordable formal financial products and services for all, including the poor and the disadvantaged members of the society, and expand credits to the private sector to encourage financial service utilisation and achieve more economic growth in the region.

The ensuing chapter provides a summary of the key findings emanating from the econometric analysis, as well as the conclusions and recommendations thereof.

CHAPTER SEVEN: CONCLUSION AND POLICY RECOMMENDATIONS

7.1 Introduction

In the previous chapters, efforts were made to document the overall picture of the financial inclusion in the SSA, identify the factors that determine financial inclusion and financial stability, and examine the causality between financial inclusion, financial stability and economic growth. Consequently, this chapter provides a summary, conclusion and recommendations of the study. It briefly discusses the rationale for the study, what the study sought to achieve, the methodology adopted, summaries of the major findings, and elucidates the contributions to knowledge. In addition, the chapter presents the main policy implications and proposed recommendations along with the possible future research areas.

7.2 Motivation and Objective of the Study

Financial inclusion often encourages the adoption and use of formal financial services and promotes cashless transactions and thereby enhances financial stability, economic growth, and help to achieve a sustainable development. Consistent with this, scholars, policymakers, and development agencies advocated the importance of promoting financial inclusion for a variety of reasons. One of the reasons is that financial inclusion plays significant roles in promoting social inclusion, particularly in previously disadvantaged communities (Makoni, 2014). It is also considered as an important instrument to realise the United Nations' Sustainable Development Goals (SDGs) (Demirgüç-Kunt and Singer, 2017). Still others cited financial inclusion as an important tool for poverty alleviation (Neaime and Gaysset, 2018). Others also argued that financial inclusion enhances the efficiency and accessibility of financial products and services at reasonable costs (Ikram and Lohdi, 2015).

In order to verify the various benefits of the financial inclusion cited above, several researches strive to examine the benefits of financial inclusion and identify its effect on financial stability and economic growth. In addition, a large number of scholars argued that there are various factors that drive financial inclusion and financial stability. Moreover, there is a strong causality between financial inclusion, financial stability and economic growth. However, consensus is lacking across the findings of the various studies on the causal relationship between financial inclusion, financial stability and economic growth, and on the direction of causality across the developing countries.

Moreover, the drivers of financial inclusion and financial stability are not consistent across regions most likely due to region and country specific features. Such inconsistency makes it difficult for policy makers, government and development agencies to draw universally accepted and standard policies and strategies that help ensure inclusive growth across the developing world.

In order to address similar challenges, scholars continued their effort to identify the key drivers of financial inclusion and stability, and identify the causality between three variables, financial inclusion, financial stability and economic growth. Consistent with the above facts, this research study endeavoured to assess the key drivers of financial inclusion and financial stability, and examines the causal relationship between financial inclusion, financial stability and economic growth in the selected SSA countries. In addition, determining the direction of causality was the other important issue this research attempted to address. In order to achieve these objectives, the study conducted short-and-long run causality tests between these variables using a panel dynamic system GMM, ARDL cointegration and non-Granger Causality tests.

7.3 Determinants of Financial Inclusion and Financial Stability

Several factors drive financial inclusion and financial stability in different parts of the world, and it is thus critical to identify and manage the key factors that drive financial inclusion and financial stability in the SSA countries. Statistical and descriptive analysis results of the study revealed that the uptake of financial services vary geographically and across income categories of the SSA region. Relatively high income economies are leading the rank in the financial inclusion index (FI), most likely because of a better investment in financial service infrastructure that may have important effects on the level of financial service access and availability. In terms of sub-region, the southern region is relatively at a high level of financial inclusion compared to the others in the adoption of formal financial services. Higher income countries such as South Africa, Namibia and Kenya have a high level of financial inclusion compared to the others in the sample.

In order to achieve the first two research objectives and address associated questions, the study examined the key determinants of financial inclusion and financial stability for the selected SSA countries. While examining the drivers of FI and FS, the dynamic panel system GMM estimation technique was applied for the models and a panel data of twenty years (2000 – 2019) were collected and used for the twenty-six SSA countries. Overall results of the study proved that there are various

macroeconomic and sector specific factors that determine the stability and inclusiveness of the financial system. Specifically, financial inclusion and financial stability are complementary to each other, and contribute to enhance economic growth and thereby promotes welfare benefits of the public.

While examining the major derivers of financial inclusion, the results of the study revealed that the lag effect of a financial inclusion, economic growth (GDPPc), financial service expansion (SFS), inflation (INF), profitability (NIM), and bank credit to bank deposit ratio (BCBD) are important factors for inclusive finance. However, financial stability (ZScore) and bank cost to income ratios (BCI) can be taken as a hindrance for the financial inclusion efforts of the region. On the basis of the above findings, it is possible to conclude that the current efforts on financial inclusion will contribute to the future inclusiveness of the financial sector. It is, therefore, necessary to monitor and manage both macroeconomic and sector related factors so as to ensure a sustainable financial inclusion and realise its socioeconomic benefits to the SSA countries.

On the other hand, while examining the determinants of financial stability, it is found that the lag of financial stability is critical for the current stability of the financial system. In addition, financial inclusion is an important positive driver of financial stability. However, the level of financial regulations (institutional quality (IQI)), expansion in digital financial technology subscription (MU) and global financial crises (GFC) have negative effects on the stability of the financial system of the SSA countries. On the basis of the above findings, it is reasonable to conclude that financial inclusion and the lag of financial stability are positive drivers of financial stability in the region. However, it is necessary to be conscious of the impact of financial regulations, while designing and implementing financial sector laws and regulations. In addition, the current efforts on financial stability will contribute to the future stability of the financial sector. It is, therefore, important to monitor possible domestic and global financial crises and act to minimize the possibility of instabilities. Table 20 below gives a summary of the key determinants of both financial inclusion and financial stability in the selected SSA economies.

Table 21: Summary of the determinants and their effects

Dependent	**Independent Variables**	**Coefficient**	**Effect and**

Variables			Significance
FI	Effect of previous period's FI (FI_{t-1})	0.9044	Positive***
	Financial Stability (Z-Score)	-0.0033	Negative***
	Economic Growth (LnGDPPc)	0.0260	Positive***
	Financial Deepening (LnSFS)	0.0663	Positive**
	Inflation (INF)	0.0005	Positive**
	Bank Cost to Income (BCI)	-0.0009	Negative**
	Net Interest Margin (NIM)	0.0105	Positive**
	Bank credit to bank deposit (BCBD)	0.0009	Positive**
Z-Score	Effect of previous period's FI ($Z\text{-}Score_{t-1}$)	0.3937	Positive***
	Financial Stability (Z-Score)	18.4573	Positive***
	Economic Growth (LnGDPPc)	-0.6109	Negative
	Institutional Quality (IQI)	-1.4096	Negative*
	Mobile subscription (MU)	-0.0381	Negative**
	Global financial crises (GFC)	-1.0312	Negative*

Note: *Robust standard errors in parenthesis (***), (**), (*) indicates the level of significance at 1%, 5% and 10%, respectively.*

7.4 Cointegration between Financial Inclusion, Financial Stability and Economic Growth

Once the major drivers of financial inclusion and stability were identified, the next effort was to examine the nature of the relationships between the key variables of interest: Financial Inclusion, Financial Stability and Economic Growth. In order to examine the long run relationships between these variables, the study used the ARDL cointegration test, while the Hausman test was used to identify the most suitable ARDL estimator. The result showed that the pooled mean group (PMG) is a more efficient and consistent cointegration test for the study. Consequently, panel cointegration tests were made for the three models and the study identified the existence of relationships between the variables, FI, FS and EG.

Overall results of the tests revealed that there is a short-and-long run cointegration between financial inclusion, financial stability and economic growth. When financial inclusion is a dependent variable, the error correction term (-0.1814) is significant at 1%. On the other hand,

economic growth has a negative and significant short run co-integration (-0.0122) with a level of significance of 5%. Both financial stability (0.043) and economic growth (0.033) have positive and significant long run cointegration with financial inclusion at 1%. However, the error term is negative and significant at 1%, indicating that there is a cointegration between these variables when financial stability or economic growth becomes a dependent variable.

7.5 Causality between Financial Inclusion, Financial Stability and Economic Growth

In reality, the cointegration tests give information on the long run relationships between the variables under investigation, and therefore, it is not logical to conclude that the results of the cointegration test always indicate the existence of a causality between the variables. In order to assess the existence of a causality between the variables under consideration, it is necessary to examine the long-run relationship between the three variables. In line with this fact, the study employed a non-Granger Causality test to check the existence of a causality, and the direction thereof, where there is a cointegration between the variables. In theory, there are three possible outcomes in the Granger Causality testing, namely uni-directional from any variables to the other(s), bi-directional which imply complementarity, and the absence of causality between the variables. Table 21 below provides a summary of the results of the Granger-causality tests of the study.

Table 22: Summary of Granger-Causality test results

Dependent Variable (Y)	Independent Variable (X)	Direction of Causality
FI	Z-Score	⟷
Z-Score	FI	⟷
FI	LnGDPPc	⟷
LnGDPPc	FI	⟷
FI	Z-Score, LnGDPPc	⟵
Z-Score	FI, LnGDPPc	⟵
LnGDPPc	FI, Z-Score	⟵

Table 21 above shows that there are seven causalities among the variables of interest. Financial inclusion, financial stability, and economic growth have bi-directional individual causalities with each other. On the other hand, there is a uni-directional causalities between a joint variables and

individual variables. On the basis of these findings, it is possible to conclude that there is strong joint variables causality between financial inclusion and financial stability, financial inclusion and economic growth, financial stability and economic growth with financial inclusion, financial stability and economic growth. While examining the direction of causality, the non-Granger Causality test results indicated that there is a two-way causality, indicating that the variables are complementary to each other.

7.6 Contribution to Knowledge

Several financial development agencies and a large number of sub-Saharan African countries have endorsed the importance of a financial inclusion strategy and intensified their campaign to ensure financial inclusion, financial stability and economic growth in the region. In addition, the sustainable development Goals (SDGs) and the AU agenda of 2063 identified financial inclusion as key enabler for many of the sustainable development. However, there is no consensus across the research findings and many of the researches show mixed results. Moreover, it is often complex to examine the key drivers of financial inclusion and financial stability, and identify their relationship with the economic growth due to their multidimensional aspects. Considering the above facts, this study has some important contributions to the existing body of literature.

One of the contributions is that the study applied a principal component analysis (PCA) to construct two important composite indices: financial inclusion (FI) and institutional quality (IQ). These indices were used while conducting the study - a better measure of FI and IQ for the developing countries. A financial inclusion index was constructed from six individual financial inclusion indicators that have been used in different earlier research works, representing accessability, availability and usage. Constructing this FI index was important to capture the broad and multidimensional aspects of financial inclusion. In addition, the study constructed a composite index for institutional quality using the six world governance indicators that has been used to examine the status of nations from institutional and regulatory perspectives. With the assistance of this index, this study attempted to capture the broad perspective of institutional quality. With both these indices, this study managed to address the problem of a partial information that might have led to a misleading conclusion that was common in the earlier research studies.

The other important contribution of the study is that it examined and confirmed the key drivers of financial inclusion and financial stability in the SSA countries. In spite of several attempts to identify the macro and micro economic determinants of financial inclusion, this study specifically showed that there are macroeconomic as well as microeconomic factors such as GDP per capita, financial stability, financial deepening, income, profitability (NIM), credit to deposit ratios and cost to income ratios (BCI) that drive for financial inclusion. These drivers are, therefore, necessary to be considered while developing policy measures to promote financial inclusion. On the other hand, financial stability is a critical element for financial inclusion and vice-versa. In addition, financial stability can also be affected by institutional quality (regulations), the level of financial technology adoption and global financial crises (dummy), suggesting the need to be conscious of these factors while developing and introducing strategies, regulations and policies to the financial sector. In this case, this study helps to justify the governments' investment decision in financial inclusion-related programs.

The other contribution of this study is that it examined the causal relationships between financial inclusion, financial stability and economic growth, and identified the existence of a bi-directional causality between financial inclusion, financial stability and economic growth, when these variables are separately treated. In line with these findings, the theories of finance nexus growth, or growth nexus finance are not sufficient by themselves and independent. Instead, the two theories should be applied together to address the issues of the region. As a result, financial inclusion is important for stability and economic growth, and financial stability is also important for financial inclusion and economic growth. In addition, economic growth is an important vehicle for financial inclusion as well as financial stability in the SSA countries, and hence there is a complementarity between the variables under discussion. A more holistic approach and strategy may therefore be necessary to enhance the financial sustainability of the region. It is, therefore, important for regulators, policy makers and government advisors of the SSA countries to consider the above facts while developing policies and strategies related to promoting financial inclusion, financial stability and economic growth.

In the recent two decades, some Sub-Saharan African countries have experienced a significant positive growth towards access to financial services. Financial sector deepening has broadened the level of financial services access, including savings, credit and payment services to households

and enterprises. Considering this fact, this study would help increase the knowledge of policy makers and strategy developers on the relevance of accessible and affordable financial services. It also raises the understanding of the financial sector operators and executives to work towards financial service expansion and ultimately improve financial inclusion in the region. In addition, the findings of this study will be useful for designing a policy on financial inclusion, financial stability, financial development and economic growth in the sub-Saharan Africa. It also help to raise the awareness of scholars, financial sector executives, policy makers, government advisors and development agencies such as the World Bank, the International Monetary Fund and the African Development Bank and use it as a reference materials on their research and intervention programmes.

