

UNIVERSITY OF GHANA

COLLEGE OF HUMANITIES

**FINANCIAL INCLUSION, FINANCIAL LITERACY AND INCLUSIVE GROWTH IN
AFRICA**

BY

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**THIS THESIS IS SUBMITTED TO THE UNIVERSITY OF GHANA, LEGON IN
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DECLARATION

I declare that with the exception of references made to the work of other researchers which I have duly acknowledged, this thesis is my own work produced from research under supervision. This thesis has not been presented to any other academic institution for any academic award. I am solely responsible for any lapses in this thesis.

Eunice Stella Nyarko

Date

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CERTIFICATION

I hereby certify that this work was done and supervised in accordance with laid down regulations of the University of Ghana.

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ABSTRACT

The aim of this study is to investigate the nexus between financial inclusion, financial literacy and inclusive growth in Africa. The study uses a modified version of Sarma (2008) approach to compute an index of financial inclusion and inclusive growth. The system-generalized methods of moments is employed to analyze the link between financial inclusion and inclusive growth. Ordinary Least Squares with robust standard errors is employed to investigate the link between financial literacy and inclusive growth. Lastly, the causal step and bootstrap approaches are used to investigate how financial institutions mediate between financial literacy and financial inclusion. The study finds that the extent of financial inclusion remains low relative to indices that have been computed using earlier data. Also, the level of inclusive growth is low in Africa. In addition, the access dimension of financial inclusion has a significant positive impact on the participation dimension of inclusive growth. Financial access is inversely related to poverty although not statistically significant. Further, the usage dimension shows a positive but insignificant impact on both the participation and benefit dimensions of inclusive growth. It also finds that financial literacy has a positive and statistically significant impact on participation dimension of inclusive growth. Finally, commercial banks and other financial institutions mediate between financial literacy and one or more of the financial inclusion indicators of account ownership, savings and bank credit. To conclude, this study provides evidence that for inclusive growth to be scaled up in Africa, financial inclusion needs to be expanded. One way to do this is to embark on deliberate financial literacy programme. Low inclusive growth in Africa gives indication that there is low participation of the working population in the growth process and this weakens the base of economic activities that spurs growth. Nonetheless, there is an opportunity to harness the role of other financial institutions to improve financial inclusion through a deliberate financial literacy

plan. Low level of financial inclusion and inclusive growth is a threat to the fight of poverty and inequality in Africa.

The policy recommendations of this research are: firstly, policy makers need to consider developing, implementing and continuously reviewing a national financial inclusion plan in each of the countries in Africa in order to improve financial inclusion. Also, there is the need for policies that focus on expansion of economic opportunities and provision of access to productive resources that targets both the formal and informal sectors of the economy. Further, policy makers should sensitize non-bank financial institutions to actively embark on financial literacy initiatives. Lastly, the scope of financial inclusion needs to be broadened to include the activities of non-bank financial institutions in the fields of practice and academia. This research contributes to practice and literature by expanding the indicators used to compute financial inclusion index to include remittances and withdrawals. It also offers an alternative approach of computing an inclusive growth index. Further, it adds to the scanty literature on empirical analysis of the link between financial inclusion and inclusive growth. It also adds to the literature on mediation analysis by combining both the causal step and the bootstrap approaches to examine the mediating role of financial institutions on financial literacy and financial inclusion. This approach can be extended to study other relationships in order to provide a more insightful exposition. Finally, it makes a case for the need to broaden the scope of financial inclusion to include the activities of other non-bank financial institutions because they are channels for financial inclusion.

DEDICATION

I offer this thesis to my family particularly my late mother Mrs. Mary Teiko Nyarko (Nee Nadutey). I appreciate all the investment she has made in me and for how she spurred me to come this far. God knows best why He called her to eternity just a semester away from the end of my programme. Rest in perfect peace, Mama.

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LIST OF ABBREVIATIONS

Abbreviations	Explanation
ADB	Asian Development Bank
AfDB	African Development Bank
ATM	Automated Teller Machine
CGAP	Consultative Group to Assist the Poor
CV	Coefficient of Variation
DFID	Department for International Development
DWP	Department for Work and Pensions
ETPR	Employment to population ratio
FDIC	Federal Deposit Insurance Corporation
FLEC	Financial Literacy and Education Commission
GDI	Gender Development Index
GDP	Gross Domestic Product
GMM	Generalized Method of Moments
HDI	Human Development Index
HPI	Human Poverty Index
HRV	Hausmann, Rodrik, Velasco
IBRD	International Bank for Reconstruction and Development
ICT	Information and Communication Technology
IFI	Index of Financial Inclusion
IFPRI	International Food Policy Research Institute
IGI	Inclusive Growth Index
ILO	International Labour Organization
IMF	International Monetary Fund
INFE	Integrated Non-Formal Education
LICs	Low Income Countries

MFI	Micro-Finance Institutions
MPI	Multidimensional Poverty Index
OECD	Organization for Economic Co-operation and Development
OLS	Ordinary Least Squares
PISA	Programme for International Student Assessment
PPP	Purchasing Power Parity
S & P	Standard and Poor
SDGs	Sustainable Development Goals (SDGs)
SMEs	Small and Medium Scale Enterprises
SOF	Social Opportunity Function
UK	United Kingdom
UN	United Nations
UNDP	United Nations Development Programme
UNICEF	United Nations Children's Fund
UPU	Universal Postal Union
US	United States
USAID	United States Agency for International Development
WB	World Bank
WDI	World Development Indicators

CHAPTER ONE

INTRODUCTION

1.1 Background

Financial inclusion has come to be one of the preeminence on the schema of many economies because of its potential to reduce poverty, promote sustained economic growth and enhance the achievement of inclusive growth. The concept relates to access to financial services such as credit, savings, remittances, money transfer, insurance, mortgages and pensions; and use of financial products that meet the needs of users. Financial inclusion enables households to save, invest and get access to credit to support their upkeep and to undertake productive economic activities that improve their standard of life. It also broadens the customer base of financial institutions and promotes efficient financial system at the economy level.

In spite of the roles that financial inclusion plays a number of adults (aged 15+) are involuntarily not included in the financial system in Africa. Allen, Demirguc-Kunt, Klapper, and Peria (2016) and Fungacova and Weill (2015) argue that some of the reasons for this exclusion are long distance to access financial services, high cost and documentation requirements. Sarma and Pais (2011) add that one of the structural causes of limited financial inclusion in Africa is due to low income levels. According to World Bank (2017) while more than two-thirds of the adults worldwide have access to banking and mobile accounts, about 1.7 billion adults remain unbanked. In addition, more than 73% of the poor are unbanked yet the poor may have greater need for financial services.

Though financial inclusion in Africa has improved in recent times, relative to other regions it is still a challenge.

A related challenge to the greater number of adults above age 15 years outside the financial system is the great extent of poverty in Africa in the face of consistent growth in GDP with a mean rate of 5% a year since the last ten years. This suggests that growth in Africa does not seem to benefit the poor and hence not inclusive. Further, it is a generally accepted fact that high GDP growth alone does not improve human development or address the problem of poverty and balanced development. For instance, India has achieved an appreciable GDP growth over the years but this has not translated into improvement in the lives of the broad masses because of inequality (Rajesh, Manish, & Puneet, 2011). Botswana has also gained an appreciable growth in GDP over the years however, this has not resulted in substantial poverty reduction (Fosu, 2009). Hence, the focus of discussion on growth that benefits the people and can reduce poverty is inclusive growth.

Inclusive growth¹ has received much attention in recent years among researchers, analysts, and policymakers' particularly in developing countries because it is thought as a means to ensuring that growth benefits the overall society. World Bank (2014) shows that about 42.5% of the population in Sub- Sahara Africa live in abject poverty compared with other continents such as South Asia (16.2%), Latin America and Caribbean (4.6%); East Asia and Pacific (3.6%); Middle East and North Africa (2.6%); Europe and Central Asia (1.6%) and the World is (11.26%). This gives indication that economic growth per se does not translate to poverty reduction. For growth

¹ *Inclusive Growth* refers to economic growth that benefits the broad masses of a society and the masses also participate in and contribute to the growth process irrespective of their situations.

to reduce poverty and narrow the income inequality gap it must reach and benefit the poorest of the poor in society. Inclusive growth does not only address the inequality issue but also strengthens the poverty reduction agenda. Inclusive growth gives equal opportunities for people irrespective of their economic and social circumstances to benefit from growth and contribute to it (Ali & Zhuang, 2007). Inclusive growth therefore depends on a vibrant economy that generates a lot of opportunities for all.

Poverty² is a challenge that still confronts the world as almost half of the populace in the world depend on less than \$2.50 a day and more than 1.3 billion depend on less than \$1.9 a day. Meanwhile the ten-year average GDP growth around the world is 3.2% but 4.7% in Africa. Max (2016) indicates that the distribution of poverty relative to the population in the world by continent in 2016 was about Asia 55.5%, Africa 31.45%, Europe 0.09%, North America 2.24%, South America 4.49% and Oceania 6.22%. Contemporary discussions on poverty around the globe suggest that though poverty has reduced globally by an average of 25% over the last 30 years, a greater segment of this is credited to China and India. When these two countries are removed from the countries, poverty reduction is considerably low (Fosu, 2010a; Fosu 2010b).

² The World Bank (2015) explains poverty as pronounced deprivation in well-being which comprises many dimensions. It includes low incomes - those who live on less than US\$1.9 a day - and the inability to obtain the basic goods and services necessary for survival with dignity. Poverty also encompasses low levels of health and education, poor access to clean water and sanitation, inadequate physical security, lack of voice, and insufficient capacity and opportunity to better one's life.

One of the causes of poverty in Africa, the second largest continent with poor people is low consumption levels due to inadequate means to finance and other opportunities as well as inequitable distribution of resources (Abebe & Quaicoe, 2014). Access to financial products by poor people is a real avenue to assist them to generate income and enable them to improve their lives. It also offers them the opportunity to engage in economic ventures and to be part of the financial system in times of need. The Global Findex (2017) shows that between 2014 and 2017 financial inclusion³ improved globally as the number of people excluded from the financial system reduced from 2 billion to 1.7 billion people. Access to financial products and markets gives equal opportunities to people who were initially excluded to be part of the economy and contribute to its growth. Financial inclusion is a vital element to achieving and supporting growth (Subbarao, 2009).

For inclusive growth to be achieved there is the need to mobilize financial resources for the economic growth process. Financial inclusion hence, becomes relevant for this mobilization of financial resources. Increased financial inclusion is beneficial to the economy as it fosters capital accumulation and enhances growth. Evidence from Beck, Demirguc-Kunt, and Honohan (2009) suggests that a strong financial system makes finance available to all segments of the society at reduced costs. This contributes to saving and investments and results in economic growth in the long run. Having financial services/ products within the reach of people and using them to meet

³ Financial inclusion is the process of making formal financial products accessible, useable and meeting the needs of members of an economy at an affordable cost. It covers the proportion of adults – aged 15years + - who have access to affordable financial services and use these financial products to meet their need.

their needs enable the people to save, invest and engage in productive economic ventures. This leads to the spread of economic power among a broad mass of the population and also enables them to withstand economic shocks. Some research has revealed that financial access is a major determinant that enables people to improve production and employment activities to help them out of poverty (Aghion & Bolton, 1997; Banerjee, 2001; Burgess & Pande, 2003). The study by Dixit and Ghosh (2013) in India reveals that inclusive growth is needed in order to reduce poverty, unemployment, income inequality, regional disparity; develop agriculture; to develop the social sector and to protect the environment. Financial inclusion is required to provide the needed financial resources to attain these.

Financial inclusion covers both supply and demand factors within the financial system. In a bid to expand financial inclusion, the relevance of financial literacy which is considered a demand side factor cannot be down played. Financial literacy is important to promote accessibility and usage of financial products and to boost prudent financial activities such as wise borrowing, planning and budgeting. It has been debated that absence of financial literacy contributed partly to the worldwide financial crisis in 2008 (World Bank, 2009). The argument is that clients are likely to be cautious to borrow funds that they cannot pay back if they are financially literate. Improved financial awareness coupled with application of financial knowledge fosters consumers' abilities to make informed decisions in their best interest. Financial literacy⁴ enables one to have better

⁴ The working definition of financial literacy in this paper is having basic knowledge about savings, credits (borrowings), investments, insurance, pensions and aptness to use the knowledge to make prudent choices to enhance one's life. This suggests that financial literacy has two dimensions – having the knowledge and applying it. Financial literacy encapsulates financial knowledge, behavior and attitudes.

management of his/her financial life be more effective in using financial services; and helps to improve efficacy and quality of financial products (Lusardi & Mitchell, 2009). Financial literacy is considered a vital component of economic sustainability of an economy (Mitchell & Lusardi, 2015). It helps consumers to make prudent financial choices and deal with intricacies in the financial market and in their day-to-day activities (Lusardi & Mitchell, 2014). Financial literacy equips individuals with information and abilities that enable them to take wise decisions that enhance their well-being generally and financial health particularly. It makes it possible for individuals to save and smoothen consumption especially in developing countries. In addition, Subha and Priya (2014) show that the impact of financial literacy on saving conduct enables mobilization of funds for investment in an economy. Gary, Sebstad, Cohen, and Stack (2009) assert that financial literacy integrated into programmes that reduce poverty, reinforce and influence activities that promote generation of income and good use of resources.

Nonetheless, some studies show that low financial literacy level not only hampers financial decision at the individual level but also the operation of the national financial system and economic well-being (Refera, Dhaliwal, & Kaur, 2016). Arguably, poor financial knowledge may not essentially suggest that individuals are prone to make uninformed monetary decisions because they may seek counsel from professional outlets though this cannot replace acquisition of financial literacy. Engelbrecht (2011) shows that low level of financial literateness in a populace affects the success of poverty alleviation programmes and well-being initiatives. Financial literacy helps improve interventions in health, education and other social development initiatives; and financial goals. To this end, the application of financial literacy can influence inclusive finance, programmes that reduce poverty and socio-economic growth.

The nexus between financial inclusion and financial literacy is that clients require financial knowledge to enable them to analyze and juxtapose financial services and choose those ones that meet their need and enhance their well-being. In addition, financially literate consumers are probable to demand more sophisticated financial products that reinforce competitive pressures on service providers to offer appropriately priced services that can improve further savings. Sevcik (2015) has argued that absence of financial literacy limits reach to financial services and ability to effectively use products accessed. Cole, Sampson, and Zia (2009) also make a case that lack of financial literacy hinders demand for financial products especially when people are not conversant with the products. This is confirmed by the World Savings Bank Institute (2010) and adds that financial knowledge is imperative to achieve financial inclusion amongst the poor. In addition, CGAP (2012) asserts that improvement in financial services due to enhancement in technology calls for financial knowledge and skills especially among the poor and vulnerable groups to equip them to use these services. An evaluation of the link between financial inclusion and literacy would provide insights into how this connection is achieved. It would also emphasize areas of attention to help improve access and usage of financial services that can help individuals undertake productive ventures and improve their well-being.

In other to shore up financial literacy to achieve financial inclusion, financial institutions can have a potential to promote financial literacy and make financial services available to all in a society. Subbarao (2012) argues that financial inclusiveness and financial literacy reinforce each other and that while financial inclusiveness aims to make financial products available to consumers, financial literacy encourages the demand of financial services as knowledge of products increases. In addition, financial literacy can stimulate efficient delivery of financial products. Financial

inclusion has the tendency to deepen financial sector development as it robes the financially excluded into the financial sector which enhance savings mobilization and employment creation. The study of Beck, Demirguc-Kunt, and Levine (2007) confirms this assertion as they find a robust positive connection amid financial development; and poverty and income inequality reduction. At the heart of offering financial products to consumers is the vital role of financial institutions. This gives an indication that financial institutions may promote financial literacy to achieve the financial inclusion process which can help promote inclusive growth.

From the foregoing discussions it is evident that financial inclusion, financial literacy and inclusive growth are three key variables that need to be critically assessed to propel well-being by reducing poverty and also help achieve the global goals. Nevertheless, the existing literature does not adequately address the linkages amid financial inclusion, financial literacy and inclusive growth. To this end, this thesis seeks to first establish the extent of financial inclusion and inclusive growth in Africa; and present empirical evidence on the connection between financial inclusion and inclusive growth. Secondly, it seeks to empirically evaluate how financial literacy impacts inclusive growth and finally analyzes how financial institutions can be a channel to promote financial literacy to achieve financial inclusion.

1.2 Research Problem

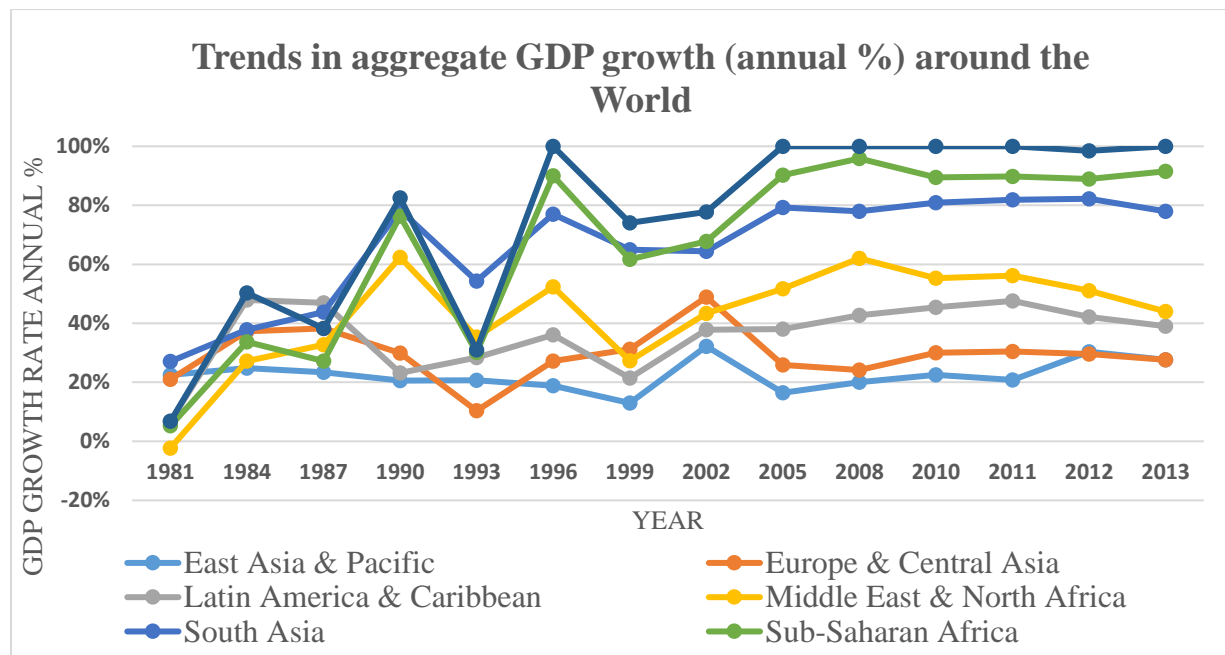
There have been concerns among researchers and policy makers that in Africa the poor seem to be excluded from the benefits of increasing GDP growth. The root for this assertion is that though countries in Africa have witnessed rising economic growth during the 2000s (due to factors such as trade, overseas investment in oil-rich countries and relatively good macroeconomic

management), this growth do not commensurate poverty reduction (Cervantes-Godoy & Dewbre, 2010). One of the reasons for this is that growth seemed not to be linked to sectors that affect the poor and also to create jobs especially in the informal sector (Page & Abebe, 2015). The enormous literature on the connection between economic growth and poverty reduction in Africa shows that the share of the populace that live under the extreme poverty threshold of \$1.9 per day have not reduced considerably compared to the growth in GDP (Chen & Ravallion, 2013; Fosu, 2017). Recent research findings demonstrate that pro-poor initiatives can help distribute the benefits of growth and also create employment that further propels economic growth (Singh, 2017; Anand, Mishra, & Peiris, 2013).