In addition, the study has its own contribution in terms of methodology. It used a dynamic panel data estimation approaches and used a time series and repeated cross sectional data that form a virtual panel. With the help of this methodology, the study overcame the challenges of a lack of longitudinal data in low income countries to carry out the dynamic panel data estimation. It is appropriate to address weaknesses linked to pooled OLS analysis, which assumes that countries in repeated cross sections are independent leading to biased estimates, static fixed and random effort data analysis.

7.7 Policy Implications and Recommendations

Overall, the study revealed some interesting findings with respect to the key determinants of financial inclusion and financial stability for the selected SSA countries. It also provided evidence on the existence of a long run relationship and causality between the financial inclusion, financial stability and economic growth. On the basis of the findings, the study has a policy implication for government advisors, policy makers and regulators of the SSA countries. Accordingly, the study advises policy makers to consider the level of financial inclusion and design policies and regulation consistent with an economic growth and financial inclusion status and desirable trends. In order to achieve these targets, the policy makers and regulators should consider the recommendations below.

- ✓ Financial inclusion, financial stability and economic growth have a clear short-and-long run relationship, and hence it is necessary to deepen financial services and increase access

to the low income groups, which may not be attractive to financial institutions, and enhance the economic activities of the region, which may enhance economic activities and raise per capita income, which in turn enhance inclusion. It is, therefore, necessary to empower the masses through the expansion of investment and entrepreneurship, which would raise per capita income, thereby financial inclusion and stability, which may require human capital development.

- ✓ Financial inclusion and economic growth have a strong causality. In reality, economic growth is dependent on investment in the real sectors such as agriculture, industry and service. In case of the SSA countries, agriculture is mostly the backbone of the economy employing a larger segment of the population and hence the mainstream financial service providers should consider the social capital of the region while designing and implementing financial products and services, given its significant positive contributions to the financial inclusion through ensuring economic growth in the region.
- ✓ Financial inclusion has a significant positive effect on financial stability and economic growth, and vice versa. However, many scholars argued that domestic credit to the private sector affects financial stability. It is, therefore, necessary for policy makers to consider both aspects of the financial system while designing policies and regulations, i.e. fostering financial inclusion while ensuring the goal of greater financial stability. In this case, a holistic strategy is necessary rather than a partial approach to address the issue. In addition, policy makers and strategy developers should address constraints linked to financial inclusion such as the minimum deposit level, collateral, business track records, credit limit while improving the level of supervision so as to ensure financial stability.
- ✓ Financial inclusion through products and services expansion across the SSA improves the competitiveness of the financial market and reduces transaction costs. In this regard, policy makers and regulators should introduce policies and regulations that encourage financial products and service expansion and promote competitiveness through designing strategies linked to financial resource management. In this case, supervisory authorities should introduce prudential regulations that encourage innovations in the financial sector and ensures an easy deposit mobilization and investment process. Prudential regulations are effective to ensure financial stability, despite the fact that a large low income group of the public joined the system.

- ✓ Monetary and fiscal policies should go hand-in-hand with financial inclusion strategies and policies and address deterring factors such as excessive service charges, and enhance the penetration of financial institutions deep into the business activities where the poor is mostly engaged on. In addition, the government expenditure should target critical infrastructures with both short and long-run welfare effect of the masses as this will help reduce instability and induce access to finance, that will raise financial inclusion.
- ✓ Financial inclusion, financial stability and economic growth complement each other and hence it is important to continue creating understanding on these links across the different players and encourage financial institutions to increase their range of financial products and services at the least cost so as to ensure that the gains are spread out to the larger population. In addition, policy makers and regulators of the SSA countries should encourage the development of infrastructures such as roads, communication, electricity and housing among others, given investment in the real sector contributes to financial inclusion and overall economic development.
- ✓ Financial inclusion and financial stability are complementary policy objectives for the financial regulator. It is also found that financial inclusion and financial stability have bi-direction causality, and hence it is important to prioritize policies and regulations that foster stability while promoting inclusion.
- ✓ Per capita income is one of the determinants of financial inclusion that strengthen the demand following hypothesis and hence policies that aim at economic growth and poverty reduction should take into account the household characteristics. In this case, policy formulation should consider individual and aggregated financial products to bring about targeted interventions.
- ✓ Institutional factors play an important role in the stability of a financial system, and hence it is necessary to work to address physical, bureaucratic, and financial barriers on financial inclusion. In addition, it is necessary to introduce measures that improve the competitiveness and contestability of the financial systems through the adoption of a regulatory framework that help speed up the expansion of low cost financial products, such as subsidised small farm finance, viable idea finance, agency banking and mobile banking, and realise efficient transaction processing through public infrastructure expansion and creation of public a data center, and avoid physical barriers through the adoption of fintech

through cost sharing, and thereby financial inclusion.

7.8 Limitations and Suggestions for Future Research

In this study, efforts were made to analyse the determinants of financial inclusion and financial stability, and identify the long run relationship and direction of causality between the financial inclusion, financial stability and economic growth in the selected SSA countries. However, it is not possible to cover all aspects of the relationship in a single study. In addition, the result of the study revealed that there is variation in the level of financial inclusion. There are also several factors that affect the causality between the variables of interest. On the other hand, the study considered a pool of countries and no country level effort is made for comparison. In addition, given the limitation of data availability, the study gave focus on selected economies (26 countries), which can be expanded to accommodate other countries. Moreover, the study utilized a composite index for financial inclusion, with a possibility to expand to individual indicators of financial inclusion and compare the result. On the basis of the above facts, the study identified potential future research areas to be considered by other scholars.

Consistent with the limitation of the study, future researchers should focus on expanding the sample size and examine the causality between financial inclusion, financial stability and economic growth and undertake comparison across nations. Here, the study will help to observe the peculiarities in each country and understand the reasons for the possible variances. In addition, one of the main contributions of this study is the use a composite index than to apply individual indicators while examining the relationship. However, future researchers can expand the research and accommodate individual indicators and compare the impact of financial inclusion on financial stability and economic growth. On the other hand, financial stability is a broad concept which is arguably to use individual indicators as proxies for stability. It is, therefore, possible to construct a composite index for financial stability and check its relationships with the variables of interest in the models.

In this study, economic growth is taken in its generic form, suggesting future researchers can give priority to sectors, and study the link between the financial inclusion and specific real sector outcomes, such as agriculture, industry and service, as the aggregate figure (GDP per capita) hides a sector specific link and contribution of financial inclusion and limit the scope of the

recommendations so as to identify the extent that it helps to improve sector linked productivity. In particular, financial inclusion and its impact in improving rural livelihood in Africa would be an important area of future research.

In terms of methodology, the study used a secondary data due to the lack of primary data, and the applied dynamic panel data analysis techniques. It is, therefore, possible for future researchers to use primary data and adopt other approaches to examine the same relationship and compare the findings of study. Lack of data limited the dynamic examination of vulnerabilities for financial services access and use across the SSA countries. Efforts should continue to increase funding for research and development and guarantee high frequency data and draw forecasts and predictions at household level. In addition, the study revealed the concept of financial inclusion is broad and it has multidimensional nature, and hence it is necessary to investigate what other constraints were missing in this study to understand their impact on financial inclusion (FI).

In addition, this study identified that there is a significant positive relationship between financial inclusion and economic growth. However, earlier theories and empirical findings revealed that the relationship between financial inclusion and economic growth is non-linear and bell-shaped, indicating that there is a turning point in the effect of finance on economic growth, and hence future research that will be made on the relationship between financial inclusion and economic growth in the SSA economies can consider this fact and identify the threshold where the returns to growth fall as depth of financial inclusion increases in the SSA countries.

8. REFERENCES

Abdu, E., and Adem, M., (2021). Determinants of financial inclusion in Afar Region: Evidence from selected woredas, Cogent Economics and Finance, 9:1, 1920149. https://doi.10.1080/23322039.2021.1920149

Abdulkarim, F. M., and Ali, H. S., (2019). Financial Inclusions, Financial Stability, And Income Inequality in OIC Countries: A GMM And Quantile Regression Application. Journal of Islamic Monetary Economics and Finance, Bank Indonesia, vol. 5(2), pages 1-20. https://doi.org/10.21098/jimf.v5i2.1069

Abel, S., Mutandwa, L., & Le Roux, P. (2018). A Review of Determinants of Financial Inclusion. International Journal of Economics and Financial Issues, 8(3), 1–8. Retrieved from https://www.econjournals.com/index.php/ijefi/article/view/5458

Aboura, S., Van-Roye, B. (2017). Financial stress and economic dynamics: The case of France. International Economics, 149(1), 57-73. https://doi.10.1016/j.inteco.2016.11.001

Abusharbeh, M. T. (2017). The impact of banking sector on economic growth: Empirical analysis from Palestinian economy. International Journal of Finance and Economics, 6(2), 2306-2316. http://globalbizresearch.org/economics/journel_issues.php?journelId=38

Adalessossi, K. and Kaya, N. (2015). Measure of Financial Inclusion in the African Countries. Adv. Manage. App. Econ. 5, (23). http://www.scienpress.com/Upload/AMAE%2fVol%205_5_2.pdf

Adam, C. S, Kessy, P., Nyella, J. J., and O'Connell, S. A. (2010). The Demand for Money in Tanzania. LSE Research Online. http://eprints.lse.ac.uk/36393/

Adeola, O. and Evans, O. (2017), "Financial inclusion, financial development, and economic diversification in Nigeria", The Journal of Developing Areas, Vol. 51 No. 3, pp. 1-15. https://doi.10.1353/jda.2017.0057

Adusei, M. (2015). The impact of bank size and funding risk on bank stability, Cogent Economics and Finance, Vol. 3 No. 1, pp. 1-19. http://dx.doi.org/10.1080/23322039.2015.1111489

Africa Development Bank (2013). Financial inclusion in Africa; Retrieved from, https://www.afdb.org/fileadmin/uploads/afdb/Documents/Project-and-Operations/Financial_Inclusion_in_Africa.pdf

Aghion, P. George-Marios A., Abhijit B., and Kalina M. (2010). Volatility and growth: Credit constraints and the composition of investment. Journal of Monetary Economics 57 (3): 246–265. https://doi.org/10.1016/j.jmoneco.2010.02.005

Ahamed, M. and Mallick, S. (2019). Is financial inclusion good for bank stability? International evidence. Journal of Economic Behavior and Organization, 157. pp. 403-427. ISSN 0167-2681 http://sro.sussex.ac.uk/id/eprint/69913/

Ahmad, D. (2018). Financial inclusion and financial stability: survey of the Nigeria's financial system. International Journal of Research in Finance and Management, Vol. 1 No. 2, pp. 47-54. Available at: https://www.researchgate.net/publication/330684916

Ahulu, H., MacCarthy, J., and Muda, P., (2021). Financial Stability and Economic Growth Nexus: Evidence from Sub-Saharan Africa using Panel Data. International Journal of Economics and Financial Issues, Econjournals, vol. 11(4), pages 11-18. https://www.econjournals.com/index.php/ijefi/article/download/11407/pdf

Ajide, K.B., Raheem, D.I. and Adeniyi, O. (2015). Output Growth Volatility, Remittances and Institutions. International Journal of Development Issues Vol. 14 No. 3, 2015 pp. 190-203. https://doi.org/10.1108/IJDI-06-2015-0039

Alhassan, A. L. and Yengeni, S., (2022). Financial technology and financial inclusion in Africa. https://doi.10.21203/rs.3.rs-1794818/v1

Ali, J., and Khan, M. A. (2020). Micro and macro-financial inclusion and their impacts on economic growth: Evidence from Asian economies with alternative approaches. International Transaction Journal of Engineering, Management, and Applied Sciences and Technologies, 11(5), 1–15. https://doi.org/10.14456/ITJEMAST.2020.101

Ali, M. and Puah, C.H. (2019). The internal determinants of bank profitability and stability: An insight from banking sector of Pakistan. Management Research Review, Vol. 42 No. 1, pp. 49-67. https://doi.org/10.1108/MRR-04-2017-0103

Ali, S., and Tomoe, M., (2019). Investigation of the effects of financial regulation and supervision on bank stability: The application of CAMELS-DEA to quantile regressions. Journal of International Financial Markets, Institutions and Money, Elsevier, vol. 58(C), pages 96-116. https://doi. 10.1016/j.intfin.2018.09.006

Allen, F., Demirguc-Kunt, A., Klapper, L., and Martinez Peria, M. S. (2016). The Foundations of Financial Inclusion: Understanding Ownership and Use of Formal Accounts. Journal of Financial Intermediation, 27, 1-30. https://doi.org/10.1016/j.jfi.2015.12.003

Al Salamat, W.A., and Al-Kharouf, S., (2021). The Determinants of Financial Stability: Evidence from Jordan, International Journal of Business and Social Science Vol. 12 No. 1. https://doi:10.30845/ijbss.v12n1p5

Alsamara, M., Mrabet, Z., Jarallah, S., and Barkat, K., (2018). The switching impact of financial stability and economic growth in Qatar: Evidence from an oil-rich country. https://doi.org/10.1016/j.qref.2018.05.008

Al-Smadi, M. O., (2018). The role of financial inclusion in financial stability: lesson from Jordan. Banks and Bank Systems, 13(4), 31-39. https://doi:10.21511/bbs.13(4).2018.03

Alter A., and Yontcheva B., (2015). Financial Inclusion and Development in the CEMAC. IMF Working Paper 15/235. IMF, Washington, DC. Retrieved from: https://www.imf.org/external/pubs/ft/wp/2015/wp15235.pdf

Amali, E., Igwe, G. U., and Oballum, C. E (2022). Impact of Financial Stability on Economic Growth: Evidence from Nigeria. American International Journal of Economics and Finance Research, 5(1), 1–12. https://doi.org/10.46545/aijefr.v5i1.245

Anarfo, E. B. Abor, J. Y. Osei K. A. and Gyeke-Dako A. (2019). Monetary Policy and Financial Inclusion in Sub-Sahara Africa: A Panel VAR Approach, Journal of African Business, 20:4, 549-572. https://doi.10.1080/15228916.2019.1580998

Anarfo, E. B., Abor, J. Y., and Osei, K. A., (2020). Financial regulation and financial inclusion in Sub-Saharan Africa: Does financial stability play a moderating role? Research in International Business and Finance 51: 101070. https://doi.org/10.1016/j.ribaf.2019.101070

Anatolyevna, M. I and Ramilevna, S. L (2013). Financial stability concept: main characteristics and tools. World Applied Sciences Journal, Vol. 22, No. 6, pp. 856-858. https://dx.doi.org/10.5829/idosi.wasj.2013.22.06.609

Anderson, T. W. and Hsiao, C. (1981). Estimation of Dynamic Models with Error Components. Journal of the American Statistical Society, 76, 598-606. https://doi.org/10.1080/01621459.1981.10477691

Angela, K., Iryna B., Myroslava K. and Yuliia Z. (2022). Development of financial inclusion from the standpoint of ensuring financial stability. Public and Municipal Finance, 11(1), 20-36. https://doi.10.21511/pmf.11(1).2022.03

Anthony-Orji, O. I., Orji, A., Ogbuabor, J.E., and Nwosu, E. O., (2019). Do financial stability and institutional quality have impact on financial inclusion in developing economies? A new

evidence from Nigeria. Int. J. Sustainable Economy, Vol. 11, No. 1, pp.18–40. https://doi.10.1504/IJSE.2019.096541

Arellano, M. and Bond S., (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. Rev Econ Stud 58:277–297. https://doi.org/10.2307/2297968

Arellano, M. and Bover, O. (1995). Another Look at the Instrumental Variable Estimation of Error-Component Models. Journal of Econometrics, 68, 29-52. http://dx.doi.org/10.1016/0304-4076(94)01642-D

Arellano, M., and Bond, S. (1991). Some Tests of Specification for Panel Carlo Application to Data : Evidence and an Employment Equations. The Review of Economic Studies, 58(2), 277–297. https://pages.stern.nyu.edu/~wgreene/ Econometrics/Arellano-Bond.pdf

Arora, R. U. (2014). Access to Finance: An Empirical Analysis. European Journal of Development Research, 26, 798–814. http://dx.doi.org/10.1057/ejdr.2013.50

Ashraf, N., Karlan, D., and Yin, W. (2010b). Female empowerment: Further evidence from a commitment savings product in the Philippines. World Development, 28(3), 333–344. https://www.hbs.edu/faculty/Pages/item.aspx?num=40276

Aslan, G., Deléchat, C., Newiak, M., and Yang, F., (2017). Inequality in financial inclusion and income inequality. IMF Working Paper 17/236. Washington, DC. https://www.imf.org/en/Publications/WP/Issues/2017/11/08/Inequality-in-Financial-Inclusion-and-Income-Inequality-45344

Asongu, S., (2015). The impact of mobile phone penetration on African inequality. International Journal of Social Economics, Vol. 42 Iss 8 pp. 706 – 716. https://dx.doi.org/ 10.1108/IJSE-11-2012-0228

Asuming, P. O., Osei-Agyei, L. G., and Mohammed, J. I. (2018). Financial inclusion in sub-Saharan Africa: Recent trends and determinants. Journal of African Business 20 1 , 1–23. https://doi.org/10.1080/15228916.2018.1484209

Atellu, A.R., Muriu, P. and Sule, O. (2021). "Do bank regulations matter for financial stability? Evidence from a developing economy", Journal of Financial Regulation and Compliance, Vol. 29 No. 5, pp. 514-532. https://doi.org/10.1108/JFRC-12-2020-0114

Ayadi, R., and De Groen, W. P., (2014). Banking Business Models Monitor 2014: Europe. CEPS Paperbacks, 14 October 2014. http://aei.pitt.edu/55870/1/Banking_Business_Models_2014.pdf

Babajide, A., Adegboye, F., and Omankhanlen, A. (2015). Financial Inclusion and Economic Growth in Nigeria. International Journal of Economics and Financial Issues, 5(3), 629-637. Retrieved from https://www.econjournals.com/index.php/ijefi/article/view/1154

Babbie, Earl R. (2010). The Practice of Social Research. 12th ed. Belmont, CA: Wadsworth Cengage. Available at: https://libguides.usc.edu/writingguide/quantitative

Bagehot, W. (1873). A Description of the Money Market. Scribner, Armstrong and Company. Lombard Street: https://fraser.stlouisfed.org/files/docs/meltzer/baglom62.pdf

Balele, P. N., (2019). The Impact of Financial Inclusion on Economic Growth in Sub-Saran Africa. Journal of Applied Economics and Business, Vol. 7, No. 4, 51-68. Available at: http://www.aebjournal.org/articles/0704/070404.pdf

Baltagi, B. H., (2005). Econometric Analysis of Panel Data. (John Wiley, Chichester). https://library.wbi.ac.id/repository/27.pdf

Barra, C., Zotti, R. (2022). Financial stability and local economic development: the experience of Italian labour market areas. Empirical Economics 62, 1951–1979. https://doi.org/10.1007/s00181-021-02071-x

Batuo, M., Mlambob, K. and Asongu, S. (2018). Linkages between Financial Development, Financial Instability, Financial Liberalisation and Economic Growth in Africa. Research in International Business and Finance, 45, 168-179. https://mpra.ub.uni-muenchen.de/id/eprint/82641

Bauerle S, Thomas O, and Kindred W (2017). All Crises are Global: Capital Cycles in an Imbalanced International Political Economy. International Studies Quarterly, 61, 907-923. https://polisci.indiana.edu/research/publications/all-crises-are-global-capital-cycles-in-an-imbalanced-international-political-economy.html

Beck, T., Demirgüç-Kunt, A., and Levine, R. (2007). Finance, inequality and the poor. Journal of Economic Growth, 12(1), 27–49. https://doi.org/10.1007/s10887-007-9010-6

Beck, T., Demirgüç-Kunt, A., and Maksimovic, V. (2004). Bank Competition and Access to Finance: International Evidence. Journal of Money, Credit and Banking, 36(3), 627– 648. https://www.jstor.org/stable/3838958

Beck, T., Demirguc-Kunt, A., and Peria, M. M., (2007). Reaching out: Access to and use of banking services across countries. J. Financial Econ. 85, 234–266. https://doi.10.1016/j.jfineco.2006.07.002

Beck, T., Senbet, L., and Simbanegavi, W. (2015). Financial inclusion and innovation in Africa: An overview. Journal of African Economies, 24(suppl_1), i3-i11. https://doi.org/10.1093/jae/eju031

Bekaert, G., and Harvey, C.R., (2000). Foreign speculators and emerging equity markets. Journal of Finance 55, 565–614. https://doi.org/10.1111/0022-1082.00220

Belsley, D.A. (1991). A Guide to using the Collinearity Diagnostics. Computer Science in Economics and Management 4, 33–50. https://doi.org/10.1007/BF00426854

Benston G. J. and Smith, C. W. Jr. (1976). A Transactions Cost Approach to the Theory of Financial Intermediation. The Journal of Finance . Vol. 31, No. 2, Papers and Proceedings of the Thirty-Fourth Annual Meeting of the American Finance Association Dallas, Texas, pp. 215-231. https://doi.org/10.2307/2326596

Bhanot, D., Bapat, V., and Bera, S. (2012). Studying financial inclusion in north- east India. International Journal of Bank Marketing, 30(6), 465-484. https://doi.10.1108/02652321211262221

Blejer. M, (2006). Economic Growth and the Stability and Efficiency of the Financial Sector. Journal of Banking and Finance. 3429-3432. https://doi.10.1016/j.jbankfin.2006.06.001

Blot, C., Creel, J., Hubert, P., Labondance, F., and Saraceno, F. (2015). Assessing the Link Between Price and Financial Stability. Journal of Financial Stability, 16(0): 71–88. https://doi.org/10.1016/j.jfs.2014.12.003

Blundell, R., and Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. Journal of Econometrics, 87(1), 115–143. https://doi.org/10.1016/S0304-4076(98)00009-8

Boachie, R., Aawaar, G. and Domeher, D. (2021). Relationship between financial inclusion, banking stability and economic growth: a dynamic panel approach. Journal of Economic and Administrative Sciences. https://doi.org/10.1108/JEAS-05-2021-0084

Botev, J., Egert, B. and Jawadi, F., (2019). The Nonlinear Relationship between Economic Growth and Financial Development: Evidence from Developing, Emerging and Advanced Economies. International Economics, 160, 3-13. https://doi.10.1016/j.inteco.2019.06.004

Bourainy, M., Salah, A., and Sherif M., (2021). Assessing the Impact of Financial Inclusion on Inflation Rate in Developing Countries. Open Journal of Social Sciences, 9, 397-424. https://doi.10.4236/jss.2021.91030.

Boyd, J. H., and De Nicoló, G. (2005). The Theory of Bank Risk-Taking and Competition Revisited. The Journal of Finance, 60, 1329-1343. https://doi.org/10.1111/j.1540-6261.2005.00763.x

Bräutigam, D. A., and Knack, S. (2004). Foreign Aid, Institutions, and Governance in Sub-Saharan Africa. Economic Development and Cultural Change, 52(2), 255–285. https://doi.org/10.1086/380592

Breitung, J., and Pesaran, M. H., (2005). Unit Roots and Cointegration in Panels. IEPR Working Paper No. 05.32, CESifo Working Paper Series No. 1565, Available at SSRN: https://ssrn.com/abstract=796190 or http://dx.doi.org/10.2139/ssrn.796190

Bruce, L., Gine, X., Goldberg, J., and Yang, D. (2013). Commitments to Save: A Field Experiment in Rural Malawi. Policy Research working paper; no. WPS 5748, Impact Evaluation series; no. IE 50. World Bank. Retrieved from: https://openknowledge.worldbank.org/handle/10986/3510 License: CC BY 3.0 IGO

Bruhn, M., and Love, I. (2014). The Real Impact of Improved Access to Finance: Evidence from Mexico. The Journal of Finance, 69(3), 1347–1376. https://doi.org/10.1111 /jofi.12091

Buckland, J. (2012). Hard Choices: Financial Exclusion, Fringe Banks, and Poverty in Urban Canada, University of Toronto Press, Canada. https://doi.10.3138/9781442685291

Cámara, N. and Tuesta, D. A., (2014). Measuring Financial Inclusion: A Multidimensional Index. BBVA Research Paper No. 14/26. http://dx.doi.org/10.2139/ssrn.2634616.

Carletti E, and Hartmann P (2002) Competition and stability: what's special about banking? (ECB working paper 146). European Central Bank: Frankfurt. Retrieved from https://www.ecb.europa.eu/pub/pdf/scpwps/ecbwp146.pdf.