Since GDP has been increasing steadily in Africa but has not resulted in a proportionate reduction in poverty, current discussions are more focused on inclusive growth as an avenue for alleviating poverty which is a challenge on the continent. Figures 1 and 2 show trends in aggregate GDP and poverty around the world respectively. Figure 1 shows a graph of aggregate GDP trends which plots years on the horizontal axis and aggregate GDP growth (annual %) on the vertical axis. The graph demonstrates that GDP has been increasing steadily around the world since 1980's with Sub-Saharan Africa experiencing growth above all the other regions since 2000's. Figure 2 shows a graph of poverty trend around the world. It plots years on the horizontal axis and poverty level (percent) on the vertical axis. Figure 2 illustrates that poverty level measured by the percentage of people living below \$1.9 a day has been reducing progressively around the world especially in the 2000's. Yet, the trend in Sub-Saharan African shows that the level of poverty is high and increasing relative to the world and other regions. This near paradox of increasing growth in GDP and rising

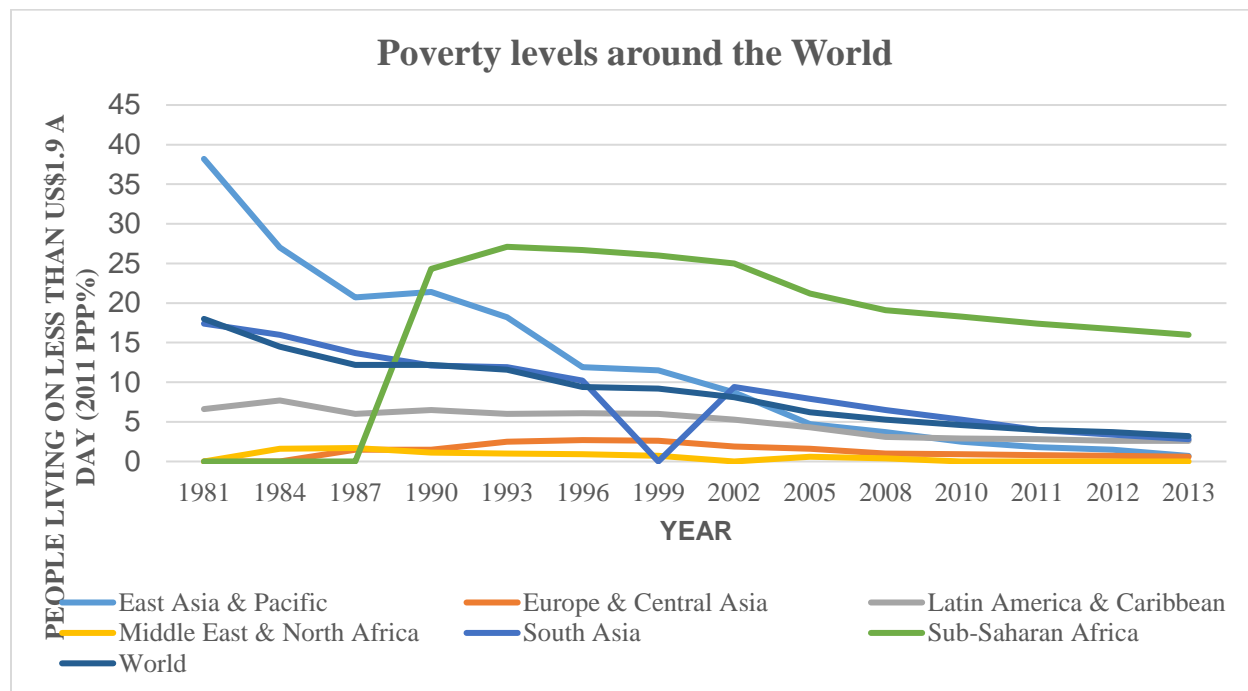
poverty level confirms the assertion that growth in GDP has not reached the masses particularly the poor which is an indication that growth is not inclusive.

Figure 1: Trends in aggregate GDP growth (annual %) around the World



Data source: World Development Indicators, 2015

Figure 2: Trends in Poverty around the World

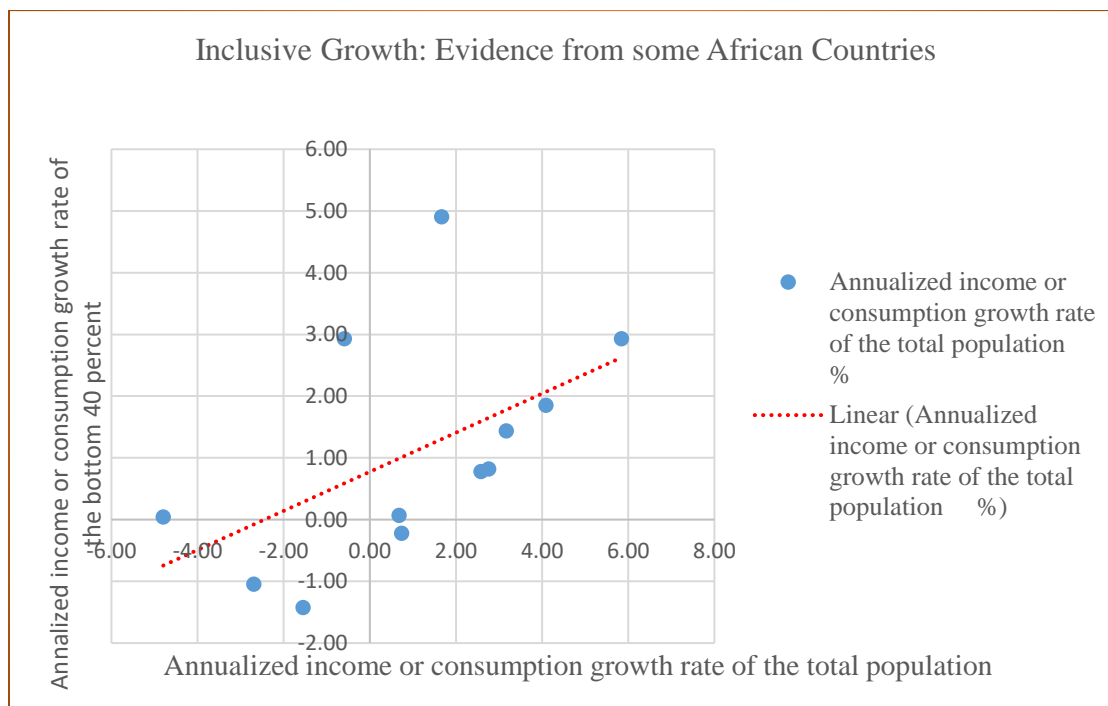


Data Source: PovcalNet 2015

The World Bank provides some information on shared prosperity among countries. The graph of shared prosperity which represents inclusive growth plots “annualized income/consumption rate of the total population” on the horizontal axis and “annualized income/consumption growth rate of the bottom 40 percent” on the vertical axis (World Bank, 2015). The 45-degree line on the graph represents equitable distribution of shared prosperity. Countries with equitable shared prosperity lie above the 45-degree line which suggests that the lowest 40 percent of the populace performed better than the highest 60 percent and are benefiting more from growth. Conversely, those that do not experience shared prosperity lie below the 45-degree line which indicates that the bottom 40% of the populace did worse than the top 60% and are benefiting less from growth. Figure 3 shows that growth in most countries in Africa is not inclusive because they lie below the 45° line. The figure also shows that on average growth in income of the population and that of the lowest 40

percent tend to move closely together. This suggests that the overall growth is a key requirement for shared prosperity.

Figure 3: Inclusive Growth: Evidence from Some African Countries



Data source: World Bank Global Database for Shared Prosperity

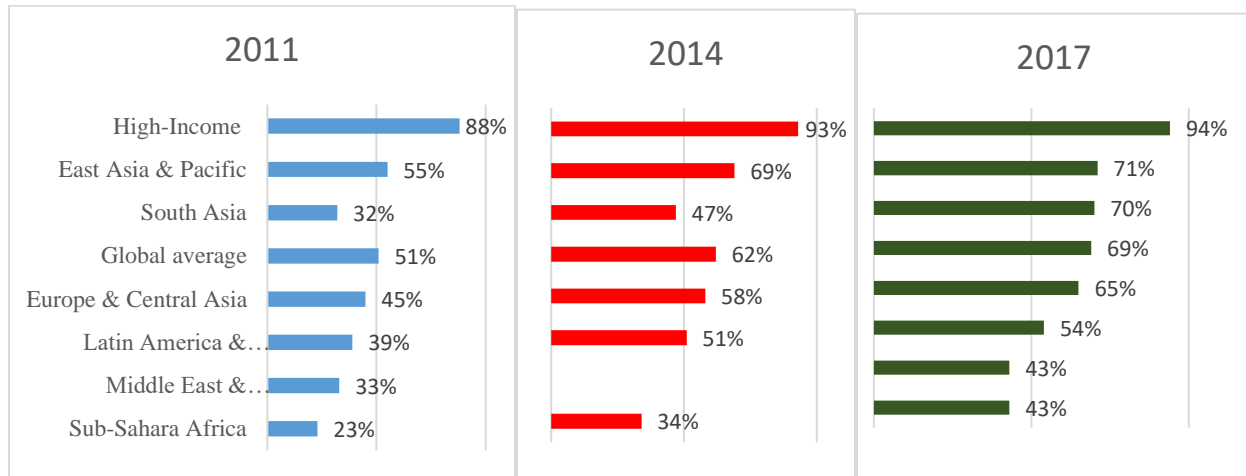
Note: The countries in figure 3 are Egypt, Arab, Benin, Burkina Faso, Cote D’ivoire, Ethiopia, Madagascar, Mauritania, Rwanda, Togo, Uganda, South Africa and Zambia)

One of the causes of poverty in Africa is limited access to capital or financial resources since a number of adults are involuntarily excluded from the financial system (World Bank, 2016). Lal (2018) asserts that access to financial products to the underprivileged is an active avenue to assist them to build some resources that will lead to poverty alleviation. It also offers them the opportunity to increase production and to enjoy protection because the financial space serves as a

bolster in period of need. However, a greater number of people above 15 years in Africa cannot access financial products. There is an increasing evidence that financial inclusion is a vital component for both employment creation and poverty mitigation as financial inclusion is considered a crucial aspect of financial sector improvement which has direct and indirect impact on poverty reduction (Khaki & Sangmi, 2017; Lal, 2018).

According to World Bank (2017) about 1.7 billion adults (about 38% of population of adults above 15 years) lack access to formal financial products worldwide and more than 73% of poor are unbanked. Global Findex (2017) indicates that financial inclusion worldwide is increasing. Figure 4 displays the recent trends in financial inclusion. It demonstrates that between 2011 and 2017 the global average of financial inclusion increased from 51% in 2011 to 69% in 2017. A close look at the trend of Sub-Sahara Africa shows improvement from 23% in 2011 to 43% in 2017. Though this increase is encouraging, it falls behind the global average. Middle East and North Africa exhibit a similar trend to Sub-Sahara Africa.

Figure 4: Trend in financial inclusion Worldwide



Data source: The Global Findex, 2017

A related issue of financial inclusion is financial literacy. Literature suggests that financial literacy can contribute to achieving an inclusive financial environment (Atkinson & Messy, 2013; Grohmann, Kluhs, & Menkhoff, 2017). The argument is that people need to appreciate financial products so that they can analyze, compare and choose products that meet their need and enhance their well-being. In addition, financially literate consumers are most probable to improve their demand for financial products and reinforce competitive pressures on providers of the services to offer transparent and appropriately priced services. It may also improve low savings and the use of other financial products. Absence of financial literacy is usually associated with deprived reach to financial products and limited use of financial services. Also, financial awareness may stimulate financial inclusion because when clients appreciate financial services, they will look for the products, use them and reinforce quality delivery on the part of financial service providers.

An empirical examination of the link between financial inclusion, financial literacy and inclusive growth is worth investigating into with the ultimate aim of identifying specific means of improving the living conditions and well-being of people in Africa. To this end, researchers have focused on different aspects of this relationships. Some studies have examined the relationship amid financial inclusion and economic growth and found that financial inclusion positively impacts economic growth and reduces poverty (Sharma, 2015; Okoye, 2017; Kim, Yu, Hassan, & Kabir, 2018). However, most of these studies are not empirical and do not show how financial inclusion influences economic growth. Also, these studies are relatively narrow in scope by focusing on individual countries. Not much research has paid attention to the connection between financial inclusion and inclusive growth. This may be so probably because inclusive growth is quite nascent concept.

The few studies on this relationship are theoretical studies in individual countries and policy papers (Sukhla, Gupta, & Gupta, 2012; Dixit & Ghosh, 2013; Shah & Dubhashi, 2015; Demirguc-Kunt, Klapper, & Singer, 2017). These studies suggest that financial inclusion can influence inclusive growth without any empirical analysis. There is therefore the need to empirically evaluate the association between financial inclusion and inclusive growth especially within the African context. This study fills this gap because to the best of this researcher's knowledge an empirical study that examines the nexus between financial inclusion and inclusive growth by decomposing inclusive growth into benefit and participation component do not exist in the literature.

More so, some studies have explored the place of financial literacy in relation to growth. Notable among these studies are the works of (Klapper, Lusardi, & Panos, 2013; Lusardi, 2012; Kimball & Shumway, 2010; Lusardi & Tufano, 2009; Guiso & Jappelli, 2008). These studies demonstrate

that more financially literate people, take prudent financial decisions such as savings, borrowings, investing and are better placed to secure their future and acquire diversified investments. Financial literacy becomes more essential when individuals take on the responsibility to plan their finances themselves. The reason is that financially illiterate individuals are more susceptible to acquire credit from informal sources which are more expensive and may make the individuals poorer in the future as their debt burden increases.

Further, other studies assessed the association between financial literacy and inclusive growth. Batsaikhan (2018) in a policy contribution paper in the European Union find that financial literacy becomes relevant with improved economic development. Dinesha (2017) in a study in India adds that financial literacy contributes to savings and promote inclusive growth. Empirical assessment on this relationship is necessary in Africa where there is dearth research on the subject. Also, since development policy seeks to reduce poverty and enhance welfare to enable people contribute to growth, it is imperative to evaluate the nexus amid financial literacy and inclusive growth in Africa.

Further, some researchers have examined the association between inclusive finance and financial literateness and reported that financial literateness improves resourceful use of financial products (Commission on Growth, 2008). Lusardi (2009) confirms this assertion that possessing financial knowledge enables the underprivileged to assess diverse financial services and make prudent financial plans. OECD/INFE (2013a, 2013b) adds that financial acumen improves the poor's reach as well as use of financial services. Grohmann et al. (2017) reveal that financial awareness is

strongly linked to greater financial inclusion. Further, Atkinson and Messy (2013) demonstrate that scant thresholds of financial inclusion are connected with poor awareness of financial information in OECD countries. Sinha and Gupta (2014) test whether financial literacy is influenced by financial inclusion in India and add that financial inclusion significantly impacts financial literacy.

On the contrary, Wachira and Mkihui (2012) in a study in Kenya find that usage of and accessibility to financial products do not depend on financial knowledge but rather on income, household size and the closeness of the financial service provider. Hence, they suggest that financial literacy does not impact financial inclusion. This outcome is corroborated by Bongomin et al. (2016) whose study demonstrates that financial literacy does not directly impact financial inclusion. They further examined how social capital can influence financial literacy to achieve financial inclusion in Uganda and find that financial literacy impacts financial inclusion when social capital plays an intervening role. This gives indication that financial literacy does not impact financial inclusion directly. However, Bongomin et al. (2016) focused on only one country in Africa.

Based on the conflicting results on how financial literacy and financial inclusion are connected, it is relevant to examine a channel through which this relationship is established or otherwise. Since financial institutions have a key potential to enhance financial literacy and financial inclusion, it is imperative to empirically examine how financial institutions can be a medium through which

financial literacy can influence financial inclusion. Hence, the researcher explores the relationships among financial literacy and financial inclusion using financial institutions as a mediator variable.

1.3 Research Objectives

The goal of this thesis is to investigate the relationships among financial inclusion, financial literacy and inclusive growth in Africa. The specific objectives we seek to achieve are:

1. To determine the extents of financial inclusion and inclusive growth in Africa by computing an index; and to empirically establish the relationship amid financial inclusion and inclusive growth.
2. To examine the relationship between financial literacy and inclusive growth in Africa relative to other developing countries.
3. To investigate the mediating role of financial institutions between financial literacy and financial inclusion.

1.4 Research Questions

In this study we seek to find answers to the following questions:

1. What is the extent of financial inclusion and inclusive growth in Africa? What is the nexus between financial inclusion and inclusive growth?
2. What is the link between financial literacy and inclusive growth in Africa relative to other developing countries?

3. Do financial institutions play a mediating role between financial literacy and financial inclusion?

1.5 Significance of the Study

This thesis makes a number of contributions to both literature and practice in a number of ways. Firstly, it computes an index to ascertain the degree of financial inclusion in Africa using recent data. A recent index is necessary for tracking the individual countries performance across the access and usage dimensions of financial inclusion over time. It also serves as a benchmark to assess and compare how countries have improved or otherwise over time. This would enable policy makers to appraise the effectiveness of previous interventions undertaken to improve financial inclusion and to identify where to focus attention to attain broader financial inclusion in the region. In addition, this thesis expands the indicators used to compute previous indices (Sarma, 2008; Wang & Guan, 2016) to include key usage indicators such as remittances and withdrawals which enhance the index by widening its scope.

Secondly, this thesis contributes to the discussion of the measurement of inclusive growth by computing an index. The measurement of inclusive growth is a focus of discussion in the literature with different researchers proffering different approaches to measuring the concept. For instance, the World Bank (2015) used the Hausman, Rodrik, and Velasco (2008) framework while Suryanarayana (2013) used welfare measures such as the incidence of poverty to estimate inclusive growth. Adedeji et al. (2013) and Ali and Son (2007) used the social opportunity function which is akin to the social welfare function to measure the concept. Klasen (2010) also applied the

poverty equivalent rate used to measure pro-poor growth to measure inclusive growth. The major limitations of these measures are that each measure focuses on only some aspect of inclusive growth which is either on income or non-income aspects. Besides, these measures are unable to estimate the exact level of change in inclusive growth at a point in time.

Note (2012) employed the geometric mean approach using indicators that are an extension of those used to compute the Human Development Index to compute a composite index for inclusive growth. However, the challenge with using the geometric mean is that it is sensitive to outliers which may distort the final measure. This study fills the gap by computing a composite index using indicators proposed by ADB (2011) that are normalized and weighted in the different components. It follows an approach similar to that of Sarma (2008) except for the weighting method. This is to help measure the concept at a point in time and also serve as a basis for comparison.

Furthermore, the thesis adds to the dearth literature on the nexus between financial inclusion and inclusive growth by empirically analyzing the relationship between financial inclusion and inclusive growth in Africa. The analysis decomposes inclusive growth into participation and benefit dimensions for more detailed analysis to focus policy decision. As indicated earlier, discussion on this relationship in the literature has been dominated by theoretical and policy papers with virtually no empirical studies.

In addition, this study makes a contribution to the discussion linking financial literacy to inclusive growth by evaluating the situation on Africa relative to other developing countries. This analysis has implication for policy makers in Africa to embark on national financial literacy programmes as done in some advanced countries like the USA and Australia due to the relevance of financial

literacy in promoting entrepreneurial activities. This thesis broadens the analysis of this subject to cover the African continent compared to works that center on communities (Oseifuah, 2010).