Cavalcante A (2018) Investment and the banking system: A Kaleckian approach for regions in Brazil. Reg Stud 52(12):1658–1671. https://doi.org/10.6084/m9.figshare.5999936.v1

Cecchetti, G., and Kharroubi, E., (2012). Reassessing the Impact of Finance on Growth. BIS Working Papers No. 381, Bank for International Settlements. https://www.bis.org/publ/work381.pdf

Chen, W., Yuan, X., and Gang, J. (2021). Financial inclusion in China: An overview. Frontiers of Business Research in China, 15(4), 1–21. https://doi.org/10.1186/s11782-021-00098-6

Chirwa, T. G., and Odhiambo, N. M. (2018). Exogenous and endogenous growth models: A critical review. Comparative Economic Research, 63–84. https://doi.org/10.2478/cer-2018-0027

Chu, L.L. (2019). Financial Structure and Economic Growth Nexus Revisited. Borsal Istanbul Review. https://doi.org/10.1016/j.bir.2019.08.003

Cihak, M., Mare, D. S. and Melecky, M. (2021). The Nexus of financial inclusion and financial stability: a study of trade-offs and synergies (English). Policy Research working paper, no. WPS 7722 Washington, D.C.: World Bank Group. http://documents.worldbank.org/curated/en/138991467994676130/The-Nexus-of-finan cial-inclusion-and-financial-stability-a-study-of-trade-offs-and-synergies

Collins, D., and Ng'weno, A. (2018). Do Financial Inclusion Efforts Really Have an Impact on Poverty? Stanford Social Innovation Review. https://doi.org/10.48558/8VZF-J280

Creel, J., Hubert, P., and Labondance, F. (2015). Financial stability and economic performance. Economic Modeling, 48, 25-40. https://doi.org/10.1016/jeconmod.2014.10.025

Cukierman, A. (2013). Monetary Policy and Institutions before, during, and after the Global Financial Crisis. Journal of Financial Stability, 9, 373-384. http://dx.doi.org/10.1016/j.jfs.2013.02.002

Dabla-Norris, E., Deng, Y., Ivanova, A., Karpowicz, I., Unsal, F., VanLeemput, E., and Wong, J., (2015) Financial inclusion: zooming in on Latin America. IMF Working Paper 15/206. Washington, DC. https://www.imf.org/external/pubs/ft/wp/2015/wp15206.pdf

Dabla-Norris, E., Ji, Y., Townsend, R. M., and Unsal, D. F. (2015). Distinguishing Constraints on Financial Inclusion and Their Impact on GDP and Inequality. NBER Working Paper, 1–63. https://www.nber.org/system/files/working_papers/w20821 /w20 821.pdf

Dahiya, S., and Kumar, M. (2020). Linkage between financial inclusion and economic growth: An empirical study of emerging Indian economy. Vision: The Journal of Business Perspective, 1–0. https://doi.org/10.1177/0972262920923891

Daniel D., Emmanuel K.Y and Godfred A. (2022). Financial innovations and economic growth: Does financial inclusion play a mediating role?, Cogent Business and Management, 9:1, 2049670. https://doi.10.1080/23311975.2022.204967

Daryl, C., and Amolo, N. (2018). Do financial inclusion efforts really have an impact on poverty?, Stanford social innovation review. https//ssir.org/articles/entry/do_financial_inclusion_efforts_impact_poverty

De Haan, J., and Sturm, J. E., (2017). Finance and income inequality: A review and new evidence. European Journal of Political Economy, 50, 171–195. https://doi.org/10.1016/j.ejpoleco.2017.04.007

De Haan, J., Pleninger, R., and Sturm, J. E., (2021). Does Financial Development Reduce the Poverty Gap? Social Indicators Research. https://doi.org/10.1007/s11205-021-02705-8

Demetriades, P., and Hussein, K., (1996). Does financial development cause economic growth? Time series evidence from 16 countries, Journal of Development Economics, 51: 387-411. https://doi.org/10.1016/S0304-3878(96)00421-X

Demetriades, P., and Law, S. H. (2006). Finance, institutions and economic development. International Journal of Finance and Economics, 11(3), 245–260. https://doi.10.1002/ijfe.296

Demirgüç-Kunt, A., and Huizinga, H., (2010). Bank activity and funding strategies: The impact on risk and returns. Journal of Financial Economics 98, 626-650. https://doi.10.1016/j.jfineco.2010.06.004

Demirgüç-kunt, A., and Levine, R. (2009). Finance and Inequality: Theory and Evidence. Annual Review of Financial Economics, 1(1), 287–318. https://doi.org/10.1146/annurev.financial.050808.114334

Demirguc-Kunt, A., Klapper, L., and Randall, D. (2014). Islamic finance and financial inclusion: measuring use of and demand for formal financial services among Muslim adults. Review of Middle East Economics and Finance, 10(2), 177-218. https://openknowledge.worldbank.org/handle/10986/16875 License: CC BY 3.0 IGO.

Demirguc-Kunt, A., Klapper, L., and Singer, D. (2017). Financial Inclusion and Inclusive Growth : A Review of Recent Empirical Evidence. Policy Research Working Paper;No. 8040. World Bank, Washington, DC. https://openknowledge.worldbank.org/handle /10986/26479 License: CC BY 3.0 IGO

Demirgüç-Kunt, A., Klapper, L., Singer, D., and Van, O.P., (2015) The Global Findex Database 2014: measuring financial inclusion around the world. Policy Research Working Paper 7255. World Bank Group, Washington, DC. Retrieved from: http://documents.worldbank.org/curated/en/187761468179367706/pdf/WPS72 55.pdf

Demirgüç-Kunt, A., Klapper, L., Singer, D., Ansar, S., and Hess, J., (2018). The Global Findex Database 2017: measuring financial inclusion and the fintech revolution. World Bank Group, Washington, DC. http://documents.worldbank.org/curated/en/332881525873182837/pdf/ 126033-PUB-PUBLIC-pubdate-4-19-2018.pdf

Desalegn, G. and Yemataw, G. (2017). Financial inclusion in Ethiopia: using LSMS (Ethiopia socioeconomic survey) data. Ethiopian Journal of Economics, 26, 31-58. https://www.ajol.info/index.php/eje/article/view/177737

Diacon, P. E., and Maha, L. G. (2015). The Relationship between Income, Consumption and GDP: A Time Series, Cross-Country Analysis. Procedia Economics and Finance, 23, 1535–1543. https://doi.org/10.1016/S2212-5671(15)00374-3

Diamond, D. W. (1984). Financial Intermediation and Delegated Monitoring. The Review of Economic Studies, 51(3), 393–414. https://doi.org/10.2307/2297430

Dienillah, A., and Anggraeni, L. (2016). DAMPAK INKLUSI KEUANGAN TERHADAP STABILITAS SISTEM KEUANGAN DI ASIA. Buletin Ekonomi Moneter Dan Perbankan, 18(4), 409-430. https://doi.org/10.21098/bemp.v18i4.574

Dilek, D., Serdar, I. M., and Yetkiner, H. (2017). Financial Development and Economic Growth: Some Theory and More Evidence. Journal of Policy Modeling, 39, 290-306. https://doi.10.1016/j.jpolmod.2016.08.001

Ditta, A. S. and Saputra, A. (2020). Financial Inclusion and Banking Performance in Indonesia. Journal of Accounting Finance and Auditing, https://doi.10.32602/ jafas.2020.010

Dumitrescu, E-I. and Hurlin, C. (2012). Testing for Granger non-causality in heterogeneous panels. Economic Modelling, Volume 29, Issue 4, Pages 1450-1460, ISSN 0264-9993. https://doi.org/10.1016/j.econmod.2012.02.014.

Dupas, P., Dean, K., Jonathan, R. and Diego, U., (2018). Banking the Unbanked? Evidence from Three Countries. American Economic Journal: Applied Economics, 10 (2): 257-97. https://doi.10.1257/app.20160597

Duprey, T., Klaus, B., and Peltonen, T. (2017). Dating Systemic Financial Stress Episodes in the EU Countries. Journal of Financial Stability, 32, 30–56. https://doi.10.1016/j.jfs.2017.07.004

Dymski, G. A. (2005b). Financial Globalization, Social Exclusion and Financial Crisis. International Review of Applied Economics, 19(4), 439–457. https://doi.org/10.1080/02692170500213319

Easterly, W.; Islam, R.; Stiglitz, J. (2000). Explaining growth volatility (English). Washington, DC: World Bank. http://documents.worldbank.org/curated/en/447071468761424497/Explaining-growth-volatility

Efobi, U., Beecroft, I., and Osabuohien, E., (2014). Access to and use of bank services in Nigeria: Micro-econometric evidence, Review of Development Finance, Volume 4, Issue 2, 2014, Pages 104-114, ISSN 1879-9337. https://doi.org/10.1016/j.rdf.2014. 05.002

Elias, S. and Worku, A. (2015), Casual Relationship between Gross Domestic Saving and Economic Growth in East Africa: Evidence from Ethiopia, Uganda and Kenya. Journal of Agriculture and Social Research, Vol. 15, No. 2. https://www.ajol.info/index.php/jasr/article/download/166717/ 156156

Elsherif, M. (2019). The relationship between financial inclusion and monetary policy transmission: the case of Egypt. In Proceedings of International Academic Conferences (No. 9010737). International Institute of Social and Economic Sciences. https://doi.10.20472/IAC.2019.045.014

European Central Bank (2012). Financial Stability Review. What is Financial Stability? Frankfurt: European Central Bank. www.ecb.int/pub/fsr/html/index.en.html

Evans, O. and Adeoye, B. (2016). Determinants of financial inclusion in Africa: a dynamic panel data approach. University of Mauritius Research Journal 22:310–336. https://doi.10.6084/M9.FIGSHARE.3409738.V2

Eze, G. P., and Markjackson, D. (2020). Determinants of financial inclusion in Nigeria. IOSR Journal of Economics and Finance, 11(1), 14–22. http://dx.doi.org/10.9790/5933-110104142

Fan, J.J., Xu, R., Su, C.W., and Shi, Q.H. (2018). Demand-following or supply-leading? Trade openness and financial development in China, Journal of International Trade and Economic Development, 27(3), 314-332. https://doi.org/10.1080/09638199.2017.1390779

Fanta, A. B. and Makina, D. (2019). The relationship between technology and financial inclusion: Cross-Sectional evidence. Extending Financial Inclusion in Africa. https://doi.10.1016/B978-0-12-814164-9.00010-4.

Feghali, K., Mora, N., and Nassif, P., (2021). Financial inclusion, bank market structure, and financial stability: International evidence. Quarterly Review of Economics and Finance 80: 236–57. https://doi.10.1016/j.qref.2021.01.007

Fouejieu, A. Popescu, A. and Villieu, P., (2019). Trade-offs between Macroeconomic and Financial Stability Objectives. Economic Modelling, 81, 621–639. http://doi.10.1016/j.econmod.2019.02.006

Fratzscher, M., Lo-Duca, M. and Straub, R. (2016). ECB Unconventional Monetary Policy: Market Impact and International Spill-overs. IMF Econ Rev 64, 36–74. https://doi.org/10.1057/imfer.2016.5

Fungacova, Z., and Weill, L., (2015). Understanding Financial Inclusion in China. China Economic Review, Vol. 34. BOFIT Discussion Paper No. 10/2014. Available at SSRN: https://ssrn.com/abstract=2428151

Galor, O. and Zeira, Z., (1993). Income Distribution and Macroeconomics. Review of Economic Studies, Oxford University Press, vol. 60(1), pages 35-52. https://doi.org/10.2307/2297811

Ganti, S., and Acharya, D., (2017). Financial Inclusion Fosters Growth: Simple Multiplier and "AK" Growth Model Analysis. Universal Journal of Accounting and Finance. Vol. 5, No. 3, pp. 55 - 59, 2017. https://doi.10.13189/ujaf.2017.050301

García, M. J. R. (2016). Can financial inclusion and financial stability go hand in hand? Economic Issues, 21(2), 81-103. Retrieved from http://www.economicissues.org.uk/Files/2016/216Garcia.pdf

Gebrehiwot, K. and Makina, D., (2015). Financial Inclusion in Africa: Evidence Using Dynamic Panel Data Analysis. http://doi.10.13140/RG.2.1.1711.7929

Gebrehiwot, K., and Makina, D. (2019). Macroeconomic Determinants of Financial Inclusion. Extending Financial Inclusion in Africa. https://doi.10.1016/B978-0-12-814164-9.00008-6

Geršl, A., and Heřmánek, J. (2006). Financial Stability Indicators: Advantages and Disadvantages of Their Use in the Assessment of the Financial System Stability. Financial Stability Report, Czech National Bank. Retrieved from: https://www.cnb.cz/export/sites/cnb/en/financial-stability/.galleries/fs_reports/fsr_2006/FSR_2006_article_2.pdf

Gertler, M., (1988). Financial Structure and Aggregate Economic Activity: an Overview. NBER Working Paper No. w2559, Available at SSRN: https://ssrn.com/abstract=341844

Ghaith N. A., Al-Own, B., and Bani-Khalid, T., (2022). Financial Inclusion Indicators Affect Profitability of Jordanian Commercial Banks: Panel Data Analysis. Economies 10: 38. https://doi.org/10.3390/economies10020038

Girma, S., and Shortland, A., (2008). The political economy of financial development. Oxford Economic Papers, Volume 60, Issue 4, October 2008, Pages 567–596. https://doi.org/10.1093/oep/gpm040

Goldsmith, R.W. (1969). Financial Structure and Development, Yale University Press: New Haven. *The Economic Journal*, Volume 80, Issue 318, 1 June 1970, Pages 365–367, https://doi.org/10.2307/2230134

Gomez, F. (2015). Failed bank takeovers and financial stability. Journal of Financial Stability, Vol. 16 pp. 45-58. https://doi.10.1016/j.jfs.2014.11.003

Górska, K. and Krzemińska, K. (2019).Determinants of Polish financial stability in 2017-2018. Central European Review of Economics and Finance. 30, 2 (Apr. 2019), 5-19. https://doi.org/10.24136/ceref.2019.004.

Gould, D. M., and Melecky, M., (2017). Risks and Returns: Managing Financial Trade-Offs for Inclusive Growth in Europe and Central Asia. Europe and Central Asia Studies, Washington DC. World Bank. https://openknowledge.worldbank.org/handle/10986/25494

Grace Abebrese, Samuel Tawiah Baidoo and Ebenezer Essiam (2020). Estimating the effects of financial inclusion on welfare in sub-Saharan Africa, Cogent Business and Management, 7:1, 1839164. https://doi.10.1080/23311975.2020.1839164

Greene, W. H. (2008). Econometric Analysis, 6th ed., Pearson Prentice Hall, Upper Saddle River. Available: https://www.worldcat.org/title/econometric-analysis/oclc/137325275

Greenwood, J and Smith, B (1997). Financial markets in development and the development of financial markets, Journal of Economic Dynamic and Control, 21: 145-181. https://doi.org/10.1016/0165-1889(95)00928-0

Guièze, J.-L. (2014). Financial inclusion in Sub-Saharan Africa. BNP Paribas Conjuncture, 13(9), 13–21. https://economic-research.bnpparibas.com/html/en-US/Financial-inclusio n -Saharan- Africa-9/25/2014,24791

Hajilee, M. and Niroomand, F., (2019). On the link between financial market inclusion and trade openness: An asymmetric analysis. Economic Analysis Policy, 62, 373–381. https://doi.org/10.1016/j.eap.2018.10.001.

Hajilee, M. and Niroomand, F., (2019). On the link between financial market inclusion and trade openness: An asymmetric analysis. Economic Analysis Policy, 62, 373–381. https://doi.org/10.1016/j.eap.2018.10.001.

Han, R., and Malecky, M. (2013). Financial Inclusion for Financial Stability: Access to Bank Deposits and the Growth of Deposits in the Global Financial Crisis. World Bank Policy Research Working Paper No. 6577. Washington, D.C.: World Bank Group. http://documents.worldbank.org/curated/en/850681468325448388/Financial-inclusion-for-financial-stability-access-to-bank-deposits-and-the-growth-of-deposits-in-the-Global-Financial-Crisis

Han, R., and Melecky, M. (2017). Broader use of saving products among people can make deposit funding of the banking system more resilient. Journal of International Financial Markets, Institutions and Money, 47, 89–102. https://doi.10.1016/j.intfin.2016.11.005

Hanif, N., and Arshed, N. (2016). Relationship between School Education and Economic Growth: SAARC Countries. International Journal of Economics and Financial Issues, 6(1), 294–300. https://www.econjournals.com/index.php/ijefi/article/view/1605

Hannig, A., and Jansen, S., (2010). Financial Inclusion and Financial Stability: Current Policy Issues. Asian Development Bank Institute, Working Paper Series No. 257. https://www.adb.org/sites/default/files/publication/156114/adbi-wp259.pdf

Harrison, P., Sussman, O., and Zeira, J., (1999) Finance and growth: Theory and new evidence, Federal Reserve Board, Finance and Economics Discussion Paper, No. 1999-35. **Error! Hyperlink reference not valid.**https://doi.10.1016/S 1574-0684(05)01012-9

Hausman, J. (1978). Specification Tests in Econometrics. Econometrica, 46, 1251-1271. https://doi.org/10.2307/1913827

Havi, E. D. K., and Enu, P. (2014). The Effect of Fiscal Policy and Monetary Policy on Ghana's Economic Growth: Which Policy Is More Potent? International Journal of Empirical Finance, 3, 61-75. https://ideas.repec.org/a/rss/jnljef/v3i2p3.html

Hellmann, T.F., Murdock, K.C. and Stiglitz, J.E. (2000). Liberalization, Moral Hazard in Banking, and Prudential Regulation: Are Capital Requirements Enough? American Economic Review, 90, 147-165. http://dx.doi.org/10.1257/aer.90.1.147

Ho, S. Y., and Iyke, B. N. (2018). Finance-Growth-Poverty Nexus: A Re-Assessment of the Trickle-Down Hypothesis in China. Economic Change and Restructuring, 51, 221-247. https://doi.10.1007/s10644-017-9203-8

Ho, S. Y., and Iyke, B. N. (2020). The Determinants of Economic Growth in Ghana: New Empirical Evidence. Global Business Review, 21, 626-644. https://doi.org/10.1177/0972150918779282

Holtz-Eakin, Newey, and Rosen, H. S. (1988). Estimating Vector Autoregression with Panel Data. Econometrica, 56(6), 1371–1395. https://doi.org/10.2307/1913103

Houben, K., Kakes, J., and Schinasi, G. (2004). Toward a framework for safeguarding financial stability. International Monetary Fund Working Paper, WP/04/101. https://www.imf.org/external/pubs/ft/wp/2004/wp04101.pdf

Hurlin, C. and Venet, B. (2001). Granger Causality Test in Panel Data Models with Fixed Coefficients. Cahier de Recherche EURISCO No. 2001-09. Université Paris IX Dauphine. https://doi.org/10.1787/888933210309

Ibrahim, M. and Alagidede, P. (2018). Nonlinearities in Financial Development–Economic Growth Nexus: Evidence from Sub-Saharan Africa. Research in International Business and Finance, 46, 95-104. https://doi.10.1016/j.ribaf.2017.11.001

Ibrahim, M. and Sare, Y. A. (2018). Determinants of financial development in Africa: How robust is the interactive effect of trade openness and human capital? Economic Analysis and Policy, Elsevier, vol. 60(C), pages 18-26. https://doi.10.1016/j.eap.2018.09.002

IMF (2016). Regional Economic Outlook: Sub-Saharan Africa Multispeed Growth. Washington, D.C: International Monetary Fund, Publication Services. http://www.pftac.org/content/dam/imf/Spring-Annual%20Meetings/AM17/Documents%20and%20Publications/Regional%20Economic%20Outlook%20Sub-Saharan%20Africa%20ENGLISH.PDF

IMF (2017). World Economic Outlook Update: A Shifting Global Economic Landscape. Washington, D. C.: International Monetary Fund. https://www.imf.org/external/pubs/ft/weo/2017/update/01/pdf/0117.pdf

Inoue, T., and Hamori, S. (2019). Financial inclusion and economic growth: Is banking breadth important for economic growth? In Financial inclusion, remittance inflows, and poverty reduction in developing countries: Evidence from empirical analyses (pp. 1–16). World Scientific Publishing. https://doi.org/10.1142/11231

Inoue, T., and Hamori, S. (2016). Financial access and economic growth: Evidence from Sub-Saharan Africa. Emerging Markets Finance and Trade, 52(3), 743–753. https://doi.org/10.1080/1540496X.2016.1116282

Ismail, E.A., Wahab, L.A.E. and Ibrahim, A.S. (2018). Measuring Financial Inclusion in Egypt. Available at: https://d1wqtxts1xzle7.cloudfront.net/58890554/Microsoft_Word_-_meas._financial_inclusion_final_.docx.pdf?

Jana K. and Venera V. (2014). Tools for assessing and forecasting financial stability of the commercial bank under conditions of instability. Investment Management and Financial Innovations, 4(11), 157-163. https://core.ac.uk/display/289435025

Johnson, S., and Williams, R. (2016). The political economy of financial inclusion: tailoring donor policy to fit. Development Policy Review, 34(5), 721–743. https://doi.org/ 10.1111/dpr.12170

Jouini, J.. (2021). Do Financial Inclusion Indicators Affect Banks' Profitability? Evidence from Selected Arab Countries. Arab Monetary Fund. Available online: https://cutt.ly/2jFdZvT

Jungo, J, Mara, M., and Anabela B., (2021). The Relationship between Financial Inclusion and Monetary Policy: A Comparative Study of Countries' in Sub-Saharan Africa and Latin America and the Caribbean. Journal of African Business, 1–22. https://doi.org/10.1080/15228916.2021.1930810

Jungo, J., Mara. M., and Anabela, B., (2022). The Effect of Financial Inclusion and Competitiveness on Financial Stability: Why Financial Regulation Matters in Developing Countries? Journal of Risk and Financial Management 15: 122. https://doi.org/10.3390/jrfm15030122

Juodis, A., Karavias, Y. and Sarafidis, V. A. (2021). Homogeneous approach to testing for Granger non-causality in heterogeneous panels. *Empir Econ* **60**, 93–112. https://doi.org/10.1007/s00181-020-01970-9

Kamal, A., Hussain, T., and Khan, M. M. S. (2021). Impact of financial inclusion and financial stability: Empirical and theoretical review. Liberal Arts and Social Sciences International Journal (LASSIJ), 5(1), 510-524. https://doi.org/10.47264/idea.lassij/5.1.33

Kapingura, F. M., Mkosana, N., and Kusairi, S., (2022). Financial sector development and macroeconomic volatility: Case of the Southern African Development Community region,

Cogent Economics and Finance, 10:1, 2038861, https://doi.10.1080/23322039.2022.2038861

Kar, M., NazlIoglu, S., and AgIr, H., (2011). Financial development and economic growth nexus in the MENA countries: Bootstrap panel granger causality analysis. Economic Modelling, Elsevier, vol. 28(1-2), pages 685-693. https://doi.org/10. 1016/j.econmod.2010.05.015

Kaufmann, D., Kraay, A., and Mastruzzi, M., (2010). The Worldwide Governance Indicators: Methodology and Analytical Issues. World Bank Policy Research Working Paper No. 5430, Available at SSRN: https://ssrn.com/abstract=1682130

Kaya, E., (2022) How does financial performance affect financial inclusion for developing countries?, Journal of Sustainable Finance and Investment. https://doi.10.1080/20430795.2022.2090310

Keeley, M. C. (1990). Deposit Insurance, Risk, and Market Power in Banking. The American Economic Review, 80(5), 1183–1200. http://www.jstor.org/stable/2006769

Kempson, E., and Whyley, C. (1999). Kept out or opted out ? Understanding and combating financial exclusion. The Policy Press. https://www.researchgate.net/publication/237456666_Kept_Out_or_Opted_Out_Understanding_and_Combating_Financial_Exclusion

Khan, H. R. (2011). Financial inclusion and financial stability: are they two sides of the same coin? Address at BANCON 2011, organized by the Indian bankers association and Indian overseas bank, Chennai 4 November 2011. https://www.bis.org/review/r111229f.pdf

Kim, D. W., Yu, J. S., and Hassan, M. K. (2017). Financial Inclusion and Economic Growth in OIC Countries. Research in International Business and Finance, 43, 1-14. https://doi.org/10.1016/j.ribaf.2017.07.178

Kim, H. (2017). The effect of consumption on economic growth in Asia. Journal of Global Economics, 05(03), 1–8. https://doi.10.4172/2375-4389.1000259

Kim, J. H. (2016). A study on the effect of financial inclusion on the relationship between income inequality and economic growth. Emerging Markets Finance and Trade, 52(2), 498-512. https://doi.org/10.1080/154049 6X.2016.111046

Kindleberger, C. P., (1978). Manias, Panics, and Crashes: A History of Financial Crises, New York: Basic Books, 3rd ed. 1996. https://doi.10.2307/203353

King, R. G., and Levine, R., (1993a). Finance and growth: Schumpeter might be right. The Quarterly Journal of Economics, 108(3), 717–737. https://doi.org/10.2307/2118406

Klaas, J., and Vagizova, V. (2014). Tools for assessing and forecasting financial stability of the commercial bank under conditions of instability. Investment Management and Financial Innovations 5(4), 157-163.

Klemkosky, R. C. (2013). Financial system fragility. Business Horizons, 56(6), 675–683. https://dx.doi.org/10.1016/j.bushor.2013.07.005

Knell, M., (2012). Schumpeter, Minsky and the financial instability hypothesis. Unpublished manuscript. http://www.aomevents.com/media/files/ISS%_202012/ISS%20SESSION%204/Knell.pdf

Kodongo O., and Ojah K., (2016). Does infrastructure really explain economic growth in Sub-Saharan Africa? Review of Development Finance, 6(2), 105-125. https://doi.org/10.1016/j.rdf.2016.12.001

Koetter, M., Kolari, J., and Spierdijk, L., (2012). Enjoying the quiet life under deregulation? Evidence from adjusted Lerner indices for U.S. Banks. Review of Economics and Statistics 94, 462–480. https://doi.org/10.1162/REST_a 00155

Kundu, D. (2015). Addressing the Demand Side Factors of Financial Inclusion', Journal of Commerce and Management Thought, 6(3), pp. 397–417. https://doi.10.5958/0976-478X.2015.00024.5

Lammermann, S. (2010). Financial Exclusion and Access to Credit, European Social Watch Report. Available at http://www.socialwatch.eu/wcm/financial_exclusion.html

Lapukeni, A. F., (2015). Financial inclusion and the impact of ICT: An overview. American Journal of Economics, 5(5), 495–500. http://doi.org/10.5923/j.economics.20150505.09

Law, S. H. and Shah H. M., (2009). The Determinant of Financial Development: Institutions, Openness, and Financial Liberalization. South African Journal of Economics, 77, 1. http://dx.doi.org/10.1111/j.1813-6982.2009.01201.x

Law, S. H., and Singh, N. (2014). Does too much finance harm economic growth? Journal of Banking and Finance, 41, 36-44. https://doi.org/10.1016/j.jbankfin.2013.12.020

Le, T. H., Chuc, A. T., and Taghi Zadeh Hesary, F. (2019). Financial inclusion and its impact on financial efficiency and sustainability: Empirical evidence from Asia. Borsa Istanbul Review. https://doi.org/10.1016/j.bir.2019.07.002