Finally, the inconclusive confirmation on the nexus between financial literacy and financial inclusion makes this study imperative. This thesis contributes to this debate by evaluating how financial literacy impacts financial inclusion using financial institutions as a channel or mediator for promoting financial literacy to achieve financial inclusion. This analysis helps to reconcile the differences in the two strands of findings in the literature on the relationship between financial literacy and financial inclusion. Some studies find that financial literacy impacts financial inclusion while others do not. This study adds that financial literacy influences financial inclusion but through a mediator variable (financial institutions). The study employs both the casual steps approach by Baron and Kenny (1986) and the bootstrap approach by Preacher and Hayes (2004) to mediation analysis. This extends the methodology for evaluating mediation relationships in both academia and practice.

1.6 Scope and Limitations of the Study

This study ascertains the extent of financial inclusion and inclusive growth in Africa for 2014⁵. The study further examines the nexus between financial inclusion and inclusive growth for the period 2004 to 2014. Further, it investigates the connection between financial literacy and inclusive growth for Africa relative to ninety-three (93) developing countries for the period 2014. Finally, it evaluates the intervening function of financial institutions in financial literacy and financial

⁵ Global Findex released 2017 data on financial inclusion around the World in March, 2018, though the differences between the indicators of 2014 and 2017 is not very vast.

inclusion for the 2014. The choice of countries in Africa as a unit of study was influenced by the challenges that confront the continent in this area and the limited number of studies on the subject in Africa. Secondly, it is to establish findings that will influence strategies to improve the well-being of the poor on the continent. The study covers all countries in Africa for which sufficient data is available. Hence, the index of financial inclusion was computed for thirty-seven (37) countries while that of inclusive growth was computed for forty-four countries (44).

The main limitation of the research is data unavailability and insufficiency for some countries. The study could not examine all the countries in Africa due to data challenges for some countries. Also, the analysis on the linkage between financial literacy and inclusive growth; and that of the mediating role of financial institutions on financial literacy and financial inclusion are cross-sectional studies. A longitudinal study would have been preferred as it gives information on trends for a period and provides a relatively higher accurate output when observing changes. Other advantages of a longitudinal study are: they are highly flexible; more potent than cross-sectional studies; very effective in doing research on developmental trends and can ensure clear focus and validity. However, due to data unavailability this could not be done. Moreover, it would have been insightful to break down the countries in Africa into the five main regions – North, West, East, Central and Southern Africa – and analyze these regions in order to ascertain whether there are regional differences in Africa. Yet, data insufficiency did not permit this analysis to be carried out.

1.7 Structure of the Thesis

This thesis is structured in five chapters. The first chapter introduces the thesis by presenting the background, the research problem, research objectives, research questions, significance of the study; and the scope and limitations. Chapter two presents a detailed review of theoretical and empirical literature and outlines some stylized facts about financial inclusion, poverty and aggregate GDP growth in Africa relative to the other regions. Chapter three discusses the various methodologies employed to achieve the research objectives of the thesis. Chapter four presents the results and the analysis. The final chapter presents the summary of findings, conclusions, contributions, recommendations, limitations and direction for further research.

1.8 Chapter Summary

This chapter has focused on the introduction of the thesis. It provided the background of the study, research problem, research objectives, research questions and significance of the study. In addition, it provided the scope, limitations and the chapter layout of the thesis.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter thoroughly reviews theoretical and empirical literature on financial inclusion, financial literacy and inclusive growth to firmly ground the research. It starts by reviewing theoretical literature on the relevance, measurement of the concepts and theories that establish link between financial inclusion, financial literacy and inclusive growth in Section 2.2. Section 2.3 reviews empirical literature on the relationship between financial inclusion and inclusive growth, between financial literacy and inclusive growth and between financial literacy and financial inclusion. Section 2.3 presents a conceptual framework for the study and finally section 2.4 presents some stylized facts on financial inclusion, growth and poverty in Africa.

2.2 Review of Theoretical Literature

2.2.1 Theoretical Literature for Financial Inclusion

2.2.1.1 Definitions and Relevance of Financial Inclusion

Financial inclusion focuses on delivery of formal financial services (savings, credit, remittances, money transfer, insurance, mortgages, pensions, security markets) in accessible and useable manner to meet the needs of all members of an economy especially low income groups at an affordable cost. Rangarajan (2008) defines financial inclusion as the “process of ensuring access to financial services and providing timely and adequate credit where needed to vulnerable groups such as weaker groups and low income groups at an affordable cost”. This definition of financial

inclusion focuses mainly on access with little emphasis on usage and quality which are key aspects of the concept. Chakrabarty (2013) also defines the concept as “the process of ensuring access to appropriate financial products and services needed by all sections of society including vulnerable groups as such weaker sections and low income groups at an affordable cost in a fair and transparent manner by mainstream institutional players”.

Sharma and Kukraja (2013) point out that financial inclusion is relevant for the households, financial institutions and the economy. It enables households to get access to credit to undertake productive economic ventures that improve their well-being, save and invest. Financial inclusion broadens the customer base of financial institutions as it offers a means that bring savings of those who were excluded into the formal financial system. This enables financial institutions to diversify as the large number of low cost deposits enables the institutions to lessen their dependency on bulk deposits and increase their profitability. The economy benefits from financial inclusion as it promotes savings, creates businesses, sustains the financial system and makes it more efficient, generates employment and sustains equitable growth. Globally, financial inclusion has been identified as the enabler to attain seven of the sustainable development goals. These include eliminating poverty and hunger, creating jobs, improving gender equality and good health.

According to Biasharaleo (2017), other importance of financial inclusion includes: enabling the poor to address poverty challenges in a sustainable manner; promoting monetary policy by including a great percentage of the populace in the mainstream financial system. They argue that

monetary policy cannot work effectively when many people are outside the financial system. It also stimulates building of strong institutions to increase financial system sustainability.

2.2.1.2 Measurement of Financial Inclusion

Financial inclusion has been measured in a number of ways in the literature. Some researchers use a number of indicators on either the demand or supply fronts to measure the concept. For instance, Demirguc-Kunt and Klapper (2012) focus on demand side indicators that suggest usage to measure financial inclusion. The core indicators address five areas of activity: borrowing, saving, insurance, making payments and operating an account. On the other hand, the Financial Access Survey (FAS) and the Alliance for Financial Inclusion (AFI) compliment the demand side of the Global Findex by focusing on the supply side indicators. FAS provides information on the use and accessibility of financial services like deposits, loans and insurance policies in the world. The AFI (2013) core indicators also cover access and usage dimensions with indicators such as number of access points, percentage administrative units, account type and percentage of adults with an account type.

The concept is usually measured by assessing how many people own and use formal financial services/products. The consensus in the literature is that financial inclusion has three main dimensions of access/availability/outreach/penetration, usage and quality. Due to its multiple dimensions using a single indicator to measure the concept might not capture it fully. Sometimes, a composite indicator is used to measure the level of financial inclusion. Nonetheless, how this composite measure is computed has been an issue of discussion in the literature. There seem to be a lack of consensus on how it should be robustly measured. Different researchers have measured

financial inclusion using an index but with varied approaches in the weighting, aggregation of variables, data and econometric estimation.

Beck, Demirguc-Kunt, and Levine (2007) use variables that relate to physical access, affordability and eligibility (deposits, loans and payments). Their study ranked the performance of countries by dimensions and a country had different rankings in different dimensions which makes it challenging to determine the extent of financial inclusion in a given country and to compare across countries. Honohan (2008) uses econometric model to measure the share of individuals that have access to financial products to the total populace. In that study, the usage dimension of financial inclusion was not analyzed and also econometric estimates arguably provide a one-time estimate of financial inclusion which cannot be used to measure variations across time and countries (Sarma, 2012).

In a bid to improve how financial inclusion is measured, Chakravarty and Pal (2012) computed a composite financial inclusion index using banking sector indicators that relate to access, usage and availability of banking services. They used equal weighting of variables in the dimensions in their analysis without providing a basis for the weighting method. This suggests that all indicators contribute equally to financial inclusion. Mialou, Amidzic, and Massara (2017) criticized an index that assigns the same weights to all variables and dimensions because applying the same weights suggests that all dimensions have the same relevance on financial inclusion which may not reflect the reality in practice. They used factor analysis to derive the weights for their analysis which made the weighting approach relatively objective compared to the equal weighting. A setback of the work of Mialou et. al. (2017) is that the variables for computing the index are only four variable and do not include indicators that cover payments, remittances and mobile accounts.

Wang and Guan (2016) suggest a computed weighting approach using the coefficient of variation approach originally used in portfolio analysis. In their study, they computed an index for financial inclusion by determining the weight of the indicators and dimensions using the coefficient of variation. The weight of the indicators was defined as the share of its coefficient of variation to the sum of all indicators coefficient of variation. They argued that this approach helps to determine the comparative relevance of each indicator and dimension to the overall index.

2.2.1.2.1 Remittances and Financial Inclusion

Remittances have become a focal subject of discussion in the global development agenda for the past decade. Its inflows to Africa has increased from about 10% in 2010 to about 32% in 2014 (IMF, World Economic Outlook, 2015). Remittances are defined as cross-border, person to-person payments of relatively low value and it represents a key flow of foreign currency into a country. It constitutes an important source of finance to many households and brings a number of benefits to recipients. These include enabling households: to improve health, access education, pay rent, embark on entrepreneurial activities and raise their living standards.

Remittances are often the initial experience of a financial service for especially recipients who are poor. These payments are often the entry point into the financial system and further activate financial inclusion (Toxopeus & Lensink, 2007). Hence, remittances can be the channel through which the financially excluded can be integrated into the financial system and create an avenue for other inclusive and sustainable financial services. The relevance of remittances cannot be underestimated as it benefits the economy as a whole, communities and households. For the

economy, it provides recipient countries with a source of foreign currency which makes it easier for governments to borrow money at a lower cost (The International Fund for Agricultural Development, 2015). The community benefits from received remittances through improved community infrastructure. This usually takes the form of migrant philanthropy where migrants donate and invest funds in their communities. These help offer jobs to the local communities and also provide social amenities such as schools, medical and community centers. To the households, remittances provide a regular inflows of funds to finance the household's budget that can be volatile and seasonal particularly in rural areas. These monies are basically spent on necessities such as food, clothing and shelter; human capital, health and housing. Hence, remittances can help alleviate poverty for the households.

With these benefits, remittances can be a source of demand for financial services and contribute to financial inclusion because they play a role to increasing demand for financial services by making recipients to be part of the formal financial sector. This can be achieved when remittances are received through regulated financial intermediaries when people can save and invest. Further, a close look at the service model for receiving remittances such as online account, cash account, account to account, online cash, cash to cash and account cash (Trade and Development Board, 2014) suggests that remittances can play a critical role in financial inclusion.

From the discussions above, it is imperative that indicators that are used to compute a financial inclusion index to measure the extend of financial inclusion should include remittances. So far, studies that have computed financial inclusion index did not consider this variable. This study computes an index of financial inclusion that includes remittances as one of the key indicators.

2.2.1.2.2 Withdrawals and Financial Inclusion

Withdrawal is one of the activities that indicates the rate of usage of accounts at financial institutions. Increasing cash withdrawal volumes has the tendency to lead to a strong demand for ATM services and other innovative products. For instance, Retail Banking Research (2017) indicates a rising trend in ATM withdrawals as cash withdrawals grew by 10 percent in 2015 to 99 billion with appreciable increases in withdrawals in Africa and Asia-Pacific markets. This suggests that withdrawals especially through ATMs can be a tool to drive financial inclusion as it offers efficiency and affordability for financial institutions and helps consumers to improve their control of their financial matters. Due to the role withdrawals plays in financial inclusion, this study again includes withdrawals as one of the indicators used to compute the financial inclusion index.

Having discussed the measurement of financial inclusion that exists in the literature, it is helpful to explore some of the theories that examine the concept to ground the study.

2.2.1.3 Theories of Financial Inclusion

2.2.1.3.2 Theory of Asymmetry Information

This theory propounded by Akerlof (1970), Spence (1973) and Rothschild and Stiglitz (1976) suggests that there is an imbalance of information between lenders and borrowers which can lead to inefficient outcomes in the financial market. Asymmetry information refers to a situation in which some agents in a trade possess information while other agents involved in the same trade do not have this information. This leads to price distortion and optimal allocation of resources is not achieved. When this is applied to financial inclusion, inadequate information about potential

borrowers and lenders as well as knowledge of some financial products may result in depriving some individuals (especially the vulnerable and low income earners) access to financial services. Sometimes, financial institutions find it challenging to manage the barrier of information among low income group and this inhibits how easily the institution provides services to this group of people. This lack of appropriate information about some borrowers; and some borrowers also not having adequate information about services of financial institutions can affect the level of financial inclusion.

2.2.1.3.3 Free Market or Shareholder Wealth Maximization Theory

The free market or the shareholder wealth maximization model suggests that a deregulated economy is likely to draw closer to pareto optimum and interventions of government will prevent the economies from attaining growth. The theory explains the extent of financial inclusion in a country level. It argues that deregulation can increase financial inclusion because the market led schemes result in improving financial services. Yet, the risks associated with lending tend to restrict financial institutions to focus on some groups of people leading to low inclusion or inclusion of other groups that appear not to add much value to the financial institution's activities. Boyce (2002) observes that customer valuation is shown to have become a means to increase shareholder income and wealth almost certainly at the cost of further marginalizing the poor and disadvantage. Hence, deregulation could worsen financial inclusion where financial institutions would turn their focus to more profitable customers in order to improve profits. The theory suggests that participants in the market should focus on maximizing worth in a fair manner.

2.2.1.4 Theories that relate Financial Inclusion to Growth

2.2.1.4.1 Endogenous Growth Theory

An analysis of growth starts with the classical endogenous growth theory which suggests that investment in manpower and inventions adds to economic growth. The basic tenet of this theory is that government policy measures influence long term growth in a nation. Smith (1776) emphasized that capital stock sways labour productivity. He opined that capital stock drives research and development, extends markets and generates greater demand which is a key driver of growth. Smith further argues that economic growth is an endogenous event whose rate of growth rests on the decision and activities of agents and intimated that capital stock enhances production capacity of agents. This theory can serve as a foundation to evaluate the link between financial inclusion and inclusive growth.

Ricardo (1891) opines that saving and investment emanate from earnings of productive activities which propel growth. Relative to financial inclusion and inclusive growth, capital accumulation is seen from the perspective of financial resources. As more of the citizenry become financially included, all things being equal, a lot more people are able to contribute to growth by undertaking productive economic venture and this broadens the base of the economy. In the neo-classical growth framework, growth rate is determined externally by the saving rate (Domar, 1946; Harrod, 1939) or technological advancement (Solow, 1956). Nonetheless, the rate of saving and technological advancement are yet to be clearly determined.

2.2.1.4.2 Empowerment Theory

Another theory worth considering is the empowerment theory propounded by (Sen, 1999). He used this theory to explain the existence of poverty and how it can be attacked. He opined that poverty is more than low income but encapsulates lack of political and psychological power. His view is that most modern societies deprive some citizens of power and control which make them poor. To address this, Sen asserts that society ought to provide all citizens with political, financial and social choice; protection; and transparent executive activities. This theory was expanded by the World Bank (2001) to develop a three-pillar theory of poverty. This is related to the absence of security, empowerment and opportunity (Carr & Sloan, 2003; World Bank, 2001). These three pillars provide a foundation for concerted effort to fight poverty. The relevance of this theory to this study is that financial inclusion can be this empowerment tool that can be used to fight poverty and enable economic units to contribute to growth.

2.2.1.4.3 Schumpeter's Theory

A related theory to this study is the theory of Schumpeter (1911) which holds that for economic growth and development to be attained, there should be identification and optimal utilization of factors of production to innovate and increase output which will require funds. Schumpeter asserts that entrepreneurs who are innovative, creative and have foresight need access to finance to be able to implement their innovations. He added that a strong financial system serves as a conduit to make financial resources available to the most efficient user hence, finance leads economic growth. This is the finance-led hypothesis. A cardinal point of this theory is that financial institutions are important drivers of innovation and growth. Thus, mobilization of factors of production of which financial capital is key is a significant characteristic of any growth process. The Schumpeterian

model of economic growth revolves round inventions and innovations of which credit plays an important role because access to credit enables the entrepreneur to have command over other factors of production. Schumpeter also adds that economic growth hinges on technical settings of the economy which are largely influenced by creation of credit and financed by bank-credit expansion. However, one limitation to his assertion is that in the short run the bank credit may be helpful for industrial development but in the long run bank loan may be inadequate for development. Hence, other sources of finance such as sale of shares will have to be considered to raise long term finance. The thrust of this theory is that finance is very relevant to achieving growth.

2.2.2 Theoretical Literature for Financial Literacy

2.2.2.1 Financial Literacy defined

Financial literacy is a multi-dimensional concept (Hung, Parker, & Young, 2009; INFE, 2012) that encapsulates: numeracy skills (Klapper, Lusardi, & Panos, 2012; Widdowson & Hailwood, 2007); knowledge of financial terms and instruments (Kefela, 2011; Servon & Kaestner, 2008; Mandell, 2008; Habschick, Seidl, & Evers, 2007; Beal & Delpachtra, 2003); and the skill and confidence to undertake financial activities (Robson, 2012; Remund, 2010; Lusardi & Tufano, 2009; Emmons, 2005), especially preparation for the future and insurance (Lusardi & Mitchell, 2011; Emmons, 2005; Basu, 2005).

Generally, financial literacy refers to the skills set that enable people to use and manage their finances wisely. These skills include numeracy, understanding of financial concepts (examples inflation, discounting, interest rates, compounding, diversification, understanding of the working

out of risk and return); knowledge of financial instruments/products/ services (stocks, bonds, investment funds); and an appreciation of the link between consumers own finances and that of the wider economy. The consensus in the literature is that financial literacy generally relates to awareness of financial products/services, terms; ability to undertake financial activities like planning, investing, saving and the poise to take financial decisions. However, different researchers have explained financial literacy with emphasis on varied aspects.

Noctor, Stoney, and Stradling (1992) explain financial literacy as “the ability to make informed judgments and to take effective decisions regarding the use and management of money”. It is the ability to appreciate financial situations that improve welfare. This comprises the skill to distinguish financial alternatives and make prudent financial choices on a regular basis when the need arises (Vitt, Anderson, Kent, Lyter, & Siegenthaler, 2005). It is considered a fundamental understanding that individuals require in order to navigate the rapidly changing financial landscape (Kim, 2001).

OECD (2005) defines the concept as “as the process by which financial consumers improve their understanding of financial products, concepts and risks and, through information, instruction and/or objective advice, develop the skills and confidence to become more aware of financial risks and opportunities, to make informed choices, to know where to go for help, and to take other effective actions to improve their financial well-being.” Mandell and Klein (2009) also define financial literacy as what individuals need to know to equip them to make informed financial choices that improve well-being. Lusardi and Mitchell (2011) view the concept “as the knowledge of basic financial investment concepts such as inflation and risk diversification and the capacity to do calculations related to interest rates”.

In the functional form, financial literacy relates to awareness of financial products/instruments, concepts and activities/ processes such as budgeting, planning, investing, borrowing, saving and possessing the expertise to use financial resources to make sound decisions. In a similar vein, Kempson, Collard, and Moore (2006) view financial literacy from three aspects of knowledge (understanding how to), attitude (confidence and motivation to apply the how to) and behaviour (applying the knowledge in practice) in areas of, keeping track, choosing wisely among financial alternatives, coping and being informed. This definition is similar to that of Livengood and Venditti (2012) who view financial literacy as “ability of users to find and access authoritative financial information, the construction of a foundation of financial knowledge sufficient to evaluate information and immediate situational choices, and finally the confident and ability to make financial decisions sufficient to achieve a lifetime of financial wellbeing”.

The United States Financial Literacy and Education Commission (US FLEC, 2007) conceptualizes financial literacy as the aptitude to apply knowledge and skills to manage financial assets efficiently over a considerable period of time. The OECD (2012) adds that financial literacy is a process where people enhance their appreciation of financial instruments, concepts and risks in a manner that enables them to make decisions confidently to enhance their welfare. Robb, Babiarz, and Woodyard (2012) explain the concept as the ability to comprehend financial material and apply this efficiently to make informed choices. Three focal things that stand out in the definitions of financial literacy are having financial knowledge, skills and confidence/attitude that influence financial behaviour. Kempson et al. (2005) argue that financial literacy is relative and continuous hence, at no point can there exist a perfectly financial literate person and there is no benchmark

for pass or fail that separates financial literacy from illiteracy. Their argument suggests that financial outcomes are not a good proxy of financial literacy because there can be a gap between knowledge and application of that knowledge.

2.2.2.2 Relevance of Financial Literacy

The relevance of financial literacy cannot be over-emphasized because it spans across the individual, the financial system and the economy at large. At the individual level, it equips people with knowledge to take prudent financial decisions that relate to saving, investing, borrowing, financial planning and general financial management that improve their standard of living (Mandell, 2008). Financial literacy can prepare people especially the vulnerable to appreciate complex financial systems and facilitate use of financial services and reduce risk related to financial choices. Evidence shows that people with low financial literacy acquire low assets (Lusardi & Mitchell, 2007); partake less in the main stream financial system (Alessie, van Rooji, & Lusardi, 2011); access credit at greater costs (Lusardi & Tufano, 2015; Stango & Zinman, 2009); plan less for retirement (Lusardi & Mitchell, 2007); and are predisposed to nonpayment of debts especially mortgages (Girardi, Goette, & Meier, 2013). These evidence give indication that absence of or inadequate financial literacy can result in ineffective financial choices especially when individuals have to make their own financial decisions. This negatively affect the optimization of welfare.

Lusardi and Mitchell (2014) argue that consumers with financial knowledge tend to spend smaller proportions of their current high earnings and invest more for future use. Thus, financial literacy enhances consumption smoothing. Modigliani and Brumberg (1954); and Friedman (1957)

theorize that consumers organize their top savings and consumptions in a manner that spreads and enable them to maintain a consistent standard of living over their lifetime. These models commonly conjecture that consumers have the acumen to plan and execute effective financial decisions in a growing complex financial system. Nonetheless, only few consumers have the needed financial information and skill to do these. Also, not much studies have examined the motivations for acquiring financial knowledge; and to investigate the nexus between financial literacy and investment performance of consumers (Lusardi, Michaud, & Mitchell 2013; Jappelli & Padula 2013; Hsu 2011; and Delavande, Rohwedder, & Willis 2008).

In the financial system, financial literacy can contribute to economic stability and enhance discipline in the system as financially erudite people are less prone to nonpayment of debt obligations which will minimize the default rate in the financial market. In addition, financially literate customers are likely to demand more sophisticated products which would foster innovation in the financial system (Lusardi & Mitchell, 2014). The financial market will perform more efficiently when participants have financial knowledge because financial literacy influences how individuals save and borrow not only for themselves but also for long term national interest as funds are channeled from domestic savings to productive ventures. Further, the literature suggests that financial literacy is currently more relevant because the financial setting is becoming more intricate daily (Livengood & Venditti, 2012; Spiranec, Zorica, & Simoncic, 2012). They argued that due to trends such as globalization, greater obligation on the part of individuals to shoulder their financial well-being over time and growth of on-line financial environment, financial literacy has become imperative.

Globalization has augmented labour competition (Allum, 2013; Wiig (2007) and growth of financial markets where financial instruments are offered to individuals who may have limited financial literacy pose a challenge to investors (Spiranec et al., 2012). Financial markets have become more complex to steer through because consumers have greater responsibility for their future financial security. Financial choices have also become ubiquitous as people have to make their own secured financial plans regularly (Gavigan, 2010; Livengood & Venditti, 2012; Spiranec et al., 2012). Financial literacy may influence the risk taking behaviour and performance of small and startup ventures which with its repercussion on the entire economy.

In recent times, most consumers have to deal with issues such as mortgage, pension funds, borrowings and diverse investment products themselves. Also, the growth of on-line financial environment has influenced financial activities on the market by offering greater access to products and services and reducing the use of middlemen when accessing information about the financial system. This enables most investors to search for information on-line instead of seeking professional counsel from advisers (O'Connor, 2013; and Spiranec et al., 2012). Other factors such as growth of the financial environment and the development of innovative products, increasing consumers, decreased regulation of financial markets (Reifner & Herwig, 2003) have perhaps contributed to the complexity of making decisions which make basic financial literacy necessary for all.

Further, it has been argued that it may be useful to apply behavioral theory to study and shed light on financial literacy and financial conduct (Schuchardt, Bagwell, Bailey, DeVaney, Grable & Leech, 2007). Xiao (2008) adds that behavioral theory can also be used to examine the dynamics

that influence financial behaviors of individuals because this may enhance financial knowledge and security.

2.2.2.3 Relevance of Financial Literacy for Inclusive Growth

The evidence from the literature suggests that financial literacy is relevant for growth because it influences savings and investments positively; and reduces debt as a result of high cost of borrowing. This has the potential to improve well-being and increase consumer participation in the financial market. Honohan (2008) demonstrates that households are key users of financial services and their asset holdings play a role in boosting financial market development. Evidence has also shown that financial sector improvement promotes GDP growth as nations with strong financial structures tend to exhibit lower income poverty and inequality (Beck, Demirguc-Kunt, & Martinez Peria, 2007).

Financial literacy therefore has a potential for the achievement of inclusive growth. The debate is that as more savings and investments are mobilized, economic activities are likely to increase as people participate in the financial system and this can broaden the base of the economy. Also, people with financial literacy background tend to make informed choices that go a long way to improve their financial security and contribution to economic activity.

Studies show that financial literacy is positively linked to savings and investment choices; and preparing for future retirement and building assets (Hastings & Mitchell, 2011; Lusardi & Mitchell, 2007; van Rooji, Lusardi, & Alessie, 2012). Disney and Gathergood (2013) add that

people with strong financial acumen tend to have greater earnings and better saving habits. Other research confirms that having financial knowledge is positively associated with favourable financial performance and weak financial literacy correlates with greater indebtedness which incur higher costs, default and delinquency (Duca & Kumar, 2014; Disney & Gathergood, 2013; Gerardi, Goette, & Meier, 2010). Lusardi and de Bassa Scheresberg (2013) add that awareness of financial concepts have a strong inverse association with greater cost of credit even after considering the level of education, income and other factors that indicate financial fragility.

2.2.2.4 Measurement of Financial Literacy

Financial literacy is commonly appraised at the individual, the aggregated (to represent a group, example high school students or retirees) and at the country levels. Individual researchers and institutions have suggested ways to measure the concept. Of particular interest are the works of Lusardi and Mitchell (2011b), Organisation for Economic Cooperation and development/Integrated Non-Formal Education (OECD/INFE), and Standard and Poor's Rating Services Global Financial Literacy Survey (2014). Lusardi and Mitchell (2011a) developed three basic questions to assess awareness of basic concepts relating to financial choices. The questions relate to knowledge and understanding information that are relevant in making saving and investment decisions. These address numerical competence and the aptitude to calculate interest rates and an appreciation of inflation and portfolio diversification.

In line with OECD's explanation of the subject "as a combination of awareness, knowledge, skill, attitude and behaviour necessary to make sound financial decisions and ultimately achieve individual financial wellbeing". Atkinson and Messy (2013) developed a questionnaire that measures financial literacy. The questionnaire is made up of eleven (11) main questions that cover

the areas of behaviour (tracking money, making ends meet, selecting a financial product, and short and long term planning); knowledge (time value of money, simple and compound interest, risk spreading and; risk and return); and attitudes (propensity to save, time preferences and risk preferences). In 2015, this questionnaire was used to measure the degree of financial literacy in thirty (30) countries worldwide.

The Standard and Poor Global Financial Literacy Survey (2014) is the most comprehensive worldwide assessment of financial literacy. More than 150,000 adults in over 140 countries were interviewed in the survey. It elicits responses in four (4) fundamental aspects namely: numeracy skills, risk spreading, inflation, and compound interest. This study uses the S&P Global estimate of financial literacy because it is currently the most comprehensive database. Its measure financial literacy as the percentage of adults of a population who are financially literate in a country.

2.2.2.5 Theories of Financial Literacy

2.2.2.5.1 Self-efficacy Theory

Two theories that can be employed to expound financial literacy are the self-efficacy theory by psychologists Bandura (1997) and the goal setting theory by Locke and Latham (2002). Self-efficacy talks about confidence in one's ability to effect behaviour required to produce performance attainments (Bandura, 1977, 1986, 1997). It reflects belief in the ability to exercise control over one's own motivation, behavior and social environment. To Bandura, one's belief in the ability to excel in specific undertakings or achieve a mission influences how one approaches goals, tasks and challenges. This ability covers the cognitive, social and emotional aspects of an individual to perform specific tasks. Relative to financial literacy, this theory recounts how

consumers manage their capacity to comprehend and appreciate financial instruments to be knowledgeable about a wide array of dynamic innovative products.

According to Bandura (1997), self-efficacy emanates from four sources namely: mastery, modeling, persuasions and physiological factors. Mastery refers to having a firm grasp of a subject which leads to success. When success is achieved the individual is motivated to attempt it again and have additional successes. In the context of financial literacy, when one has a good understanding and knowledge about financial products/services, the person will be motivated to use them. Once they become successful in applying the financial capabilities that they possess, they will develop the confidence to use the financial products/services again.

Modeling refers to learning based on modeled behaviour. When one observes people similar to oneself succeed, it encourages observers that they too can master the capabilities to succeed in comparable activities. In the setting of finance, when one models a successful management of finances, it can motivate others to demonstrate that they too can succeed in managing their finances.

Verbal/Social persuasions refer to feedback from undertaking an activity. Feedback from peers and influential people can strengthen the beliefs of others that they have what it takes to succeed. In the framework of financial literacy, giving positive feedback when financial behavior is modeled will encourage one to acquire more knowledge about financial products or concepts and increase the use of these services. This is so because positive verbal persuasions improve confidence to practice a learnt concept.

Physiological and emotional state refer to the state an individual is at a period of time. This emotional state affects how they assess their self-efficacy. For instance, negative emotions like stress and depression can dampen an individual's confidence in their capabilities while positive emotions can boost confidence in one's skills. These emotions stem up from one's financial and physical state. From the perspective of finance, when people have their basic financial needs met by the formal financial system, they are more enthusiastic to learn the basics of what they use and hence, promote financial literacy. On the other hand, anxiety about financial products will hamper the interest to learn more about financial products and services. The self-efficacy theory which relates to the motivation to manage finances and use financial products can be used to explain the influence of financial literacy on other decisions.

2.2.2.5.2 Goal Setting Theory of Motivation

Locke and Latham (2002) goal setting theory highlights the relationship between goals and performance. This theory asserts that goal setting is associated with performance of a task and that precise and challenging goals along with other apposite feedback contribute to greater and improved task performance. The goal setting theory presumes that an individual is dedicated to a goal and will follow through it until it is achieved. Locke and Latham (2002) clarified that motivation relates to direction, level of effort (magnitude) and persistence of behaviour. However, if one lacks the abilities and competencies to execute actions vital for a goal, then the goal setting may not be successful and lead to reduced performance.

Relating this to financial behaviour, goal setting is a crucial element of financial planning. Hogarth and Angelov (2003) examine the association between motivation and financial literacy and find a positive link between deprived households with small amount of savings and low motivation. The study by Mandell and Klein (2007) establish that motivation improves financial literacy skills. Their argument is that motivation shapes the behavior of people in managing their finances which tends to improve the knowledge about financial activities thereby improving financial literacy. Financial behaviour of individuals include setting financial goals; estimating costs and revenues accurately; planning and budgeting. It also includes considering options when making financial choices; adjusting to meet unexpected financial need; paying financial obligations on time; achieving financial goals; and implementing spending plans successfully (Heck, 1984). In sum, the goal setting theory of motivation emphasizes committing to specific financial goals and planning to achieve them.

2.2.3 Theoretical Literature on Inclusive Growth

2.2.3.1 Definition and Measurement of Inclusive Growth

Inclusive growth emerged from the discussions of sustainable poverty reduction (Stuart, 2011) and pro-poor growth (Kakwani & Pernia, 2000). Pro-poor growth is either absolute or relative. The focus of absolute pro-poor growth is improving the income of the poor as the economy grows without paying attention to changes in inequality (Ravallion, 2007). Kakwani and Pernia (2000) emphasize relative pro-poor growth where earnings of poor people increase higher than the non-poor as mean earnings increases. One of the main differences between pro-poor growth and inclusive growth is that while pro-poor growth considers the welfare of those whose wealth is under the poverty line, inclusive growth embraces everyone in the whole welfare distribution

(Klasen, 2010). Kakwani and Pernia (2000) further conceptualize inclusive growth as involving both participating in and benefitting from growth, where benefit refers to outcome and participation refers to process.

Growth is said to be inclusive when all members of the working population contribute to and benefit from it equitably. Inclusive growth emphasizes that economic growth should reach the most vulnerable people in any society, create employment opportunities for all and help reduce poverty. The parity of opportunity and the participation in growth by everyone with particular emphasis on the working underprivileged are the basic tenets of inclusive growth. The OECD (2013) defines inclusive growth “as economic growth that creates opportunity for all segments of the population and distributes the proceeds of economic growth, both in monetary and non-monetary terms, equitably across society”. The focus of inclusive growth is to analyze the degree to which GDP growth enhances the welfare of the citizenry and how they contribute to the growth process.

The OECD approach inclusive growth from a multifaceted outlook that covers both income and non-income aspects such as education, health, life expectancy, employment prospects, income inequality and governance. Klasen (2010) explains inclusive growth as “growth process that ensures equal access to opportunities for all segments of society regardless of their individual circumstances”. To achieve inclusive growth, there should be growth accelerators and growth spread which make the process more equitable. In addition, it emphasizes both the pace and pattern of growth because how growth is created is crucial for poverty reduction (Ianchovichina & Lundstrom, 2009).

The inclusive growth debate has progressed through the works of multilateral and regional agencies as well as individual contributors. These include the World Bank, UNDP, OECD, ADB, AfDB, Ali and Son (2007); McKinley (2010) and Anand et al. (2013). The discussions on inclusive growth from the perspectives of these contributors are appraised in the following subsections.

2.2.3.1.1 World Bank's (WB) Perspective

World Bank (2015) defines inclusive growth as growth that is broad based across sectors and all-encompassing a great percentage of a country's labour force for which people contribute to and benefit from it. It emphasizes both the pace and pattern of growth with focus on access to and fairness of opportunities available which are intertwined and has to be addressed together. This definition is consistent with that of Spence (2008), that inclusiveness cover fairness, equality of opportunity, protection in markets and employment. Also, inclusive growth focuses on productive employment instead of direct earnings redistribution as a method of improving the earnings of marginalized people. WB's definition of inclusive growth suggests a direct connection between the macro and micro factors of growth and captures the relevance of organizational modification to expand economic and competitive advantages in a country (Ianchovichina & Lundstrom, 2009).

The WB's approach to inclusive growth is aligned to the absolute definition of pro-poor growth and its key pillars are productive employment, poverty reduction and economic growth. The indicators include cost of finance (sources of finance- domestic savings and financial sector intermediation) and gains from economic activity (social returns and private appropriability). These indicators were adapted from the Hausmann, Rodrik, and Velasco (2008) known as the HRV

approach which suggests that employment growth creates new occupations and earnings for the citizenry – from self-employment or wages from firms while productivity growth is likely to increase the incomes of those employed and the gains to the self-employed. However, the ability of individuals to find gainful employment is contingent on the opportunities available to use existing resources as the economy changes. Hence, the focus is to reinforce the productive resources and abilities of individuals on the supply side and to promote opportunities for productive employment on the demand side. The HRV framework was applied to a study in Zambia which found that poverty rates did not reduce much in spite of improved and stable growth achieved because there was a huge untapped potential in agriculture, mining and service.

In the view of the WB, inclusive growth can be achieved by “focusing on expanding the regional scope of economic growth; expanding access to assets and thriving markets; and expanding equity in the opportunities for the next generation of citizens irrespective of where they live” (World Bank, 2015 p.16). The main challenge to the WB’s approach to inclusive growth is that it is more aligned to the poor benefiting from growth instead of also contributing to it.

2.2.3.1.2 United Nations Development Programme (UNDP) Perspective

The UNDP defines inclusive growth as “the process and the outcome where all groups of people have participated in the organization of growth and have benefited equitably from it”. Thus, inclusive growth represents an equation – with organization of growth on the one hand and benefits on the other hand (Suryanarayana, 2008). UNDP highlights inclusive growth as growth that

focuses on reducing inequality, promoting economic growth and ensuring political participation of deprived people in the growth process and benefitting from it. Suryanarayana (2013) asserts that the implicit objective of inclusive growth is to follow a policy that caters for the inclusion of the marginalized groups in the formal economy; and the growth process should emphasize changes in income/consumption based deprivation measure. Inclusive growth connotes that the underprivileged benefits from growth and also participate effectively in the growth process to experience welfare expansion as measured by their consumption.

The UNDP uses a conventional approach based on welfare enhancement in terms of mean-based income and consumption to measure inclusive growth and suggests the use of other mean based indicators to measure the concept. The measure of inclusive growth focuses on improving production, generating income and distributing it. It asserts that using all the three areas of the growth process to measure the concept pose a challenge due to lack of comprehensive data. Therefore, it used the household consumer expenditure distributions to estimate three measures. The first of the consumption based measures is the elasticity of mean consumption with respect to average income which indicates from an economic viewpoint if growth in income is inclusive. The argument is that if growth in income is skewed towards the top, mean consumption would not rise at an equivalent rate and mean income would be less than one.

The second is the elasticity of median consumption with respect to mean consumption. When the value for the mean consumption is greater than 1, it suggests a situation getting close to broad based growth. Inclusive coefficient for consumption distribution is the third measure. This measures the ratio of lowest half of the population relative to per capita income in the mainstream. The coefficient lies between 0 and 1, it is 0 when a section of the population is not included in the

mainstream and 1, otherwise. These measures assume that there is a well-integrated market where both consumers and producers operate and face identical economic environment. One limitation of the mean consumption approach is that it is not a robust measure because the household income or consumption may be skewed and this can give a misleading outcome. Secondly, it measures only a part of inclusiveness as the participation or employment aspect is not considered.

In addition, Suryanarayana (2008) argues that negative covariance between mean-based averages of income/consumption and incidence of poverty do not give sufficient basis of inclusion. This is so because time series measures of absolute poverty given by the ratio of population living below the subsistence minimum which is kept invariant give little information about the extent to which the condition of the poor changes with the growth process. One limitation of this approach of measuring inclusive growth is that measures of deprivation focus more on income aspect neglecting the non-income aspects. Also, welfare measures such as incidence of poverty are not very robust.