Leland H. E. and Pyle D. H., (1977). Informational Asymmetries, Financial Structure, and Financial Intermediation. The Journal of Finance , Vol. 32, No. 2, Papers and Proceedings of the Thirty-Fifth Annual Meeting of the American Finance Association, Atlantic City, New Jersey, pp. 371-387. https://doi.org/10.2307/2326770

Lenka, S. K., and Sharma, R. (2017). Does financial inclusion spur economic growth in India? The Journal of Developing Areas, 51(3), 215–228. https://doi:10.1353/jda.2017.0069

Leon F. (2015). Does banking competition alleviate credit constraint in developing countries? J. Bank Finance. https://doi.org/10.1016/j.jbankfin.2015.04.005

Lepetit, L., and Strobel, F., (2015). Bank insolvency risk and Z-score measures: A refinement," Finance Research Letters, Elsevier, vol. 13(C), pages 214-224. https://doi.10.1016/j.frl.2015.01.001

Levin A, Lin C.F, Chu C.S.J (2002). Unit root tests in panel data: asymptotic and finite-sample properties. J. Econometrics; 108 (1): 1–24. https://doi.10.1016/S0304-4076(01)00098-7

Levine R., Loayza, N. and Beck, T. (2000). Financial Intermediation and Growth: Causality and Causes. Journal of Monetary Economics, 46(1), 31-77. https://faculty.haas.berkeley.edu/ross_levine/papers/2000_JME_Fin%20Int%20Growth%20Causality.pdf

Levine, R., (2004): Finance and growth: theory and evidence. In Handbook of Economic Growth, Eds.: Aghion, P. and Durlauf, S., the Netherlands: Elsevier Science. https://doi.10.1016/S1574-0684(05)01012-9

Levine, R., and Zervos, S. (1998). Stock markets, banks, and economic growth. American Economic Review, 88, 537–558. https://www.jstor.org/stable/116848

Levine, R., Loayza, N., and Beck, T. (2000). Financial Inclusion and Growth: Causality and Causes. Journal of Monetary Economics, 46, 31-77. https://doi.org/10.1016/S03043932(00)00017-9

Levine, R., Loayza, N., and Beck, T. (2000). Financial Inclusion and Growth: Causality and Causes. Journal of Monetary Economics, 46, 31-77. https://doi.org/10.1016/S0304-3932(00)00017-9

Lewis, W.A. (1955). Theory of Economic Growth. Allen and Unwin Ltd., London. https://doi.org/10.4324/9780203709665

Leyshon, A., and Thrift, N. (1996). Financial Exclusion and the Shifting Boundaries of the Financial System. Environment and Planning A: Economy and Space, 28(7), 1150–1156. https://doi.org/10.1068/a281150

Lhuissier, S. (2017). Financial Intermediaries' Instability and Euro Area Macroeconomic Dynamics. European Economic Review, 98, 49-72. https://doi.10.1016/j.euroecorev.2017.06.004

Love, I., Soledad, M., Pería, M., Martinez-Peria, M. S., and Peria-Martinez, S. M. (2014). How Bank Competition Affects Firms' Access to Finance. The World Bank Economic Review, 29(3), 413–448. https://doi:10.1093/wber/lhu003

Lucas, R (1988). On the mechanics of economic development, Journal of Monetary Economics, 22: 3-42. https://doi.org/10.1016/0304-3932(88)90168-7

Ma, C. (2020). Financial Stability, Growth and Macro-prudential Policy. Journal of International Economics, https://doi.org/10.1016/j.jinteco.2019.103259.

Machado, C.M.D.C., Saraiva, A.F.M.G. and Vieira, P. D. D., (2021). Finance-growth nexus in sub-Saharan Africa. South African Journal of Economic and Management Sciences 24(1), a3435. https://doi.org/10.4102/ sajems.v24i1.3435

Madsen, J. B., Islam, M. R. and Doucouliagos, H. (2018). Inequality, Financial Development and Economic Growth in the OECD, 1870–2011. European Economic Review, 101, 605–624. https://doi.10.1016/j.euroecorev.2017.11.004

Makina, D., (2017). Introduction to the financial services in Africa special issue. African Journal of Economic and Management Studies, Emerald Group Publishing, Vol. 8(1), pages 2-7. https://doi.org/10.1108/AJEMS-03-2017-149

Makina, D., and Wale, Y. M. (2019). Financial inclusion and economic growth: Evidence from a panel of selected African countries. Extending Financial Inclusion in Africa, 9, 193–210. https://doi.org/10.1016/B978-0-12-814164-9.00009-8

Makoni, P.L. (2014). From financial exclusion to financial inclusion through microfinance: The case of rural Zimbabwe. Journal of Corporate Ownership and Control, 11(4), 447 – 455. https://doi.org/10.22495/cocv11i4c5p2

Mande, B., Salisu, A., Jimoh, A., Dosumu, F., and Adamu, G. (2020). Financial Stability and Economic Growth in Emerging Markets. Buletin Ekonomi Moneter Dan Perbankan, 23(2), 201-220. https://doi.org/10.21098/bemp.v23i2.1247

Manu, L.P., Adjasi, C.K.D., Abor, J. and Harvey, S.K. (2011). Financial stability and economic growth: a cross-country study. Int. J. Financial Services Management, Vol. 5, No. 2, pp.121–138. https://doi.10.1504/IJFSM.2011.041920

Matsebula, V., and Sheefeni, J. (2022). Financial Inclusion and Macroeconomic Stability in South Africa. International Journal of Economics and Financial Issues, 12(4), 56–64. https://doi.org/10.32479/ijefi.13053

McKinnon, R. (1973). Money and Capital in Economic Development. The Brookings Institution, Washington. D. C. https://doi.org/10.2307/1992568

McKinsey Global Institute (2016); Digital Finance for all: Powering Inclusive Growth in Emerging Economies. Available on: https://www.mckinsey.com/~/media/McKinsey/Featured%20Insights/Employment%20and20Growth/How%20digital%20finance%20could%20boost%20growth%20in%20emerging%20economies/MG-Digital-Finance-For -All-Full-report-September-2016.ashx

McNabb, D. E. (2008). Research Methods in Public Administration and Non-profit Management: Quantitative and Qualitative Approaches. 2nd ed. Armonk, NY: M.E. Sharpe. Available: https://libguides.usc.edu/writingguide/quantitative

Mehrotra, A., and Yetman, J. (2015). Financial inclusion issues for central banks. BIS Quarterly Review, 83-96. https://papers.ssrn.com/sol3/papers.cfm?Abstract-id=2580310

Mengistu, A., and Perez-Saiz, H., (2018). Financial Inclusion and Bank Competition in Sub-Saharan Africa. IMF Working Papers 18:1. https://www.imf.org/-/media/Files/Publications/WP/2018/wp18256.ashx.

Minsky, H. P. (1977). A Theory of Systemic Fragility. *Hyman P. Minsky Archive*. 231. https://digitalcommons.bard.edu/hm_archive/231

Minsky, H. P. (1992). The Financial Instability Hypothesis. The Jerome Levy Economics Institute, Working Paper No. 74. http://dx.doi.org/10.2139/ssrn.161024

Mishi, S., and Khumalo, S. A., (2019). Bank stability in South Africa: What matters? Banks and Bank Systems, 14(1), 122-136. http://dx.doi.org/10.21511/bbs.14(1).2019.11

Mishkin, F. S., (1991). Asymmetric Information and Financial Crises: A Historical Perspective. In: R. Glenn Hubbard, ed., Financial Markets and Financial Crises. Chicago: University of Chicago Press. 1991, 69–108. https://www.nber.org/system/files/chapters/c11483/c11483.pdf

Mollaahmetoglu, E. and Akcair, B.Y., (2019). The Missing-link between Financial Development and Economic Growth: Financial Innovation. Procedia Computer Science, 158, 696-704. https://doi.10.1016/j.procs.2019.09.105

Morgan, P., and Pontines, V. (2014). Financial Stability and Financial Inclusion. ADBI Working Paper 488. Tokyo: Asian Development Bank Institute. Available: http://www.adbi.org/working-paper/2014/07/07/6353.financial.stability.inclusion/

Mostak, M. and Sushanta, M. (2015).Is financial inclusion good for bank stability? International evidence, University of London, U.K. https://doi.org/10.1016/j.jebo.2017.07.027

Moyo, J., Nandwa, B., Oduor, J., and Simpasa, A. (2014). Financial Sector Reforms, Competition and Banking System Stability in Sub-Saharan Africa. Paper Presented at the IMF/DFID Conference on Macroeconomic Challenges Facing Low-Income Countries, IMF, Washington DC. https://www.imf.org/external/np/seminars/eng/2014/lic/pdf/Moyo.pdf

Muijs, D., (2010) Doing quantitative research in education with SPSS. 2nd edition, London, GB. SAGE Publications (In Press). https://eprints.soton.ac.uk/165853/

Murinde, V., and Eng, F.S.H. (1994). Financial development and economic growth in Singapore: demand-following or supply-leading? Applied Financial Economics, 4(6), 391-404. https://doi.org/10.1080/758518671

Musau, S., Muathe, S. and Mwangi, L., (2018). Financial inclusion, bank competitiveness and credit risk of commercial banks in Kenya. International Journal of Financial Research 9: 203–218. https://doi.10.5430/ijfr.v9n1p203

Mustafa O. Y. and Ahmet E. Y. (2017). The influence of consumption and investment on unemployment in Turkey: A SVAR approach. Ekonomika, 96(1), 74–92. https://doi.10.15388/Ekon.2017.1.10665

Naceur, S. B., and Ghazouani, S. (2007). Stock Markets, Banks, and Economic Growth: Empirical Evidence from The MENA Region. Research in International Business and Finance, 21(2), 297-315. https://doi.10.2139/ssrn.856386

Naceur, S. B., Barajas, A., and Massara, A. (2015), Can Islamic Banking Increase Financial Inclusion? (No. 15-31). International Monetary Fund. Available from: http://www.imf.org/external/np/blog/nafida/081015.pdf

Nayak, B., S., and Yingnan, Z. (2019). Critical Reflections on Different Trends in the Relationship between Financial Developments and Economic Growth in China. International Journal of Economics and Finance; Vol. 11, No.3, https://doi.org/10.5539/ijef.v11n3p89

NBE (2018). Annual Report of the National Bank Ethiopia, 2018. Retrieved from http://www.nbe.gov.et/pdf/annualbulletin/AnnualReport2017-2018/201718annualreport.pdf

Neaime, S. (2015a) 'Sustainability of Budget Deficits and Public Debts in Selected European Union Countries', Journal of Economic Asymmetries 12: 1-21. https://doi.10.1016/j.jeca.2014.10.002

Neaime, S. (2015b). 'Twin Deficits and the Sustainability of Public Debt and Exchange Rate Policies in Lebanon', Research in International Business and Finance 33: 127-43. https://doi.10.1016/j.ribaf.2014.09.004

Neaime, S. (2016) 'Financial Crises and Contagion Vulnerability of MENA Stock Markets', Emerging Markets Review 27: 14-35. https://doi.org/10.1016/j.ememar.2016.03.002

Neaime, S. and Gaysset, I. (2018). Financial Inclusion and Stability in MENA: Evidence from Poverty and Inequality. Finance Research Letters, 24, 230-237. https://doi.org/10.1016/j.frl.2017.09.007

Neaime, S. and Isabelle, G. (2017). Sustainability of Macroeconomic Policies in Selected MENA Countries: Post Financial and Debt Crises. Research in International Business and Finance 40: 129-40. https://doi.org/10.1016/j.ribaf.2017.01.001

Ngonyama, N., Mishi, S., Sibanda, K., and Makhetha-Kosi, P., (2020). Financial Depth, Bank Competition and Economic Performance: A Cross-Country Analysis. Journal of Reviews on Global Economics, 9, 423-436. https://doi.10.6000/1929-7092.2020.09.40

Nguyen, T.D., and Du, Q.L.T., (2022). The effect of financial inclusion on bank stability: Evidence from Asian, Cogent Economics and Finance, 10:1, 2040126. https://doi.10.1080/23322039.2022.2040126

Nickell, S., (1981). Biases in Dynamic Models with Fixed Effects. Econometrica Volume 49, Issue 6, 1417-1426. http://www.econ.uiuc.edu/~econ536/Papers/nickell81.pdf

Nifo A. and Vecchione G. (2014). Do institutions play a role in skilled migration? The case of Italy, Regional Studies, Volume 48, Issue 10, pp. 1628-1649. http://dx.doi.org/10.1080/00343404.2013.835799

Niyimbanira, F. (2017). Analysis of the impact of economic growth on income inequality and poverty in South Africa: the case of Mpumalanga Province. Int. J. Econ Fin Issues 7(4):254–261. https://www.econjournals.com/index.php/ijefi/article/view/4653

Nolungelo C., and Kapingura F. M., (2018). Financial Sector Liberalization and Financial Instability: Case of Selected Southern African Development Community Member Countries. Journal of Economics and Behavioral Studies, 10(6(J), 42-49. **Error! Hyperlink reference not valid.**

Noman, A.H.M., Gee C.S., and Isa C.R. (2017). Does competition improve financial stability of the banking sector in ASEAN countries? An empirical analysis. PLoS ONE 12(5): e0176546. https://doi.org/10.1371/journal.pone.0176546

Norris, E. D., Ji, Y., Townsend, R., and Unsal, D. F. (2015). Identifying Constraints to Financial Inclusion and Their Impact on GDP and Inequality: A Structural Framework for Policy. IMF Working Paper 22. IMF: Washington DC. https://www.imf.org/en/Publications/WP/Issues/2016/12/31/Identifying-Constraints-to-Financial-Inclusion-and-Their-Impact-on-GDP-and-Inequality-A-42649

Nurbekyan, A. and N. Hovanessian. (2018). Financial Inclusion, Regulation, Financial Literacy, and Financial Education in Armenia. ADBI Working Paper 843. Tokyo: Asian Development Bank Institute. Available: https://www.adb.org/publications/financial-inclusion-regulation-financial-literacy-and-financial-education-armenia

Nurbekyan, A., and Hovanessian, N., (2018). Financial Inclusion, Regulation, Financial Literacy, and Financial Education in Armenia. © Asian Development Bank Institute. http://hdl.handle.net/11540/8331.

Nxumalo, I. S., (2020). International Capital Inflows in Emerging Markets: The Role of Institutions. Masters' dissertation, University of South Africa, Pretoria, South Africa. Available online: http://hdl.handle.net/10500/26992

Nxumalo, I. S., and Makoni, P. (2021). Analysis of International Capital Inflows and Institutional Quality in Emerging Markets. Economies 9: 179. https:// doi.org/10.3390/economies9040179

Odhiambo, N.M. (2008). Financial Depth, Savings and Economic Growth in Kenya: A Dynamic Causal Linkage. Economic Modelling, Vol. 25, pages 704-713. https://doi.org/10.1016/j.econmod.2007.10.009

Oji, C. K. (2015). Promoting financial inclusion for inclusive growth in Africa: South African Institute of International Affairs. https://saiia.org.za/research/promoting-financial-inclusion-for-inclusive-growth-in-africa/

Okpara, G. C., and Onoh, A. N., Ogbonna, B. M., Iheanacho, E., and Kelechi, J. I., (2018). Econometrics Analysis of Financial Development and Economic Growth: Evidence from Nigeria. Global Journal of Management and Business Research, Vol. 18, pages 26-34. https://doi.10.11648/j.jfa.20180601.14

Olaniyi, E., Adeoye, B. (2016). Determinants of financial inclusion in Africa: A dynamic panel data approach. University of Mauritius Research Journal, 22, 310-336. https://doi.10.6084/M9.FIGSHARE.3409738.V2

Omar, M.A. and Inaba, K. (2020). Does financial inclusion reduce poverty and income inequality in developing countries? A panel data analysis. Economic Structures 9, 37. https://doi.org/10.1186/s40008-020-00214-4.

Ozili, P. K (2020). Financial Inclusion Research Around the World: A Review. Forum for Social Economics. http://dx.doi.org/10.2139/ssrn.3515515

Ozili, P.K. (2018). Banking stability determinants in Africa. International Journal of Managerial Finance, Vol. 14 No. 4, pages 462-483. https://doi.org/10.1108/IJMF-01-2018-0007

Ozili, P.K. (2019). Impact of digital finance on financial inclusion and stability. Borsa Istanbul Review, Volume 18, Issue 4, Pages 329-340. https://doi.org/10.1016/j.bir.2017.12.003

Park, C. and Mercado R.V. (2015). Financial inclusion, poverty, and income inequality in developing Asia. ADB Economics Working Paper Series 426/2015. Manila, Philippines. https://www.adb.org/sites/default/files/publication/153143/ewp-426.pdf

Park, C. and Mercado R.V. (2018). Financial inclusion: new measurement and cross-country impact assessment. ADB Economics Working Paper Series 539/2018; Manila, Philippines. https://www.adb.org/sites/default/files/publication/408621/ewp-539-financial-inclusion.pdf

Pasali, S. S (2013). Where Is the Cheese? Synthesizing a Giant Literature on Causes and Consequences of Financial Sector Development. World Bank, WPS6655. http://documents.worldbank.org/curated/en/730041468152101741/Where-is-the-cheese-synthesizing-a-giant-literature-on-causes-and-consequences-of-financial-sector-development

Patrick, H. (1966). Financial development and economic growth in underdeveloped countries. Economic development and Cultural change, 14(2), 174-189. http://dx.doi.org/10.1086/450153

Pesaran H., Smith, R. and Im, K. (1996). Dynamic Linear Models for Heterogenous Panels. The Econometrics of Panel Data. L. Matyas and P. Sevestre, editors, 145-195, Dordrecht: Kluwer Academic Publishers. https://doi.10.1007/978-94-009-0137-7_8

Pesaran, H. and Shin, Y. (1999). An Autoregressive Distributed Lag Modelling Approach to Cointegration. Econometrics and Economic Theory in the 20th Century: The Ragnar Frisch Centennial Symposium. Cambridge University Press. https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.153.3246andrep=rep1andtype=pdf

Pesaran, H. and Smith, R. (1995). Estimating Long-Run Relationships from Dynamic Heterogeneous Panels. Journal of Econometrics, 68, 79-113. https://doi.org/10.1016/0304-4076(94)01644-F

Pesaran, H., Shin, Y., and Smith, R. (1999). Pooled Mean Group Estimation of Dynamic Heterogeneous Panels. Journal of the American Statistical Association, 94, 621-634. https://doi.10.1080/01621459.1999.10474156

Pesaran, M. H. (1997). The Role of Economic Theory in Modelling the Long Run. The Economic Journal, 107(440), 178–191. http://www.jstor.org/stable/2235280

Pesaran, M. H. (2005). A Simple Panel Unit Root Test in the Presence of Cross Section Dependence, Cambridge Working Papers in Economics 0346, revised Version, University of Cambridge. https://www.econ.cam.ac.uk/research-files/repec/cam/pdf/cw pe0346.pdf

Pesaran, M. H., (2007). A Simple Panel Unit Root Test in the Presence of Cross Section Dependence. Journal of Applied Econometrics, 22, 265-312. https://doi.org/10.1002/jae.951

Pham, T.T., Dao, L.K.O. and Nguyen, V.C., (2021). The determinants of bank's stability: a system GMM panel analysis, Cogent Business and Management, 8:1, 1963390. https://doi.10.1080/23311975.2021.1963390

Phan, D. H. B., Iyke, B. N., Sharma, S. S., and Affandi, Y. (2020). Economic Policy Uncertainty and Financial Stability–Is There a Relation? Economic Modeling. https://doi.org/10.1016/j.econmod.2020.02.042.

Phan, H. T., Anwar, S. and Alexander, R. W. (2019). Competition, Efficiency and Stability: an Empirical Study of East Asian Commercial Banks. North American Journal of Economics and Finance. https://doi.org/10.1016/j.najef.2019.100990

Philipps, P.C.B and Hansen, B.E. (1990). Statistical Inference in Instrumental Variables Regression with I(1) Processes. The Review of Economic Studies, 57 (1), 99-125. https://doi.org/10.2307/2297545

Pierre, M., Grakolet, G., and Zamereith, A., (2017). Financial Inclusion and Economic Growth in WAEMU: A Multiscale Heterogeneity Panel Causality Approach. Munich Personal RePEc Archive. Available at: https://mpra.ub.uni-muenchen.de/82251/1/MPRA_paper_82251.pdf

Pigott, T., (2017). The Role of Theory in Quantitative Data Analysis. The BERA/SAGE Handbook of Educational Research, School of Education Faculty Publications and Other Works. https://ecommons.luc.edu/cgi/viewcontent.cgi?article=1142andcontext=education facpubs

Pina, G. (2018). Macro and micro-financial liberalizations, savings, and growth. Journal of Financial Economic Policy, 10(2), 290–309. https://doi.org/10.1108/JFEP-09-2017-0080

Raddatz, C., (2006). Liquidity needs and vulnerability to financial under development. Journal of Finance and Economics, 80, 677–722. https://doi.org/10.1016/j.jfineco .2005.03.012

Radulescu, M., Serbanescu, L., and Sinisi, C. L. (2019). Consumption vs. Investments for stimulating economic growth and employment in the CEE Countries – a panel analysis, Economic Research-Ekonomska Istraživanja, 32:1, 2329-2353. https://doi.10.1080/1331677X.2019.1642789

Rajhi, W., and Hassairi, S. A. (2013). Islamic Banks and Financial Stability: A Comparative Empirical Analysis Between MENA and Southeast Asian Countries. Région et Développement, 37, 1–31. https://regionetdeveloppement.univ-tln.fr/wp-content/uploads/7_Rajhi.pdf

Ranciere, R., Tornell, A., and Westermann, F. (2008). Systemic Crises and Growth. Quarterly Journal of Economics, 123(1), 359–406. https://doi.org/10.1162/qjec. 2008.123.1.359

Ranjbar, O. and Rassekh, F. (2017). The Impact of Financial Development on Income Convergence: an Application of Two Exogenous Growth Models. International Review of Economics and Finance, 50, 65-74. https://doi.10.1016/j.iref.2017.03.028

Ricardo, G., (2015). What Financial Regulation for Stability and Financial Inclusion in Africa? The Views of Regulators of Ethiopia, Kenya and Lesotho; Working Paper 414; March 2015. https://cdn.odi.org/media/documents/9590.pdf

Richard C. R., Craig L. B., Jarol B. M., and Lars W., (2018). Empirical Political Analysis: Quantitative and Qualitative Research Methods. 9th ed. Boston, MA: https://doi.org/10.4324/ 9781315109664.

Robinson, J. (1952). The rate of interest and other essays. MacMillan, London. https://doi.org/10.2307/2226559

Rojas-Suarez L, and Amado M.A. (2014) Understanding Latin America's Financial Inclusion Gap. Center for Global Development Working Paper 367. Washington, DC. **Error! Hyperlink reference not valid.**

Romer, P. (1986). Increasing returns and long-run growth. Journal of Political Economy, 94(5), 1002-1037. https://doi.org/10.1086/261420

Romer, P. (1990). Endogenous technological change. Journal of Political Economy, 98(5), Part 2, S71-S102. https://doi.org/10.1086/261725

Sahay, R., Cihak, M., Barajas, A. and Gao, Y., (2015). Rethinking Financial Deepening: Stability and Growth in Emerging Markets. IMF Staff Discussion Notes 15/08, International Monetary Fund. https://www.imf.org/external/pubs/ft/sdn/2015/sdn1508.pdf

Sahay, R., Čihák, M., N'Diaye, P.M, Barajas, A., Mitra, S., Kyobe, A. Mooi, Y.N., and Yousefi, S. R., (2015). Financial Inclusion: Can It Meet Multiple Macroeconomic Goals? IMF Staff discussion note. https://www.imf.org/en/Publications/Staff-Discussion-Notes/Issues/2016/12/31/Financial-Inclusion-Can-it-Meet-Multiple-Macroeconomic-Goals-43163

Sanogo, V. and Moussa, R.K. (2017). Financial Reforms, Financial Development, and Economic Growth in the Ivory Coast. Economies Vol. 5, no. 1, pp.1-23. https://doi.org/10.3390/economies5010007

Saraswati, B. D., Maski, G., Kaluge, D., and Sakti, R. K. (2020). The effect of financial inclusion and financial technology on effectiveness of the Indonesian monetary policy. Business: Theory and Practice, 21(1), 230-243. https://doi.org/10.3846/btp.2020.10396

Sarma, M. (2008). Index of financial inclusion: Indian Council for Research on International Economics Relations. http://icrier.org/pdf/Working_Paper_215.pdf

Sarma, M. and Pais, J. (2008). Financial inclusion and development: a cross country analysis. Indian council for research on international economic relations. https://icrier.org/pdf/Mandira%20Sarma-Paper.pdf

Sarma, M., (2012). Index of financial inclusion - A measure of financial sector inclusiveness. Berlin Working Papers on Money, Finance, Trade and Development, 07/2012. https://finance-and-trade.htw-berlin.de/fileadmin/HTW/Forschung/Money_Finance_Trade_Development/working_paper_series/wp_07_2012_Sarma_Index-of-Financial-Inclusion.pdf

Sarma, M., and Pais, J. (2011). Financial Inclusion and Development. Journal of International Development, 23(5), 613–628. https://doi.org/10.1002/jid.1698

Scheneider, F., Buenhn, A., and Motenegro, E.C. (2010). Shadow economies all over the world: New economies for 162 countries from 1999 to 2007. Policy research working paper, 53-56. WPS 5356 Washington, D.C.: World Bank Group. http://documents.worldbank.org/curated/en/311991468037132740/Shadow-economies-all-over-the-world-new-estimates-for-162-countries-from-1999-to-2007

Schilirò, D. (2017). A glance at Solow's growth theory. Journal of Mathematical Economics and Finance, 3(2), 83-103. https://doi.org/10.14505//jmef.v3.1(4).04

Schinasi, G. J., (2004). Defining Financial Stability. IMF Working Paper No. 04/187, Available at SSRN: https://ssrn.com/abstract=879012

Schumpeter J. A. (1911). The Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest and the Business Cycle. Harvard University Press, Cambridge. https://doi.org/10.4324/9781315135564

Schwartz, A. J., (1986). Real and Pseudo-Financial Crises. in Forrest Capie and Geoffrey E. Wood, eds., Financial Crises and the World Banking System, Basingstoke, Macmillan, 1986, pp. 11–31. https://www.nber.org/system/files/chapters/c7506/c7506.pdf