2.2.3.1.3 Organisation for Economic Co-operation and Development (OECD) Perspective

OECD (2011) explains inclusive growth as growth that generates opportunities for all groups in a society and distributes the gains from growth (monetary and non-monetary) equitably among the population. Generally, the gap of inequality between the rich and the poor has not narrowed in many countries with those at the top having a greater share of the proceeds from growth than those at the bottom. The OECD emphasizes multidimensionality of the concept, distribution and policy relevance. The multidimensional nature acknowledges that well-being is not only based on income and wealth but includes other aspects such as education, employment opportunities, life

expectancy, governance and other socio-economic indicators. The main tenets of OECD on inclusive growth is that inequalities of income should be reduced and opportunities and proceeds of economic growth must be equitably shared. It is about reorganizing the resources of an economy so that more people can participate in and benefit from economic growth. Hence, at the heart of inclusive growth is an enhancement of standard of living of a target income group or representative household in a society in all facets of life.

OECD uses a three-component measure of inclusive growth based on its three main pillars. It places emphasis on distribution and policy relevance. The multidimensionality draws insights from the welfare framework as shown in “How’s Life” by Boarini, Murtin, and Schreyer (2015) where a set of eleven income and non-income indicators are identified. These include income, health, quality of environment, education, security, jobs and social ties. The distributional aspect of inclusive growth focuses on combining an identified representative household, and aggregated income and non-income outcomes into a single measure of overall living standards that can be used to assess policy alternatives (Boarini et al., 2015). The third component establishes a causal link between policies and outcomes in various areas of the economy. The OECD’s approach to measuring inclusive growth was applied to 18 of its member countries for the period 1995-2007. The study finds that all the measures of multidimensional living standards showed improvement which suggests that inclusive growth persisted.

2.2.3.1.4 Asian Development Bank (ADB) Perspective

To ADB, inclusive growth emphasizes that growth should not discriminate against marginalized groups but rather reduce disadvantages in all segment of a society. Its working definition of

inclusive growth “is growth that allows participation and contribution by all members of society, with particular emphasis on the ability of the poor and disadvantaged to participate in growth (the nondiscriminatory aspect of growth) and associates with declining inequality in non-income dimensions of well-being that are particularly important for producing economic opportunities, including education, health, nutrition, and social integration (the disadvantage aspect of inclusive growth)” (Klasen, 2010). To this view, inclusive growth entails improvement in per head income for the citizenry of an economy with emphasis on underprivileged groups. This is indicative that all categories of people in an economy are able to contribute to growth equitably based on opportunities available. It also suggests an absolute expansion of no-income aspects of welfare that is above the mean rate for the marginalized since this ensures that growth is disadvantaged-reducing. The core of Klasen’s definition of the concept is that growth should offer equal economic opportunities for all in a society (Ali & Zhuang, 2007).

ADB’s framework for measuring inclusive growth is made up of thirty-five (35) indicators under five components. These are i. poverty and inequality (3 indicators for income and 3 indicators for non-income); ii. expansion of economic opportunity (5 indicators for expansion and 4 for key infrastructure endowments); iii. social inclusion to ensure equal access to economic opportunity (6 indicators for access and inputs to education and health; 4 for access to basic infrastructure utilities and services; and 4 indicators for gender equality and opportunity); iv. social protection (3 indicators); and v. good governance and institutions (3 indicators). The role of these 35 indicators to achieving inclusive growth has been analyzed in some OECD countries and the finding is that each of the indicators play a significant role to achieving inclusive growth, though a composite measure is yet to be operationalized.

2.2.3.1.5 African Development Bank (AfDB) Perspective

Note (2012) conceptualizes inclusive growth as “economic growth that results in a wider access to sustainable socioeconomic opportunities for a broader number of people, regions, or countries, while protecting the vulnerable, all being done in an environment of fairness, equal justice, and political plurality”. In effect, growth should benefit a larger segment of the society. In its view, inclusive growth strategies should emphasize the importance of focused and systematic poverty eradication. It argues that inclusive growth should focus on income and non-income components of growth. In addition, growth should be seen as an outcome (improved life/income and accessibility to amenities) and a process. AfDB views inclusive growth as having four pillars namely – economic, social, spatial and political/institutional inclusion.

To measure the concept, AfDB computes a single index by applying a geometric mean approach using economic and social indicators that are extension of those used to compute the HDI to get a more holistic measure. The indicators used cover GDP growth, gender, sanitation, health and demographics, inequality, labour force and employment, governance and education. The specific indicators are: real GDP growth, real per capita GDP growth, public health expenditure (%GDP), mortality rate under five (per 1000), life expectancy at birth, Tuberculosis (per 100,000 people), wage and salaries (% of total employment), employment to population ratio (% of 15+), female labour force (% of total workforce), ratio of female to male secondary enrolment (%), population using improved sanitation facilities (%), Gini index and corruption perception index.

To compute the index, a country's ranking obtained for a range of indicators is normalized to get a score between 0 and 100. An average of a period is used to smoothen out annual fluctuations in individual ranks and this is repeated for all indicators except inequality. The overall inclusive scores for each country are computed as a geometric mean for that country of the standardized values for different indicators using the formula:

$$IG_i = \sqrt[n]{S_{1i} * S_{2i} * \dots * S_{ji}} \quad (1),$$

where:

$i = 1, 2, \dots, m$: country i included in the dataset;

$j = 1, 2, \dots, n$: indicator j included in the dataset

m = number of countries; 153 and n = number of indicators in the dataset; 14

S_j denotes standardized score for the rankings obtained in respect of indicator j for country i .

Standardized scores are obtained using the formula (for indicator for each i):

$$S_{ji} = 100 * \frac{m_j - r_j}{m_j - 1} \quad (2),$$

where: r_j is a country's rank in respect of indicator j in ascending order of magnitude and m is the total number of countries for indicator j . The intuition behind equation (2) is to standardize the scores. Standardized scores take a value between 0 and 100. The formula is applied to each indicator for each country.

This process is applied to compute an index for inclusive growth for countries in North Africa for 2000-2002 and 2008-2010. The index is compared to some countries in the Middle East and other

least developing countries. A sensitivity analysis of the thirteen (13) indicators used to compute the index shows that the employment indicators had the greatest effect in all countries sampled. It finds that North African countries underperformed internationally and over the years, the trend improved at varied degrees for countries. One challenge with the geometric approach is that it is sensitive to outliers and this may affect the final value of the index.

2.2.3.1.6 Contributions by Other Researchers

Apart from the views of the multilateral and regional agencies on inclusive growth, other individual studies that have assessed the concept of inclusive growth and its measurement include Ali and Son (2007); Klasen (2010); Anand, Mishra, and Peiris (2013); Adedeji, Du, and Opoku-Afari (2013); and Ramos and Ranieri (2013).

Ali and Son (2007) add to the discussion by explaining inclusive growth as growth that creates new opportunities and creates equivalent access to opportunities to the varied groups of people in an economy. To Ali and Son (2007), three key elements are vital to achieving inclusive growth. These are generating increased employment opportunities and productivity; equipping the labour force with skills through education and improved health; and offering some protection or buffer to vulnerable groups. They use the social opportunity function which is akin to the social welfare function to measure inclusive growth where inclusive growth maximizes the social opportunity function. This suggests that on average the marginalized in a society have increase access to opportunities and benefits more in the distribution of these opportunities. Therefore, an increase in the social opportunity function indicates inclusive growth.

By this measure, growth is more inclusive if opportunities are shifted towards poorer groups in a society and this increases the social opportunity function. The slope of the curve gives an indication of the pattern of inclusive growth. An outward shift, indicates growth is distributed equitably among all the segments of the population. If it slopes down downward, it suggests that opportunities to the marginalized are less than those to the privileged. Hence, the extent of inclusive growth depends on the direction of the movement of the opportunity curve and where income distribution occurs. One limitation of the social opportunity function is that it cannot estimate the exact extent of change in the opportunities that have occurred over time. One approach that has been used to address this limitation is to calculate an index based on the region under the social opportunity curve known as the equity index of opportunity. If this index is greater (lesser) than 1, it suggests that opportunities are equitably (inequitably) distributed. It must be noted that the equity index of opportunity is not based on indicators but rather describes the process used to achieve an end. Ali and Son (2007) focus extensively on the non-income component of inclusive growth but did not examine how the income component contributes to inclusive growth.

Klasen (2010) offers a theoretical approach to evaluating inclusive growth. He explains the concept as growth that gives equivalent access to opportunities to all and reduces disparities of disadvantaged groups. He adds that inclusive growth has income and non-income growth components. Klasen argues that when all members of a society participate and contribute to the process of growth such that the poor and disadvantaged groups are not discriminated against but get fair earnings then inclusive income growth has been achieved. On the non-income component, growth is considered inclusive when there is declining inequality in the provision of social

amenities like health, education, nutrition and social integration and nutrition. These are very relevant for promoting economic opportunities.

From the explanation of inclusive growth by Klasen (2010), it suggests that inclusive growth requires increased growth rates in per capita income especially for the disadvantaged group which is an indication that the marginalized contributes to growth. Secondly, there should be expansions of social amenities - education, nutrition; transport, communication, clean water and electricity - which should exceed the average growth rates for disadvantaged groups.

To measure inclusive growth, Klasen (2010) adopts the poverty-equivalent growth rate approach proposed by (Kakwani & Son, 2008) and originally used to measure pro-poor growth. Klasen (2010) applied it to measure inclusive growth rate for a disadvantaged group. It is given by $IG_{ij} = (G_{ij} / G_j) * G_j$, where i denotes specific marginalized group; and j denotes the indicator of interest, for instance improvement in health or income growth. One set back about this measure of inclusive growth is that it is limited to only the disadvantaged group in society instead of the entire society. This seems to suggest that pro-poor growth and inclusive growth are the same which is not the case.

Anand et al. (2013) suggest a measure of inclusive growth that is consistent with the absolute definition of pro-poor growth and use a macro social mobility function that follows the literature on income distribution. Their approach integrates equity and growth which is built on a utilitarian social welfare function based on consumer decisions. Here, inclusive growth hangs on income

growth and allocation. This is akin to consumer theory where indifference curves denote the changes in aggregate demand over time and decomposes the income and substitution effect into growth and distributional components. The social welfare function must be rising in its argument to reflect growth component and also satisfy the transfer property, that is any shift of income from the poor to the rich shrinks the value of the function which captures the distributional component.

The measure of inclusiveness follows a concentration curve as presented by Ali and Son (2007) where the populace is arranged in ascending order of their incomes called the social mobility curve. A higher curve suggests greater mobility and growth is deemed inclusive if the social mobility curve moves upward at all times. Nonetheless, how the curve moves (growth) and how the shape of the social mobility curve changes over time (distribution of income changes - equity) suggest the degree of inclusive growth. It must be noted that if two concentration curves do not traverse, they could be ordered on social mobility to indicate inclusive growth. Anand et al. (2013) summarized their measure of inclusiveness in the following matrix:

Table 1: Measure of Inclusiveness by Anand et al. (2013)

Average income growth) (Income	Equity (Income distribution)	Interpretation
$d\bar{y} > 0$	$d w > 0$	Unambiguously Inclusive
$d\bar{y} > 0$	$d w < 0$	Greater per head income at the expense of equity (could be inclusive if percentage change in $\bar{y} >$ percentage change in w)
$d\bar{y} < 0$	$d w > 0$	Equity objective is achieved at the cost of average income contraction
$d\bar{y} < 0$	$d w < 0$	Unambiguously noninclusive

Note: Where $d\bar{y}$ refers to average income growth and $d w$ refers to equity or income distribution. These two variables are considered together to give an indication of the level of inclusive growth.

One of the limitations of measuring inclusive growth using the social mobility function is that non income component of growth is not accounted for.

Similar to Ali and Son (2007) and Anand et al. (2013), Adedeji et al. (2013) used the social opportunity function that is based on social welfare function to measure the inclusiveness of growth. They focused mainly on access to health and education as key conduits that enable economic agents to participate in the growth process. By their measure, inclusive growth is correlated with greater opportunities open to the society and enhanced allocation of these opportunities. They applied this measure to selected African countries and find that high aggregate growth rates over the last ten years led to improved prospects in education and health yet the

allocation of the opportunities was different across countries based on individual country-specific strategies that promoted the growth.

Adedeji et al. (2013) contribute to the discussion of inclusive growth by defining it “as the maximization of the social opportunity which depends on increasing average opportunities available to the population and distributing the available opportunities equitably among the population”. Here, the social opportunity function emphasizes the opportunities given to the underprivileged and stresses that priorities to the poor should be greater compared to the not so poor. Clearly, Adedeji et al. (2013) explanation of inclusive growth is more aligned to relative pro-poor growth which is postulated by Kakwani and Pernia (2000). Relative pro-poor growth arguably is only an aspect of inclusive growth.

Other contributors to the inclusive growth debate are Ramos, Ranieri, and Lammens (2013). They explain inclusive growth as a process that considers fair sharing of gains from growth and full contribution of society to the growth. Ramos et al. (2013) analyzed inclusive growth at two levels: distribution of benefits and contribution to the creation of the benefits. Distribution of benefits aspect examines if growth brought about a decline in income poverty and inequality. It also focuses on whether the growth rate of income of the poor exceeds that of the mean income of the population. The contribution aspect investigates the extent of involvement of the population in the generation of growth. It also pays attention to how growth is creating jobs for the active group of a society.

Ramos et al. (2013) analyze the degree of inclusiveness in forty-three (43) developing countries by using three indicators that relate to poverty, inequality and employment. In their analysis, they first examine the benefit-sharing component of inclusive growth by comparing income inequality and poverty indicators for two periods. They find that only few countries with middle inequality level managed to reduce income inequality significantly while countries with poorest allocation of income were not able to reduce inequality. Others encountered a widening gap in income distribution. In relation to poverty, they find that though many countries poverty levels reduced, it is still a major issue in most developing countries.

When the analysis combines income inequality and poverty to observe the direction but not the intensity, they find that sixteen (16) countries reduced both poverty and inequality of the variations that have occurred and have achieved the expected economic outcome of inclusiveness in the benefit dimension. Though, poverty reduced in seventeen (17) countries inequality increased hence, growth was not inclusive. Nine (9) out of the forty-three (43) countries experienced increased poverty ratio and five (5) out of these have increased both poverty and inequality levels. This clearly shows that these countries have not exhibited inclusiveness in their growth process because poverty incidence in most countries in Sub-Sahara Africa is high and around 65%.

Ramos et al. (2013) analyze the participation dimension by comparing employment to population ratio (ETPR) for two time periods. They find that the populace of a country could participate to a great extent in economic activities that lead to growth but do not earn a commensurate return for their labour. Hence, the populace does not have enough funds to access basic goods and services. For this reason, very high ETPR may not be considered optimal for inclusiveness. Similarly, a country with low ETPR may not necessarily be considered as positive or negative. It is possible to

have a country with high ETPR and have high poverty rates while another will have high ETPR with low poverty rates.

The ILO (2011) posits that ETPR below 60% suggests the malfunctioning of the labour market. Also, ETPR greater than 60% is not the best as it is mostly strongly associated with a number of working poor. Ramos et al. (2013) propose that poverty level should be considered alongside an evaluation of ETPR. Their study shows that growth is inclusive when it reduces inequality and poverty and also lead to greater employment.

Other authors have also proposed different methods of measuring inclusive growth with the focus being either on opportunities or outcomes or both. The key element of interest is what to measure and how to measure it. While some authors argue that the focus of measuring inclusive growth should be on opportunities instead of outcomes (Adedeji et al., 2013; Ferreira, Gignoux, & Aran, 2011); others are of the view that a measure of inclusive growth should include both outcomes and opportunities (Ianchovichina & Lundstrom, 2009; Klasen, 2010). Arguably, it is much easier to measure or observe people's income than to measure what they are capable of earning. However, since there are other non-income components of welfare, it is worth considering both outcomes and opportunities.

2.2.3.2 Relevance of Inclusive Growth

Over the years, growth in GDP has not always resulted in reduction of poverty, inequality and increased the standard of living that had been expected. Hence, a more up-beat approach is required to ensure that the gains from growth is fairly shared in a society. One relevance of inclusive growth

is that it has a potential to reduce the high unemployment levels in Africa. ILO (2016) estimates that the unemployed rate in the Africa stands at 13.1%. In addition, World Bank projects that the youth in Africa is likely to grow by 42.5 million between 2010 and 2030. With growing young labour force, growth needs to be inclusive to promote access to quality employment for all since inadequate employment opportunities can destabilize social cohesion and political stability. Secondly, inclusive growth needs to be rigorously and aggressively pursued to lift a great number of underprivileged from poverty and promote diversified growth. Also, pursuing inclusive growth will promote empowerment, security, social inclusion, and sustainable and equitable growth in Africa.

2.2.4 Role of Financial Institutions in Financial Literacy and Financial Inclusion

Financial institutions play a vital role in the economic development of economies through the services they offer. Financial institutions that can promote financial inclusion include commercial banks, pension funds, micro-finance institutions, insurance companies and the central bank. Commercial banks facilitate the mobilization of financial resources and channel them through productive purposes to achieve capital formation. Though commercial banks do this by providing services such as offering a platform for borrowing, savings and payment system, insurance and investment yet, most of the services offered have been out of reach of the poor and vulnerable since the services are relatively highly priced and sometimes out of reach by distance. This makes a number of people especially the vulnerable group fall outside the formal financial system. Inadequate access to the formal financial products is mostly due to limited bank branches especially in remote areas and unwillingness of banks to serve the poor group in society (Birla, 2016).

Also, the low income population do not seem to understand the benefits of mainstream financial products and so they shy away from them. Raihanath and Pavithran (2014) assert that some of the roles commercial banks can perform in achieving financial inclusion include: counselling; mobile banking; financial literacy; branch expansion and ‘No-frill account’; offering appropriate products such as micro-credit and small savings accounts to attract the unbanked into the banking system.

Similarly, Micro-finance institutions can also play a role by meeting the needs of those groups that cannot access the services of commercial banks. Micro-finance provides relatively small credits to disadvantaged and marginalized groups to extend or develop income generating activities to take them out from poverty. Arguably, the activities of micro-finance institutions enable disadvantaged groups to engage in economic ventures that enhance income generation, creation of employment and improved well-being. Corrado and Corrado (2017) assert that microfinance institutions (MFIs) serve as an avenue for lending to disadvantaged groups and bridge the gap between that formal financial sector and individuals or small businesses that are seeming riskier and not served by commercial banks. MFIs have been identified as agents for increasing efficiency, depth and accessibility of the financial systems as MFIs offer financial services to the poor (CGAP, 2012). Often, MFIs is applied to developing countries like Africa as low-rate finance using unique systems of group lending, giving credits to consumers with virtually no collateral but with social capital in the form of peers who are also co-applicants and in many cases held jointly liable. This enables the marginalized to be empowered and to gain control over their lives (Biasharaleo, 2017). MFIs can play a key part in financial intermediation by mobilizing money with individuals who do not have access to financial services in the mainstream sector and channeling them into loans.

MFIs become a good avenue to shore up the number of people who access financial products. In addition, as MFIs meet the financial needs of the poor households, this avenue can be a channel to offer financial knowledge to the poor which is likely to improve their inclusion into the formal financial system. In addition, if the poor are financially literate they are likely to access credits that they have the capacity to pay.

To achieve sustainable development of Africa economies, access to financial products/instruments to the adult population is necessary. One way to accomplish this is to explore the potential of the insurance sector. Insurance companies have a critical role to play by monitoring risks and offering protection against these risks. According to the World Bank Group (2013), access to insurance services worldwide is low with developing countries having about 17% of the adult populace undertaking health insurance. In Africa, only between 3% - 5% adults have access to health insurance which poses a high insurance gap because a greater share of the populace that lives under the poverty line do not have insurance.

Suedekum (2016), identifies insurance as a vital pillar of financial inclusion because insurance is a critical aspect of bringing about financial inclusion by providing a cushion in times of financial vulnerability and shocks due to natural occurrences or financial burden due to health challenges. Insurance products can make a positive impact in the life of the vulnerable individuals by helping households to mitigate shocks and improve the management of expenses related to unforeseen events such as the death. In addition, insurance companies can educate the population through financial literacy programmes to create awareness about insurance products/services and the need

for an insurance cover especially for the poor. Proper education and development of appropriate services to cater to the needs of the deprived is likely to whip their interest in insurance products.

Articles 22 and 25 of the UN Universal Declaration of Human Rights affirm that social insurance is a fundamental human right. To achieve this human right, pension institutions acting as a channel of financial inclusion can play a role. Thus, pension and social security institutions/activities are catalyst to financial inclusion. Pension institutions can support financial inclusion by filling the saving gap by providing an avenue for the working population to save, invest and build up funds for retirements. The primary objective of pensions and social security is to provide funds for the working population that would prevent them from being poor and dependent in old age. World Bank (2017) indicates that the world's population is aging rapidly and only one in nine workers contribute to a pension programme in low income nations while in middle income nations there are large gaps for lower-income and informal sector workers. In Africa, mandated pension coverage is as low as 22% with only a very few people in the informal sector saving formally or informally towards their retirement.

A related concern is that the average age gap between credit age caps and life expectancy is fifteen years which suggests that many people live for over 15 years without being able to access credit. In addition, less than 50% of older people in developing countries operate an account at a mainstream financial institution (www.helpage.org). Social security and pension institutions can tackle these challenges through a conscious financial literacy programmes to enhance financial inclusion to help reduce poverty among the elderly. Basic financial knowledge is necessary to safeguard the interest of pensioners as it can enable them to plan ahead to enjoy a more predictable and adequate income during life after their working lives.

Finally, the role the central bank can play in achieving financial inclusion through financial literacy cannot be overemphasized. Policy makers have an influence on how the masses who lack access to basic financial services can be integrated into the formal financial system. Policy makers need to create the environment for financial inclusion through policies, regulations and establishing long term national strategy to achieve this. For instance, proper regulation of the electronic payment system is likely to motivate the population to hold mobile financial services (Schlein, 2016). Also, to ensure full financial inclusion, the central bank needs to set the appropriate framework where financial institutions can adopt strategies to foster financial inclusion. Dabla-Norris, Deng, Ivanova, Karpowicz, Unsal, VanLeemput, and Wong (2015) show that the government through the central bank plays a pivotal role in expanding the reach to financial services and promulgating regulations that safeguard the rights and assets of creditors as well as implementing the laws in appropriate ways.

2.2.4 Review of Empirical Literature

2.2.4.1 Financial Inclusion and Inclusive Growth

There is a budding literature on different aspects of financial inclusion as well as inclusive growth studies. Generally, research on financial inclusion have focused mainly on conceptual definition (Chakravarty & Pal, 2010; Demirguc-Kunt & Klapper, 2012; FATF, 2013); measurement (Ambarkhane, Singh, & Venkataramani, 2016; Beck, Demirguc-Kunt, & Honohan, 2009; Demirguc-Kunt & Klapper, 2013; Gupte, Venkataramani, & Gupta, 2012; Sarma, 2008); and country level based analysis of financial inclusion. Fungáčová and Weill (2015) used survey data

to analyze financial inclusion in China while Sinha (2013) considered it from the Indian perspective.

For inclusive growth, studies have been on the concept of inclusive growth (Ramos, Ranieri, & Lammes 2013; CAFOD, 2014; Hounghonon, Bauer, Ndiaye, Champagne, Yokossi, Ferrière, & Avril, 2014; Ianchovichina & Lundstrom, 2009; Rauniyar & Kanbur, 2009). Others focused on measures, determinants and indicators (Ali & Son, 2007; Anand, Mishra, & Peiris, 2013; Asghar, 2012; Klasen, 2010; McKinley, 2010). On the connection amid financial inclusion and growth, Levine (2005) asserts that the bulk of existing research on the topic advocates that countries with strong performing financial structures reduce the foreign financing limitations that hinder business growth. This suggests finance is crucial to achieve growth.

There is paucity of research on the interconnection between financial inclusion and inclusive growth. Some works have investigated the relationship between financial inclusion and economic growth/development. For instance, Kim, Yu, and Hassan (2018) examine the correlation between financial inclusion and economic growth in fifty-five Organization of Islamic Cooperation (OIC) countries using a panel VAR and find that financial inclusion impacts economic growth positively. Similarly, Kim (2015) assesses the influence of financial inclusion on income inequality and economic growth among forty (40) countries in the OECD and European Union and finds that inequality has a harmful impact on economic growth and this is sturdy in low-income countries. The study further finds that financial inclusion narrows the inequality gap and augments economic growth. Other research confirm that the degree of financial sector development is vital in stimulating economic growth (Levine, Loayza, & Beck, 2000; Levine & Zervos, 1998; Rajan & Zingales, 1998).

In relation to Africa, Inoue and Hamori (2016) investigate the connection between financial access and economic growth in some Africa countries and find that financial access greatly influences economic growth positively. Babajide, Adegboye, and Omankhanlen (2015) also examine the relationship amid financial inclusion and economic growth in Nigeria using ordinary least squares and report that financial inclusion is an important determinant of total factor of production which determines the degree of output in an economy. The evidence from the research on the nexus between financial inclusion and economic growth suggests that financial inclusion improves economic growth.

Not much work has explored the link between financial inclusion and inclusive growth. Some studies on financial inclusion and inclusive growth include the work of Park and Mercado (2015) that examine the relationship between financial inclusion, poverty and inequality in Asia. It finds that financial inclusion reduces poverty and inequality. Dhillon and Mittal (2016) also examine the relevance of financial inclusion for inclusive growth in the Indian context while Migap, Okwanya, and Ojeka (2015) investigate financial inclusion for inclusive growth from the Nigerian perspective. The results of these works show that the depth of financial inclusion is shallow despite some initiatives the countries have undertaken to improve financial inclusion. However, it is not clear from the studies how financial inclusion impacts inclusive growth. There is paucity of empirical study on the relationship between financial and inclusive growth in general and especially in Africa. A study by Ajide (2015) in Nigeria indicates that financial inclusion make up an important part in poverty reduction and redistribution of income in developing countries.

Chibba (2009) asserts that financial inclusion complements strategies to address poverty. Chibba (2009) further argues that the deprived with low income in developing countries can enhance their well-being through financial inclusion. This is so because financial inclusion enables the poor to better manage their finances; have access to funds at affordable cost and provides a safe avenue for savings. Other studies also suggest that financial inclusion can reduce poverty and stimulate pro-poor growth (IFPRI, 2007; Chibba, 2008; World Bank, 2008; Setboonsarng & Parpiev, 2008). Similarly, The UK White Paper on International Development (2009) links access to financial services with poverty reduction. It argues that access to financial products empowers the masses especially the deprived to improve their lives. Further, it has been established that poverty hinders financial inclusion (Collard, Kempson, & Whyley, 2001; DWP, 2001; Carbo, Gardener, & Molyneux, 2007) and this tends to fuel increased poverty. This gives indication that for poverty to be reduced, financial inclusion needs to be aggressively pursued. It is envisaged that as an inclusive financial system gives the bulk of the populace reach to diverse financial services that meet their needs and usage of these financial services will enable the beneficiaries to embark on productive ventures to improve their lots. Hence, financial inclusion can be a relevant poverty fighting tool. As poverty reduces, the group of the populace that was involuntarily excluded from the financial system as a result of low income will be integrated into it.

Arguably, inclusive growth seeks to achieve equitable distribution of growth and this cannot succeed without financial inclusion because finance is a vital aspect of growth as it shapes the distribution of economic opportunities. Financial inclusion is therefore a central part of inclusive growth which has a high tendency to reduce poverty. The major way financial inclusion can lead to inclusive growth is to make finance available to those who were not previously integrated into the financial system to undertake productive economic venture.

It must be emphasized that people are poor not because they do not engage in any economic activity but because the economic activities they engage in are not productive enough due to lack of or inadequate finance to support and expand those activities. Financial access and usage have the tendency to improve their lots, increase their wages and also enable them to contribute to growth. Economic theory submits that productivity growth should increase the bargaining power of labour and propel household income which will reduce income poverty and narrow the income inequality gap. It can be argued that productive employment due to access to finance is one of the conduits through which inclusive growth can be achieved. Some of the channels in the literature include credit unions (Fuller, 1998); Mobile Money (Donovan, 2012) and ICT (Kpodar & Andrianaivo, 2011).

From the foregoing discussions, it is evident that not much work have empirically investigated the connection between financial inclusion and inclusive growth. Secondly, research work that have examined this relationship in Africa focused on individual countries. In addition, some research paid attention only to some aspects of financial inclusion and inclusive growth. This study departs from previous studies and adds to the literature by decomposing financial inclusion into access and usage component for the analysis. Further, consistent with the conceptualization of inclusive growth as having both benefit and participation components, this study breaks down inclusive growth into these components for detailed analysis.

2.2.4.2 Financial Literacy and Inclusive Growth

One of the critical elements needed to end extreme poverty especially in developing countries is knowledge particularly financial knowledge and its application. Klapper, Lusardi, and Panos (2013) demonstrate that financial literacy is directly associated with actively partaking in financial markets and inversely linked to using credits from informal sources. Further, consumers with higher financial knowledge are noted to manage income shock better and have greater availability of unspent income and greater spending ability. This suggests that financial literacy enables consumers to handle external shocks and reduce their borrowings from informal sources with its relatively high cost that tend to impoverish the borrowers. Robson (2012) asserts that financial literacy empowers the vulnerable to effectively manoeuvre the intricate financial environment. Therefore, financial literacy can enable risk mitigation that come with choosing among financial alternatives especially in venture creation.

Research work on financial literacy have concentrated on areas such as definitional issues (Remund, 2010); levels of financial literacy among a group (Ansong & Gyensare, 2012; Chen & Volpe; 1998; Lusardi, Mitchell, & Curto, 2010). Other research investigates the impact of financial literacy on financial behaviour (Cole, Sampson, & Zia, 2011; Guiso & Jappelli, 2008; Lusardi & Mitchell, 2007; van Rooji, Lusardi, & Alessie, 2011); while others concentrate on the measurement of financial literacy (Van Rooji et al. 2007; Perry & Morris, 2005). These studies measure financial literacy by assessing the extent of financial knowledge among some groups.

Not much research has investigated how financial literacy can influence growth or development. Among the few studies on this subject is the work of (Hogarth, 2006). Hogarth examines financial education in the US as it relates to civic and economic expansion using data from a community

development credit union. The study finds that financial education programmes make a difference in communities though those differences are not robustly documented.

Batsaikhan & Demertzis (2018) argue that equipping people with financial knowledge and tools enable them to better steer the increasing complex financial environment is a pre-condition to attaining inclusive growth in the European Union. It is argued that for the poor and disadvantaged, improved financial literacy offers increased opportunities to both share in the gains of growth and participation in the growth process. Research on the relationship between financial literacy and inclusive growth in the literature have predominantly been on developed countries. The contention is that financial literacy is more relevant in developed countries because it becomes more essential with sophisticated development.

However, considering the role of financial literacy in an economy, developing countries with a lot of low income individuals, less educated people and marginalized groups (women and young ones), financial literacy is equally relevant in developing economies. Batsaikhan and Demertzis (2018) explore the link between financial literacy and inclusive growth within the European Union (EU) and find among other things that financial literacy is inversely correlated with the three key components of inclusive growth in the EU, being poverty, social exclusion and mobility, and inequality. Therefore, financial literacy enables people in the EU to contribute to growth and benefit from it.

Dinesha (2017) studies the connection between financial literacy and inclusive growth in India and reveals that, having financial knowledge enhances one's access to funds as it generates incentives and atmospheres that not only encourage appropriate financial conducts but also enable people to

embark on economic ventures that take them out of poverty. These two studies are nonetheless descriptive in nature. Further, Kurihara (2013) evaluates the link between financial skill and economic growth in fifty-six (56) countries across Asia, North America & Europe for 2009 - 2011 and finds that financial skill confers economic growth. However, financial competences do not lead to a decline in inequality. The study does not control for other variables that affect growth. Also, Engström and McKelvie (2017) study financial literacy, role models and micro-enterprise performance in the informal economy among seven hundred and thirty-nine (739) micro-enterprises in Ecuador using OLS and find that financial literacy is an essential enabler of financial performance but does not lead to growth. Their study also reveals that use of role models forecasts return on investments. Nonetheless, the research focused only on the informal economy.

Studies on the nexus between financial literacy and inclusive growth in Africa is very dearth. Oseifuah (2010) investigates how financial literacy stimulates youth entrepreneurship in South Africa in the Vhembe District and finds that financial literacy greatly enhances entrepreneurship abilities and performance. A study in Kenya also reveals that financial literacy is connected to economic and social development and it plays a key role in fighting poverty. Also, it reveals that high financial literacy levels tend to show high growth rates with minimal poverty levels and narrower inequality (Nairobi BM, 2017). This finding suggests that financial illiteracy is a setback for poverty alleviation efforts and growth. This presents a gap that this thesis seeks to fill.

2.2.2 Financial Literacy and Financial Inclusion

The literature indicates that earlier empirical research concerning financial literacy have largely focused on three areas (Almeberg & Widmark, 2011). The first area centers on studies that

examine the extent of financial literacy at country levels. These include the works of Lusardi and Mitchell (2014); Agnew, Bateman, Eckert, Iskhakov, Louviere, and Thorp, (2014); Beckman (2013); Bucher-Koenen and Lusardi, (2011); Klapper and Panos, (2011); Sekita, (2011); and Alessie, van Rooij, and Lusardi (2011). These studies find that there is low level of financial literacy in countries that even have strong financial environments such as United States, Australia, Romania, Germany, Japan, Netherlands and Russia.

The second area of studies investigates the effects of financial literacy on financial decisions with respect to saving, investment, credit management, asset management, planning for pensions and stock market involvement (Dvorak & Hanley, 2010; Bernheim & Garrett, 2003; Behrman, Mitchell, Soo, & Bravo, 2012; van Rooij, Lusardi, & Alessie, 2011; Jappelli & Padula, 2013; Lusardi & Mitchell, 2007a, 2007b, 2008; Clark, Lusardi, & Mitchell, 2014). Van Rooij, Lusardi & Alessie, 2012; van Rooij et al., 2011; Bönnte & Filipiak, 2012; Hsiao, Chen, & Liao, 2016; and Shen, Lin, Tang, & Hsia, 2016) indicate a direct relationship between financial literacy and financial decisions.

The third strand of literature evaluates the nexus between financial education and financial literacy (Bay, Catasu, & Johed, 2014; World Bank, 2009; Fox, Bartholomae, & Lee, 2005; Willis, 2009; Lyons, Cheng, & Scherpf, 2006; Oehler & Werner, 2008). The outcomes of these studies confirm that financial education positively influences financial literacy. Thus, as financial education increases financial acumen in making choices improves. From the literature so far, studies that link financial literacy to financial inclusion in Africa is virtually non-existent. The PISA/OECD (2012) asserts that financial literacy has become very relevant for all the economic units because it enables

consumers to take prudent financial decisions and increase their demand for innovative superior products. This demand for higher quality financial services has the tendency to stimulate the development of new products to meet the need of sophisticated consumers and this will improve financial inclusion.

Research on financial inclusion has focused on measuring financial inclusion (Demirguc-Kunt & Klapper, 2013; Gupte, Venkataramani, & Gupta, 2012; Sarma, 2012; Chakravarty & Pal, 2010). Other areas of focus of the financial inclusion research are channels (Donovan, 2012; Rooyen, Stewart, & Wet, 2012; Fuller, 1998); and factors that affect financial inclusion (Clamara, Pena, & Tuesta, 2014; Gardeva & Rhyne, 2011; Diniz, Birochi, & Pozzebon, 2012).

Studies that assess the connection between financial inclusion and financial literacy are scarce. UNDP (2012) asserts that a study that links financial literacy to financial inclusion is very relevant because the extent of being financially literate most likely influences access, usage, and the quality of financial services that clients demand, though this paper is a theoretical one. Grohmann, Klühs, and Menkhoff (2018) analyze the effects of financial literacy on financial inclusion in different countries and discover that financial literacy is strongly linked to higher financial inclusion.

The study of Klapper, Lusardi, and Panos (2013) examine the significance of financial literacy on behaviour using panel data from Russia and discover that financial literacy contributes to one's participation in the financial markets but inversely linked to accessing credits from informal places. A related study by Fernandes, Lynch, and Netemeyer (2014) on the relationship between financial literacy and financial behaviour report that strategies to improve financial literacy explain only 0.1% change in financial behaviour with fragile impacts on low income samples. It further

finds that financial education decays with time even with large interventions. This finding suggests just in time financial literacy should be tied to specific behaviour.

Similarly, Miller, Reichelstein, Salas, and Bia (2014) find that financial literacy programmes that focus on a particular behaviour result in making better financial choices. Sangeetha, Mathew, and Francline (2017) examine the contribution of financial literacy in achieving financial inclusion in India and conclude that financial literacy contributes to financial inclusion though, the exact role was not pointed out. A study by Gupta and Singh (2013) argue that though financial literacy levels are high in some states in India, there is low level of usage of financial services in those states. This gives indication that knowing about financial services or being financially literate does not necessarily mean this knowledge will translate to usage.

Some researchers have also examined the relationship between financial literacy and financial inclusion in countries in Africa. For instance, a study by Tustin (2010) in South Africa reveals that financial knowledge enhances individual financial decision making behaviour. Warchira and Mkihiu (2012) examine how financial literacy affects access to finance based on the 2009 National Financial Access (NFA) survey in Kenya and find that financial literacy impacts financial access positively, though not statistically significant. Further, Robert, Natamba, Zulaika, Akankunda, and Esther (2013); and Hielties and Patova (2013) use survey data from clients and employees of MFIs in eastern Uganda and conclude that there is no evidence that financial literacy impacts financial inclusion. Sangeetha, Mathew and Francline (2017) also examine the contribution of financial literacy in achieving financial inclusion in India and conclude that financial literacy plays a role in promoting financial inclusion.

With this conflicting evidence about the relationship between financial literacy and financial inclusion, Bongomin, Ntayi, Munene and Akol (2016) examine whether financial literacy passes through a channel to affect financial inclusion. To this end, they examine the intervening role of social capital in financial literacy and financial inclusion in rural Uganda using cross sectional data. They find that social capital is an important conduit to channel financial literacy to achieve financial inclusion. In addition, they also find that financial literacy does not impact financial inclusion directly but rather through social capital. A related study by Bongomin, Ntayi, Munene and Akol (2018) shows that networks greatly moderates the relationship between financial literacy and financial inclusion.

This study seeks to add to the debate on the link between financial literacy and financial inclusion by exploring the role of financial institutions as a channel for promoting financial literacy to achieve financial inclusion. It also explores this relationship in Africa which is broader in scope compared to individual countries in earlier studies. This study unravels how the relationship between financial literacy and financial inclusion is achieved. Financial institutions as a channel adds to the channels of social capital and networking identified by Bongomin et al. (2016) in the literature.