Sethi, D., and Acharya, D. (2018). Financial inclusion and economic growth linkage: Some cross country evidence. Journal of Financial Economic Policy, 10(3), 369–385. https://doi.org/10.1108/JFEP-11-2016-0073

Shabir, M., Jiang, P., Bakhsh, S., and Zhao, Z. (2021). Economic policy uncertainty and bank stability: threshold effect of institutional quality and competition. *Pac. Basin Financ. J.* 68:101610. https://doi.10.1016/J.PACFIN.2021.101610

Shahbaz, M., Shahbaz S. M. and Sabihuddin B. M. (2013). Effect of financial development on agricultural growth in Pakistan: New extensions from bounds test to level relationships and Granger causality tests. *International Journal of Social Economics*, Vol. 40 No. 8, pp. 707-728. https://doi.org/10.1108/IJSE-01-2012-0002

Sharma, D. (2016). Nexus between financial inclusion and economic growth: Evidence from the emerging Indian economy. Journal of Financial Economic Policy, 8(1), 13–36. https://doi.org/10.1108/JFEP-01-2015-0004

Shaw, E.S. (1973). Financial Deepening in Economic Development. Oxford University Press, New York. https://doi.org/10.1016/0304-3878(74)90024-8

Shihadeh, F. and Liu. B. (2019). Does Financial Inclusion Influence the Banks Risk and Performance? Evidence from Global Prospects. Academy of Accounting and Financial Studies Journal 23: 1–12. https://scholar.ptuk.edu.ps/bitstream/123456789/703/1/Does-Financial-Inclusion-Influence-the-Banks-Risk-and-Performance-1528-2635-23-3-403.pdf

Shihadeh, F.H., Hannon, A.(.T.)., Guan, J., Haq, I.u. and Wang, X. (2018). Does Financial Inclusion Improve the Banks' Performance? Evidence from Jordan. Kensinger, J.W. (Ed.) *Global Tensions in Financial Markets* (*Research in Finance, Vol. 34*), Emerald Publishing Limited, Bingley, pp. 117-138. https://doi.org/10.1108/S0196-382120170000034005

Siddik, M. N., Sun, G., and Kabiraj, S., (2015). Financial inclusion and its determinants: a study of Bangladesh. Indian Journal of Finance, Vol. 9, No. 6, pp.7-29. https://doi.org/10.17010/ijf/2015/v9i6/70988

Siddik, M., Alam, N., and Kabiraj, S. (2018). Does Financial Inclusion Induce Financial Stability? Evidence from Cross-Country Analysis; Australasian Accounting, Business and Finance Journal, 12(1), 34-46. http://dx.doi.org/10.14453/aabfj.v12i1.3

Simatele, M. C. (ed.), (2021). Financial inclusion: Basic theories and empirical evidence from African countries, pp. i–285, AOSIS, Cape Town. https://doi.org/10.4102/aosis.2021.BK255

Simatele, M., and Maciko, L., (2022). Financial Inclusion in Rural South Africa: A Qualitative Approach. Journal of Risk and Financial Management 15: 376. https://doi.org/10.3390/jrfm15090376

Simatele, M., and Mbedzi E., (2021). Consumer payment choices, costs, and risks: Evidence from Zimbabwe, Cogent Economics and Finance, 9:1, 1875564, https://doi.10.1080/23322039.2021.1875564

Simmons, K. (2015). Sub-Saharan Africa makes progress against poverty but has long way to go; Pew Research Center. Retrieved from http://www.pewresearch.org/fact-tank/2015/09/24/sub-saharan-africa-makes-progress-against-poverty-but-has-long-way-to-go/

Sobiech, I., (2019). "Remittances, finance and growth: Does financial development foster the impact of remittances on economic growth?," World Development, Elsevier, vol. 113(C), pages 44-59. https://doi.10.1016/j.worlddev.2018.08.016

Solow, R. (1956). A contribution to the theory of economic growth. The Quarterly Journal of Economics, 70(1), 65-94. https://doi.org/10.2307/1884513

Somoye, R. O. C., (2013). The Impact of Finance on Entrepreneurship Growth in Nigeria: A Cointegration Framework. ACRN Journal of Entrepreneurship Perspectives. Vol. 2, Issue 2, p. 21-45. http://www.acrn.eu/resources/Journals/201310b.pdf

Sonmez, E., and Uysal, D. (2018). The impact of financial instability on economic growth on BRICT countries. Business and Economics Research Journal, 9(1), 25-48. https://10.20409/berj.2018.92

Sotiropoulou, T., Giakoumatos, S.G., and Petropoulos, D. P. (2019). Financial development, financial stability and economic growth in European Union: a panel data approach. Advances in Management and Applied Economics, SCIENPRESS Ltd, vol. 9(3), pages 1-4. https://www.scienpress.com/Upload/AMAE/Vol%209_3_4.pdf

Sourafel, G., and Anja, S. L., (2008). The political economy of financial development. Oxford Economic Papers, Volume 60, Issue 4, Pages 567–596. https://doi.org/10.1093/oep/gpm040

Stern, N., (1989). The economics of development: a survey, Economic Journal, 99: 597-685. https://doi.org /10.2307/2233764 or https://personal.lse.ac.uk/sternn/048NHS.pdf

Stiglitz, J. and Weiss, A. (1981). Credit Rationing in Markets with Imperfect Information. The American Economic Review, 71, 393-410. https://www.jstor.org/stable/1802787

Stijn, C., Liliana, R., and Suarez, C., (2016). Financial Regulations for Improving Financial Inclusion (Brief). Centre for Global Development. https://www.cgdev.org/sites/default/files/financial-access-task-force-brief_0.pdf

Temesgen, F., Wondafarahu, M., and Badassa, W. C., (2022). Determinants of Financial Instability in Selected East and Southern African Countries, International Journal of Economics, Finance and Management Sciences. Volume 10, Issue 2, pp. 37-44. https://doi: 10.11648/j.ijefm.20221002.11

The Global Findex Database (2017). Retrieved from: http://www.worldbank.org/en/programs /globalfindex, Retrieved on September 10, 2020.

Tissot, B. and Gadanecz, B. (2017). Measures of financial inclusion – a central bank perspective (Rep.). Retrieved from https://www.bis.org/ifc/publ/ifcb47q_rh.pdf.

Torabi, R., Eshraghi, M., and Nagheli, E. (2017). Financial stability and economic performance in OPEC countries: An approach to co-integration methods. International Journal of Management, Accounting and Economics, 4(1), 56-65. https://www.ijmae.com/article_114924.html

Tosunoglu, T. B. (2018). Relationship between Financial Stability and Economic Growth in Turkey (2002-2017). Proceedings of International Academic Conferences 6409266, International Institute of Social and Economic Sciences. https://doi.10.20472/IAC.2018.935.049

Tran, S. H., and Nguyen, l. T., (2020). Financial Development, Business Cycle and Bank Risk in Southeast Asian Countries. The Journal of Asian Finance, Economics and Business 7: 127–35. https://doi.org/10.13106/jafeb.2020.vol7.no3.127.

Tuesta, D., Sorensen, G., Haring, A., and Cámara, N., (2015). Financial inclusion and its determinants: the case of Argentina. BBVA Research Working Paper 15/03. Madrid, Spain. https://www.bbvaresearch.com/wp-content/uploads/2015/01/WP_15-03_Financial-Inclusion-in-Argentina.pdf

Tymoigne, E., (2006). The Minskian system, Part I. Levy Economics Institute of Bard College, working paper No. 452. https://doi.10.2753/0577-5132500406

Umar, M., and Akhtar, M., (2021). Financial inclusion and bank risk-taking nexus: evidence from China. China Finance Review International. https://doi.org/10.1108/CFRI-08-2021-0174

UN 2030 agenda for Sustainable Development (2015): **Error! Hyperlink reference not valid.**

UNSGSA Annual Report (2016). Financial Inclusion: Advancing Sustainable Developments: Annual Report to the Secretary-General, September 2016. New York, NY: United Nations. Retrieved from: https://www.unsgsa.org/files/6214/7708/0597/UNSGSA_report_2016_copy.pdf

Valickova, P., Havranek, T., and Horvath, R. (2015). Financial Development and Economic Growth: A Meta-Analysis. Journal of Economic Surveys, 29(3), 506-526. https://doi.org/10.1111/joes.12068

Van, L.T.H., Vo, A.T.N., Nguyen, N.T., and Vo, D.H., (2021a). Financial inclusion and economic growth: An international evidence. Emerging Markets Finance and Trade 57: 239–63. https://doi.org/10.1080/1540496X.2019.1697672

Van, L.T.H., Vo, A.T.N., Nguyen, N.T., and Vo, D.H., (2021b). Financial inclusion and stability in the Asian region using bank-level data. Borsa Istanbul Review 21: 36–43. http://doi: 10.1016/j.bir.2020.06.003

Vidya, C. T. and Prabheesh, K. P. (2020). Implications of Covid-19 Pandemic on The Global Trade Networks, Emerging Markets Finance and Trade, 56, 2408-2421. https://doi.org/10.1080/1540496X.2020.1785426

Vo, D. H., Nguyen, N. T., and Van, L. T (2021). Financial inclusion and stability in the Asian region using bank-level data. Borsa Istanbul Review, 21(1), 36–43. https://doi.org/10.1016/j.bir.2020.06.003

Vo, H. D., Nguyen, V. M., Le, P. Q., and Pham, T. N. (2019). The determinants of financial instability in emerging countries. Annals of Financial Economics, 14(2), 1-9. https://doi.10.1142/S2010495219500106

Wale, L.E. and Makina, D. (2017), "Account ownership and use of financial services among individuals: Evidence from selected Sub-Saharan African economies", African Journal of Economic and Management Studies, Vol. 8 No. 1, pp. 19-35. https://doi.org/10.1108/AJEMS-03-2017-146

Wang, S., Chen, L., and Xiong, X. (2019). Assets bubbles, banking stability and economic growth. Economic modelling, Elsevier, 78(C), 108-117. https://doi.10.1016/j.econmod. 2018.08.014

Wooldridge, J. M., (2012). Introductory econometrics: a modern approach. Mason, Ohio: South-Western Cengage Learning. https://123docz.net/document/7968634-jeffrey-m-wooldridge-introductory-econometrics-a-modern-approach-south-western-college-pub-2012.htm

World Bank (2016). Poverty and shared prosperity: taking on inequality. World Bank Group, Washington, DC. https://openknowledge.worldbank.org/bitstream/handle/10986 /25078/ 9781464 809583.pdf

World Bank (2020). Poverty and Shared Prosperity 2020; Reversals of Fortune. **Error! Hyperlink reference not valid.**

World Bank Development Indicator (2021). https://data.worldbank.org/indicator/NY.GDP.PCAP.CD?locations=ZG

World Bank, (2017). Financial Inclusion. Retrieved from https://www.worldbank.org/en/topic/financialinclusion/overview.

Wyk, B. F., and Kapingura, F., M., (2021). Understanding the nexus between savings and economic growth: A South African context. Development Southern Africa. 38 (5): 828-844. https://doi.org/10.1080/0376835X.2021.1932424

Xue, W. (2020). Financial Sector Development and Growth Volatility: An International Study. International Review of Economics and Finance. https://doi.org/10.1016/j.iref.2020.06.025

Yadav, M., Sahu, T. N., and Maity, S. (2022). Financial inclusion and bank efficiency: Evidence from data envelopment analysis. Colombo Business Journal, 13(1), 141-169. DOI: http://doi.org/10.4038/cbj.v13i1.92

Yazidu U. and Ashenafi B. F. (2021). Financial development and economic growth in sub-Saharan Africa: A sectoral perspective, Cogent Economics and Finance, 9:1, 1934976, https://doi.10.1080/23322039.2021.1934976

Yorulmaz, R. (2016). Construction of a Financial Inclusion Index for the Member and Candidate Countries of the European Union. Sayıştay Dergisi, No.102. https://dergipark.org.tr/tr/pub/sayistay/issue/61558/919205

Younsi, M., and Nafla, A. (2019). Financial stability, monetary policy and economic growth: Panel data evidence from developed and developing countries. Journal of Knowledge Economy, 10(1), 238-260. https://doi.org/10.1007/s13132-017-0453-5

Zhang, R. and Naceur, S., (2019). Financial development, inequality, and poverty: Some international evidence. International Review of Economics and Finance, Elsevier, vol. 61(C), pages 1-16. https://doi.10.1016/j.iref.2018.12.015

Zhu, X., Asimakopoulos, S. and Kim, J. (2020). Financial Development and Innovation-Led Growth: Is Too Much Finance Better? Journal of International Money and Finance, 100, 1-24. https://doi.10.1016/j.jimonfin.2019.102083

Zins, A., and Weill, L. (2016). The determinants of financial inclusion in Africa. Review of Development Finance, 6(1), 46-57. https://doi.org/10.1016/j. rdf.2016.05.001

Ziramba, E., (2008). The demand for residential electricity in South Africa. Energy Policy, Elsevier, vol. 36(9), pages 3460-3466. https://doi.org/10.1016/j.enpol.2008.05.026