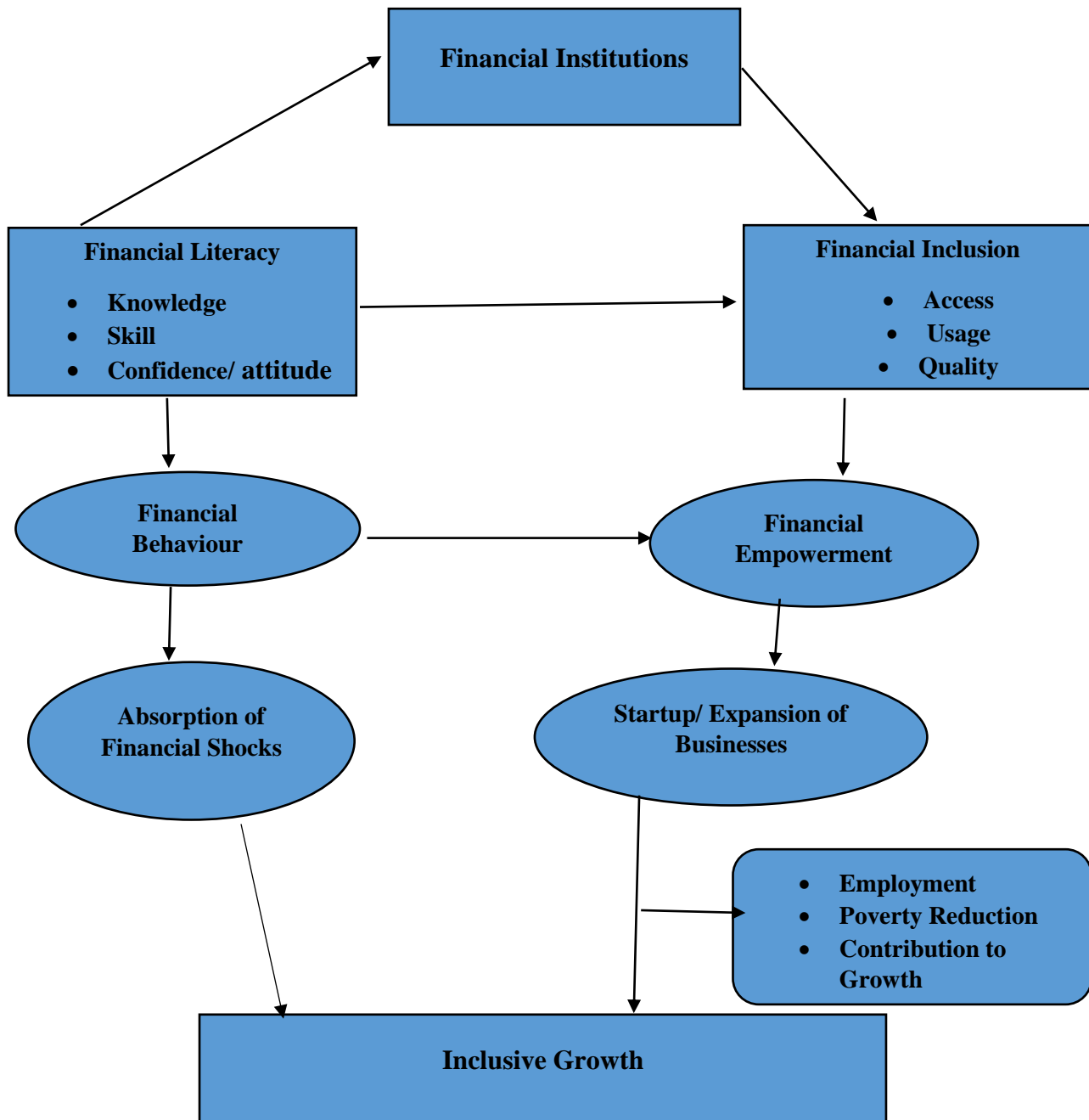
To conclude, this literature review has highlighted the theoretical foundations for the study. It focuses on the relevance of the concepts, measurements and the relationships between the concepts. It also considers theories that can be used to study financial literacy and financial inclusion. The literature review reveals that there are no specific theories in finance on financial literacy though some theories in psychology can be applied to examine financial literacy studies.

This presents a theoretical gap in the literature. In addition, it reviews literature on empirical studies on the interrelationship between inclusive growth, financial literacy, financial inclusion and financial institutions. Finally, the linkages among financial inclusion, financial literacy and inclusive growth are presented in a conceptual framework to form the basis for the study.

2.3 Conceptual Framework

In order to establish the linkages among financial inclusion, financial literacy and inclusive growth, the researcher develops a conceptual framework depicted in Figure 5 for the study.

Figure 5: Conceptual Framework: Financial inclusion, Financial Literacy and Inclusive Growth

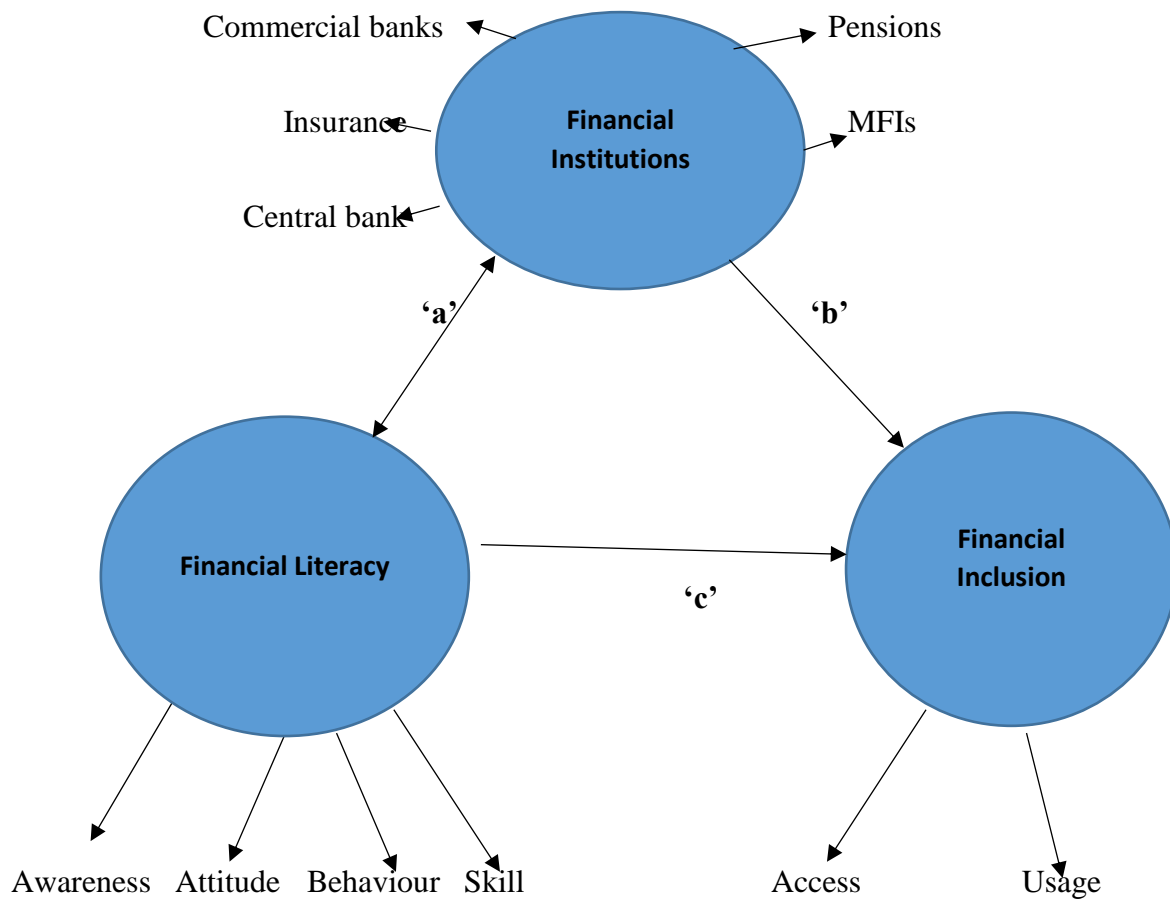


(Author, 2018)

The framework in Figure 5 illustrates how financial literacy can influence financial inclusion either directly or through financial institutions (acting as a mediator) to achieve inclusive growth. The

argument is that financially literate people are likely to show improved financial behaviour and decision-making. This enables them to absorb financial losses better and contribute to growth to make it inclusive. The framework also shows how financial inclusion can lead to financial empowerment that enables the formation of startups or the expansion of businesses. This has the potential to foster employment generation, poverty reduction, contribution to growth and hence, make growth inclusive. The detailed framework on how financial institutions can be a channel for transmitting financial literacy to achieve financial inclusion is presented in Figure 6.

Figure 6: Framework Showing Relationship between Financial Literacy, Financial Institutions and Financial Inclusion.



(Author, 2018)

The framework in figure 6 shows how financial institutions (mediator) can act as a channel or medium through which financial literacy (independent variable) can be promoted to achieve financial inclusion (dependent variable). The pathways ‘a’ and ‘b’ show the indirect effect of financial institutions on the link between financial literacy and financial inclusion. Pathway ‘a’ shows the effects of financial literacy on financial institutions; pathway ‘b’ shows the influence of financial institutions on financial inclusion; while pathway ‘c’ shows the direct effect of financial

literacy on financial inclusion. However, there is the possibility that financial institutions may also influence financial literacy along the “a” path. The emphasis of this framework is on the indirect path through which financial institutions channel financial literacy to achieve financial inclusion. Financial institutions can stimulate financial literacy as they interact with actual and potential customers and also develop products that meet the needs of clients.

2.4 Stylized Facts on Financial Inclusion, Growth and Poverty in Africa

2.4.1 Financial Inclusion

Report from Demirgüç-Kunt, Klapper, Singer, and Van Oudheusden (2015) shows that the number of banked people has improved tremendously since 2011. However, Africa and Asia are still the home to most of the world’s unbanked. Chithra and Selvam (2013) assert that the state of financial inclusion is generally assessed by the citizen’s ability to access financial products from mainstream institutions. It must be emphasized that access to financial services alone may not be inclusive enough but there should also be usage of the financial services which must meet the needs of the citizenry.

Demirguc and Klapper (2012) analyze financial inclusion focusing on individual and enterprise users of financial products in Africa using the Global Findex and Enterprise Survey data respectively. They found wide differences in account ownership which ranges from 7% in Central Africa to 42% in Southern Africa. These accounts are used for deposits/saving, withdrawals and remittances. The saving behavior of adults who owned formal accounts as a percentage of the population is about 12% and about 26% saves using other methods. This falls below that of the world population where about 25% saves with financial institutions with 10% using other means

to save. In terms of credits, borrowing from formal and informal institutions is relatively high in Africa with about 44% of adults having accessed credit during the past 12 months compared to 34% globally. The purpose of the borrowings is mainly for emergency/health, school fees and social events (funerals and weddings). User of insurance services is very low in Africa. About just 3% of adults' report that they have contributed towards insurance in health.

Evidence also shows that firms in Africa lack access to bank credit irrespective of their sizes and especially SMEs face more acute financial constraints due to credible collateral. In addition, the stock markets in Africa relative to other developing economies are not well capitalized. World Bank Enterprise Surveys reveal that though the proportion of businesses that have bank account in Africa is comparable to other developing countries, firms in Africa Sub-Sahara like other developing countries have limited access to global financial markets. It also demonstrates that about only 22% of firms have a line of credit with a financial institution. This makes most SMEs finance their investments through internally generated funds. On the whole, the percentage of bank funding in Africa is 8% relative to 11% in other developing countries. Also, equity funding is smaller than 2% compared to approximately 8% in other developing nations. The data also suggests that firms in Africa with comparable opportunities for growth as businesses in other developing countries depend on internally generated funds instead of securing finance from financial institutions due to high cost implications and other constraints.

Dirmuguc and Klapper (2012) conclude that in spite of the recent increase in growth of the financial environment in Africa, many economic units still do not get access to finance. Africa falls behind other developing countries when it comes to accessing and using financial products

by both individuals and firms. Financial inclusion across the world is shown in Table 2. The table depicts that in most cases Africa lags behind other developing regions like Asia by examining the financial inclusion variables.

Table 2: Financial Inclusion around the World relative to Africa

FINANCIAL INCLUSION INDICATORS	East Asia & Pacific	Europe & Central Asia	LA & Caribbean	Middle East	South Asia	SS Africa	World
Account	68.96	51.43	51.40	14.23	46.40	34.21	61.51
Account at a financial institution	68.76	51.38	51.14	13.97	45.49	28.90	57.36
Borrowed any money in the past year	41.21	39.50	32.74	45.73	46.66	54.49	54.05
Borrowed for education or school fees	7.08	6.17	8.29	8.22	8.87	12.34	42.64
Borrowed from a financial institution	10.98	12.44	11.31	5.62	6.39	6.29	7.67
Borrowed from a private informal lender	2.50	2.10	4.67	7.87	10.94	4.70	10.69
Borrowed from family or friends	28.27	23.58	13.49	30.74	31.39	41.92	4.55
Borrowed to start, operate, or expand business	8.32	2.81	6.14	4.22	8.57	12.81	26.18

Credit card	12.53	18.46	21.62	2.07	3.29	2.68	7.11
Credit card used in the past year	10.80	14.86	18.04	1.46	2.63	1.85	15.12
Debit card	42.95	36.86	40.41	8.53	18.02	17.87	40.10
Debit card used in the past year	14.79	22.93	27.66	3.30	8.51	8.65	23.22
Mobile account	0.40	0.26	1.72	0.68	2.65	11.51	2.02
Saved any money in the past year	70.96	38.50	40.58	30.45	36.25	59.56	56.45
Saved at a financial institution	36.49	8.37	13.46	3.99	12.67	15.90	27.38
Used a mobile phone to pay utility bills	1.14	0.76	0.78	0.08	0.24	2.45	2.03
Used an account at a financial institution to pay utility bills	11.79	12.54	6.28	0.24	2.73	2.75	16.73
Used an account to receive government transfers	8.14	7.25	9.02	0.86	3.06	3.77	8.17
Used an account to receive wages	15.06	22.51	17.96	3.28	3.51	7.32	17.67
Used the Internet to pay bills or buy things	15.61	11.92	6.93	2.15	1.19	2.44	16.62

Data: Global Findex (Global Financial Inclusion Database), 2014

2.4.2 Economic Growth Trends

During the past twenty years Africa has witnessed sustained increasing GDP growth at a mean rate of 5% per year. Though GDP is increasing, Africa trails behind other regions of the world. Per capita GDP growth is still smaller compared to other developing regions like Asia. The growth in

Africa is also from a low base predominantly from the export of commodities. IMF and World Bank forecast that Africa will remain one of the profligate growth regions worldwide even as it faces dwindling commodity prices. World Bank (2015) report shows that though growth rate fell to 3.7% from 4.6% in 2014, this is likely to pick up gradually in 2016 and 2017.

The extent to which this growth has translated to poverty reduction is however unclear (World Bank, 2015). Data shows that the share of the poor that depend on less than \$1.90 a day in Africa has declined from 56% in 1990 to 43% in 2012 which is still quite high. Ironically, though Africa is among one of the world's most growing regions, the level of poverty is high and as of 2016, the ten poorest countries in the world were all in Africa (www.mapsofworld.com). This suggests that despite growth in GDP, reduction in poverty has been slower in Africa compared to other parts of the world. Table 3 shows the trends of per capita GDP growth across the regions since the 1980's. From the table the per capita GDP of Sub-Saharan Africa lags behind most of the regions over the period.

Table 3: Trends in per Capita GDP Growth

REGION/YEAR	1981	1984	1987	1990	1993	1996	1999	2002	2005	2008	2010	2011	2012	2013
East Asia & Pacific	3.0	4.2	3.8	4.0	2.4	3.6	2.0	2.9	4.2	2.9	6.6	3.9	4.1	3.9
Europe & Central Asia	-0.2	2.1	2.4	1.8	-1.2	1.6	2.8	1.5	2.4	0.6	2.2	1.8	-0.1	0.0
Latin America & Caribbean	-1.9	1.8	1.4	-1.3	2.1	1.7	-1.5	-1.0	3.1	2.7	4.5	3.2	1.7	1.6
Middle East & North Africa	-1.2	-3.5	-2.3	7.6	0.8	3.1	0.9	0.5	3.5	2.8	2.9	1.6	1.2	0.7
South Asia	3.9	1.8	1.8	3.1	2.2	4.7	5.8	1.9	7.0	2.3	7.5	4.8	4.2	4.8
Sub-Saharan Africa	-2.9	-0.7	-2.7	-0.4	-2.8	2.5	-0.5	0.3	2.8	2.6	2.5	1.5	0.9	1.9
World	0.2	2.8	1.8	1.2	0.1	1.9	1.9	0.9	2.5	0.6	3.1	1.9	1.3	1.2

Data source: World Development Indicators, (World Bank, 2015)

2.4.3 Trends in Poverty around Africa relative to the World

Generally, poverty around the world has been reducing over the years with Europe and Central Asia; and Middle East and North Africa showing lower rates of poverty as estimated by the poverty gap in comparison to the other regions. Though poverty levels in Sub-Saharan Africa has been reducing since 1996, relative to the other regions poverty levels in Sub-Saharan Africa is relatively very high. This trend is depicted in Table 4. This raises a concern and the need for a concerted effort to address the challenge hence, the analysis of financial inclusion and inclusive growth to examine how these can help address the challenge.

Table 4: Global Trends in Poverty – Living on less than \$1.90 a day (2011 PPP) (%)

REGION/YEAR	1981	1984	1987	1990	1993	1996	1999	2002	2005	2008	2010	2011	2012	2013
East Asia & Pacific	38.2	27.0	20.7	21.4	18.2	11.9	11.5	8.7	4.7	3.7	2.5	1.8	1.5	0.7
Europe & Central Asia	..	..	1.5	1.5	2.5	2.7	2.6	1.9	1.6	1.0	0.9	0.8	0.7	0.6
Latin America & Caribbean	6.6	7.7	6.0	6.5	6.0	6.1	6.0	5.3	4.3	3.1	2.9	2.8	2.6	2.6
Middle East & North Africa	..	1.6	1.7	1.1	1.0	0.9	0.7	..	0.6	0.4	..	..	..	..
South Asia	17.4	16.0	13.7	12.1	11.9	10.2	..	9.4	7.9	6.5	5.3	4.0	3.4	2.8
Sub-Saharan Africa	..	..	..	24.3	27.1	26.7	26.0	25.0	21.2	19.1	18.3	17.4	16.7	16.0
World	18.0	14.5	12.2	12.2	11.6	9.4	9.2	8.1	6.2	5.3	4.6	4.0	3.7	3.2

Data Source: PovcalNet, World Bank, 2016)

2.8.4 Landscape of the Financial System in Africa

Financial inclusion is low in Africa (World Bank, 2016) and Beck and Cull (2015) perceive that this is due to the banking system in Africa being less inclusive compared to other regions. They observe that when middle income countries in Africa (Angola, Algeria, Botswana, South Africa and Tunisia) are omitted from the sample, 16.5% of households confirm that they have an account with a formal financial institution and 21% of firms confirm they have a line of credit where as in other regions, the figures are 21% and 43% respectively. Mlachila, Dykes, Zajc, Aithnard, Beck,

Ncube and Nelvin (2013) point out that financial services are usually crowded around urban areas though the use of mobile phone banking/account is on the ascendancy in Africa compared to other regions in the world.

Microfinance institutions (MFIs) have been increasing at a mean rate of 20% per annum in the number of people who borrow and deposit money since 2005. MFIs have served about 45 million clients in 2014 in Africa (Mlachila, Jidoud, Newiak, Radzewicz-Bak, & Takebe, 2016). Though the transactions of MFIs are small compared to banks, they serve the poor with little or no collateral. It is envisaged that when financial literacy is integrated in the activities of MFIs, they can increase their contribution to financial inclusion.

Though pensions are growing in Africa and the estimated growth rate is about 7.5%, its coverage is low compared to international standards (Yermo, 2009). Dovi (2008) notes that African countries do not have strong pension funds to drive savings. Mostly, contributions to pensions are denominated by mandatory contributions by those in the formal sector with very little contributions from those who work in the informal sector. One reason for fewer use of pensions in Africa is low level of financial literacy. World Bank (2015) observes that it is important to increase attention of the labour force to participate in retirement and social security programmes, and to expand the share of the deprived who are elderly to be covered by social benefits. This calls for improved education for people to appreciate the need for pensions. This is likely to make those in the formal sector embark or increase their voluntary contributions and those in the informal sector sign up for pension contributions.

Generally, insurance penetration rate which is usually computed as total written insurance as a percentage (%) of a country's GDP is low in Africa because it is one of the most underinsured regions worldwide (Holzmann, Hinz, & Dorfman, 2012). Although insurance is important for economic expansion, most people in Africa do not have access to insurance services. Hence, insurance diffusion is low in most African countries because the citizenry is not aware of the relevance of signing up for insurance in addition to struggling to acquire their fundamental needs like food coupled with low income.

Other factors of low insurance in Africa include low awareness and understanding of insurance across population segments, lack of trust of financial services providers, lack of reliable information making it very difficult to assess people's risk. In addition, shallow financial markets make it difficult to raise enough money to capitalize insurance companies. There are wide disparities in the insurance penetration rate in Africa. For instance, while the penetration rate in Nigeria is 0.3%, that of South Africa is 16.99% which is the highest in the world and accounts for about three quarters of insurance uptake in the region (Axco World, 2017). There is therefore the need and opportunity to grow this industry. One way to promote this growth is through intensified education which inculcates financial literacy into the provision of insurance services and beyond can help resolve the challenge. When people clearly understand the role of insurance in their lives, they are more likely to sign up for it and this would increase the penetration rate, hence the relevance of financial literacy.

2.5 Chapter Summary

This chapter reviews the theoretical and empirical literature that provide the basis for the study. The theoretical review focused on definitional and importance of financial inclusion, financial literacy and inclusive growth. This is necessary to throw light on how to decompose financial inclusion and inclusive growth for appropriate measurements and analysis. In addition, measurement of the concepts in the existing literature is reviewed to show how this study departs from earlier measures. The review also highlights some of the theories that show the relationship between the concepts. The endogenous growth, empowerment and Schumpeter's theories establish the link between financial inclusion and inclusive growth. The self-efficiency theory and the goal setting theory of motivation originally used in psychology studies are applied to investigate the nexus between financial literacy and inclusive growth and also between financial literacy and financial inclusion.

Review of empirical studies that connect financial inclusion to inclusive growth reveal that there is dearth research in this area in Africa. That of the nexus between financial literacy and inclusive growth shows that empirical analysis of this relationship relative to Africa is very scarce in the literature. The review of the link between financial literacy and financial inclusion shows that the findings are inconclusive. This provides a gap to examine the channels through which financial literacy can influence financial inclusion. The review also reveals the gaps relating to the studies that examine the extent of financial inclusion and inclusive growth; the association between financial inclusion and inclusive growth; link between financial literacy and inclusive growth; and the mediating role of financial institutions to promote financial literacy to achieve financial inclusion, which this thesis addresses. Further, it shows the conceptual framework that depicts the

relationship between the concepts. Finally, some stylized facts on financial inclusion, poverty and growth trends are presented.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter discusses the methodology this thesis employs to achieve the objectives of the study. This chapter seeks to outline the methodology that the study uses to examine the relationship between financial inclusion, financial literacy and inclusive growth. The chapter is structured into five main sections. Section 3.2 presents the method of determining the extent of financial inclusion and inclusive growth; and the method of analysis for the nexus between financial inclusion and inclusive growth. Section 3.3 presents the method of analysis for the nexus between financial literacy and inclusive growth. The methodology for analyzing financial literacy and financial inclusion: The mediating role of financial institutions is presented in section 3.4. Section 3.5 shows the sources of data for the analysis. Finally, the sample for the study is presented in section 3.6.

3.2 Method of Analysis – Financial Inclusion and Inclusive Growth

The first objective of the thesis is to determine the extent of financial inclusion and inclusive growth in Africa; and to examine the nexus between financial inclusion and inclusive growth. The study computes two indices to determine the extent of financial inclusion and inclusive growth in Africa.

3.2.1: Steps for designing an Index

To construct each index, this study adopts the procedure for constructing composite indicators suggested by the OECD (2008). The steps include designing a theoretical framework, selecting appropriate variables/indicators and accounting for missing data. After these, one can use a multivariate analysis to select the most relevant indicators (where necessary) and normalize variables to remove the scale effect. The next steps are using appropriate weighting and aggregation method; and testing for robustness. Finally, the results of the index are presented.

Firstly, variables selected for the index are based on the theoretical foundation informed by the definition of financial inclusion which sees the concept from three main dimensions of access, usage and quality. This study focuses on the access and usage dimensions in the computation of the financial inclusion index. The quality dimension is omitted because quality is relatively not relevant in Africa now because the continent is still struggling with access to financial services. Secondly, there is no available data on the quality dimension.

The next step in the procedure of computing an index after the selection of appropriate variables is to account for missing data. The study samples countries that have data available. Some of the countries had few missing data points and these missing data are ignored in the study (Abayomi, Gelman, & Levy, 2008). The variables are then normalized to remove the scale effect using the model proposed by Sarma (2008).

Further, indicators and dimensions are weighted using the coefficient of variation approach originally used in portfolio analysis as suggested by Wang and Guan (2016). The aggregation method adopted is the weighted sum approach. Finally, to test for robustness, the weighting of

variables and dimensions are varied from computed weights to equal weighting and the index recomputed.

3.2.2 Designing the Index of Financial Inclusion

To determine the extent of financial inclusion, a financial inclusion index is computed using recent data from Global Findex (2014). The multi-dimensional nature of financial inclusion requires that it is measured using an index in order to capture its different dimensions. The study follows the procedure of computing financial Inclusion index proposed by Sarma (2008) but modified how the weights of the indicators are computed (Wang & Guan, 2016). The reason for modifying the method of weighting is to provide an objective view of the relative importance of each indicator and dimension to the index.

The study computes each normalized indicator of financial inclusion using the following formula:

$$X_{ij} = (A_{ij} - m_{ij}) / (M_{ij} - m_{ij}) \quad (3),$$

where X_{ij} is the transformed value of each indicator j in the dimension (Access, Usage)

A_{ij} is the actual value;

M_{ij} and m_{ij} are the maximum and minimum of each indicator respectively. The variables are transformed to normalize them to lie between 0 and 1. The purpose of the normalization is to remove the scale effect. The Index of Financial Inclusion in dimension i is computed as follows:

$$IFI_i = 1 - \sqrt{\frac{w_{i1}^2 * (1 - x_{i1})^2 + w_{i2}^2 * (1 - x_{i2})^2 + \dots + w_{in}^2 * (1 - x_{in})^2}{w_{i1}^2 + w_{i2}^2 + \dots + w_{in}^2}} \dots \dots \dots (4),$$

where X_{ij} is the transformed value ($0 \leq X_{ij} \leq 1$). w_{ij} denotes weight of indicator j in dimension i . The computed weight is relatively more objective compared to that of Sarma (2008). Sarma (2008) and Chakravarty and Pal (2013) somehow assigned weights to indicators in an index without providing a clear justification of the weighting method. This makes their method of weighting a relatively subjective one. Wang and Guan (2016) use the coefficient of variation (CV) defined as the proportion of standard deviation to the mean as the method of weighting in their study.

The coefficient of variation was originally applied in probability theory and statistics to measure the dispersion in a probability distribution. This is applied to study quality assurance by determining the variability of the population data of a frequency distribution; or by measuring the content or quality of the sample. CV is central in the arena of statistics to determine relative variability. The weight of the indicator is estimated as the ratio of its CV to the sum of all indicators CV and this helps to determine the contributions or the importance of the dimensions to the overall index. Empirically, the coefficient of variation will assign more weight to indicators and dimensions with more standard deviation. This implies that the more volatile a variable is, the more likely it will contribute to financial inclusion or inclusive growth.

This is given by:

$$w_{ij} = \frac{V_{ij}}{\sum_j V_{ij}} \quad (5),$$

where, w_{ij} represents the weight of indicator j in dimension i , and V_{ij} stands for the CV. Finally, IFI is determined using the following formula:

$$IFI = 1 - \sqrt{\frac{w_1^2 * (1 - IFI_1)^2 + w_2^2 * (1 - IFI_2)^2}{w_1^2 + w_2^2}} \quad (6),$$

where, w_1 and w_2 are the weights of the access and usage dimensions. Indicators that constitute access are account, credit and debit cards; while the indicators of usage are borrowings, savings, payments, remittances and withdrawals. The weights of these are computed following the CV approach.

Table 5: Indicators used to compute the Index of Financial Inclusion

Dimension	Sub-Dimension	Indicators	Data Source
ACCESS	Account	Account at a financial institution	GF (2014)
		Mobile account	GF (2014)
		Credit card	GF (2014)
		Debit card	GF (2014)
USAGE	Borrowings	Borrowed from a financial institution	GF (2014)
	Payments	Usage of internet to pay bills or buy things	GF (2014)
		Usage of an account for a transaction by mobile phone	GF (2014)
	Remittances	Sent remittances in the previous year	GF (2014)
		Received remittances in the past year	GF (2014)
	Saving	Saved at a financial institution	GF (2014)
	Withdrawal	Withdrawal in the past year (% with an account)	GF (2014)

Note: GF is Global Index

3.2.3 Computation of Inclusive Growth Index (IGI)

Inclusive growth is also a multi-faceted concept whose measurement require a number of indicators from different components. The Asian Development Bank (2014) recommends that attempts to attain inclusive growth should be made of a combination of mutually reinforcing

measures. These include promotion of efficient and economic growth; provision of an equal platform; and reinforcement of capacities; and provision of social protection. This suggests a multi-dimensional approach of measuring inclusive growth because single indicators may not fully capture the concept.

However, there is scanty literature on how to estimate inclusive growth except for an index constructed by McKinley (2010) using Asian Development Bank (ADB, 2014) indicators of inclusive growth for Asian countries. The major setback of McKinley's index is that no basis has been assigned for the weights applied to each component of inclusive growth. This makes the application of the weights somehow arbitrary. The indicators used by McKinley (2010) can be applied to the African context since both Asia and Africa are developing countries. This study departs from other research in the weighting method used. It computes the weights of the indicators and components using the principle of coefficient of variation in order to determine the relative contribution of indicators. The reason for using the CV approach is that it assigns more weights to indicators or components that contribute more to the index. Secondly, relying on this approach is more appropriate for Africa because the relative importance of the indicators of inclusive growth is different from other developing and developed countries.

The inclusive growth index is computed using the five broad components under four pillars of inclusive growth ADB (2014). The key indicators are: a. income and non-income poverty and inequality indicators (6); b. Efficient and sustained growth to generate work and opportunities – Economic growth and employment (3 indicators); key infrastructure endowments (4 indicators); c. Social inclusion to promote equivalent access to economic opportunity – getting inputs to education and health (4 indicators); Access to basic infrastructure, utilities and services (2

indicators); Gender parity and opportunity (4 indicators). The other dimensions are, d. Societal safety nets (2 indicators) and; e. Good governance and organizations (3 variables).

The procedure for normalizing each of the indicators under the five components of inclusive growth is comparable to the financial inclusion index by Sarma (2008). This is given by:

$$X_{ij} = (A_{ij} - m_{ij}) / (M_{ij} - m_{ij}) \quad (7),$$

where X_{ij} is the transformed value of each indicator j in the component (poverty & inequality; growth & expansion opportunity; societal safety nets; societal inclusion and good governance & organizations)

A_{ij} is the actual value;

M_{ij} and m_{ij} are the maximum and minimum of each indicator respectively. The variables are transformed to normalize them to lie in the range of 0 and 1.

The IGI in component i is determined as follows:

$$IGI_i = 1 - \sqrt{\frac{w_{i1}^2 * (1 - x_{i1})^2 + w_{i2}^2 * (1 - x_{i2})^2 + \dots + w_{in}^2 * (1 - x_{in})^2}{w_{i1}^2 + w_{i2}^2 + \dots + w_{in}^2}} \quad (8)$$

IGI is estimated using the following formula:

$$IGI = 1 - \sqrt{\frac{w_1^2 * (1 - IGI_1)^2 + w_2^2 * (1 - IGI_2)^2 + w_3^2 * (1 - IGI_3)^2 + w_4^2 * (1 - IGI_4)^2 + w_5^2 * (1 - IGI_5)^2}{w_1^2 + w_2^2 + w_3^2 + w_4^2 + w_5^2}} \quad (9)$$

3.2.4: Test of Robustness of an index

Researchers such as (Decancq & Lugo, 2013; Foster et al., 2012; Cherchye, Lovell, Moesen, & Puyenbroeck, 2007a; Cherchye, Moesen, Rogge, & Puyenbroeck, 2007b) have argued that sometimes the level of an index depends on the choice of weights, hence a change in weight may alter the judgment across a pair of alternatives. Decancq and Lugo (2013) discuss that though there are a number of ways of selecting initial weights, none may be precise as to exclude alternative weights. Given that an assigned weight may influence the level of an index, it is prudent to evaluate the level of robustness of an index. A number of studies have considered robustness of composite indices. Cherchye et al. (2007b) examine sources of uncertainty in the construction of a composite index. They argue that variation in the selection of weights, normalization, aggregation techniques and choice of indicators can lead to a distribution of values around the initial index value. McGillivray and Noorbakhsh (2007) assess the impact of changing weights by determining the correlations between the original Human Development Index country ranks and those arising from alternative weights and conclude that the results slightly differ for some countries.

Foster, McGillivray, and Seth (2013) offer an approach to appraising robustness with respect to weights that are based on dominance quasi-ordering approach which is similar to stochastic dominance and related techniques used in income distribution analysis. They indicate that the selection of robustness criterion depends on an appropriate set of weighting. However, the weight to use depends partly on the confidence in the initial weighting vector. To measure robustness, Foster et al. (2012) compare an index from a set of weighting and confirms that the rankings of the index is not reversed. They argue that when the comparison is fully robust over the set of weights then the difference between the initial and the current index should be less or equal to

zero. On the other hand, when the comparison is not completely robust the difference is greater than zero.

To check for robustness of the index, the weights for the components and indicators are altered to equal weighting and a new index computed to determine whether there will be significant differences (Foster, McGillivray, & Seth, 2013). The combined index is developed as a weighted mean score of 0 - 1, based on the performance of the five components. For each of the five components is the weighted mean of its sub-segments or variables in each sub-component. Each of the sub-components is scored from 0 – 1 and the resultant score has the weight that has been determined applied to it to get the overall composite index for that component. The weighted composite index for each of the components is summed up to get the final inclusive growth index. Generally, a score of 0 - 0.3 is considered unsatisfactory or low inclusive growth; 0.31- 0.5 is satisfactory or medium extent of inclusion and 0.51 - 1 as superior or high inclusion. The specific indicators for the computation of the index are indicated in Table 6.

Table 6: Indicators used to compute the Inclusive Growth Index

Component	Sub Component	Indicator	Data Source
Poverty and Inequality	Income Poverty and Inequality	Percentage of the populace that live below the national poverty line	WDI
		Percentage of the populace that live below \$2 a day at 2005 PPP\$	WDI
		Proportion of income or consumption share of the uppermost quintile to the lowermost quintile.	WDI

	Non-income Poverty and Inequality	Mean years of schooling (youths and adults)	UNDP
		Incidence of underweight children below five years of age	WDI
		Below-5 mortality rate per 1,000 live births	WDI
Growth and Expansion Opportunity	Economic Growth and Employment	Rate of growth average of GDP per capita at PPP (constant 2011 PPP\$)	WDI
		Rate of growth of average per capita income or consumption in 2005 PPP (bottom quintile, top quintile and total)	WDI
		Employment to population ratio (youth and adults)	WDI
		GDP per head engaged (constant 1990 PPP\$)	WDI
		Number of own-account and contributing family workers per 100 wage and salaried workers.	WDI
		Depositors with commercial banks per 1000 adults	WDI
Social inclusion to access equal economic opportunity	Access and inputs to education and health	School life expectancy	UIS
Social inclusion to access equal economic opportunity	Access and inputs to education and health	Pupil-teacher ratio (primary)	WDI
		Government spending on education as a share of total government spending	WDI
	Basic Infrastructure	Government spending on health as a share of total government spending.	WDI

	Utilities and Services	Percentage of populace that use improved drinking water	UNICEF
		Percentage of populace that use improved sanitation facility	WHO
	Gender Equality and Opportunity	Gender equality in primary, secondary and tertiary education.	UNESCO
Social Safety Nets	Gender Equality and Opportunity	Pregnancy care coverage (at least one visit)	WDI
		Gender equality in labour participation	ILO
		Share of seats held by women in national parliament.	WDI
		Social security and labour rating	WDI
Social Safety Nets Good governance and institutions		Social protection on health as a share of government expenditure on health	WHO
		Voice and accountability	WGI
Good governance and institutions		Government effectiveness	WGI
		Control of corruption	WGI

Note. WDI is World Development Indicators, UNDP is United Nations Development Plan, UIS is UNESCO Institute for Statistics, UNICEF is United Nations International Children’s Fund, WHO is World Health Organization, UNESCO is United Nations Educational, Scientific and Cultural Organization, ILO is International Labour Organization, WGI is Worldwide Governance Indicators.

3.2.4 Model Specification

The Model

The study adopts a dynamic panel GMM technique propounded by (Arellano & Bond, 1991; Arellano & Bover, 1995; Holtz-Eakin, Newey, & Rosen, 1988) and applied by (Beck et al., 2007; Rioja & Valev, 2004) and (Beck & Levine, 2004) from the growth literature to examine the link between financial inclusion and inclusive growth. This involves the use of a dynamic effect where a lag of the dependent variable is part of the independent variables. Generally, the model is given by:

$$Y_{it} = \alpha Y_{i,t-1} + \beta_1 X_{1it} + \beta_2 X_{2it} + \dots + \beta_n X_{nit} + \varepsilon_{it} \quad (10),$$

$$\varepsilon_{it} = \mu_t + \lambda_i + e_{it}$$

where Y_{it} is the dependent variable; $Y_{i,t-1}$ is the lag of the dependent variable Y ; β_i 's is the coefficients of the independent variables; X_{it} is a set of the independent variables; u_i is either fixed effects or a random effects term (panel specific term) in the sense that X_{it} is not required to be independent on μ_t and λ_i captures the (unobserved) individual and time specific effects; ε_{it} is the error term; $i = 1, 2, \dots, N$ are the countries of observation; $t = 1, 2, \dots, T$ is the time. Even with the assumption that ε is independent and identically distributed, the presence of both $Y_{i,t-1}$ and u_i in the model render both the fixed and random effects estimators to be unreliable because of the Nickell bias as $Y_{i,t-1}$ will be associated with the error term (Nickell, 1981). The theoretic purpose of the dynamic panel is that it models a partial adjustment, hence the coefficients on the lagged dependent variable measures the adjustments.

Also, the lagged dependent variable can remove the existence of autocorrelation. The model is usually estimated using the generalized method of moments (GMM) which operates in a comparable manner as the two-stage least squares and overcome the problem of endogeneity. The existence of the lagged dependent variable among the regressors is as a result of theory (Keele & Kelly, 2005). Some of the criticisms of dynamic panel data models are that dynamics are mostly complex compared to a single lagged dependent variable; models for modelling unobserved heterogeneity and ignoring the stationarity of variables. Panel data estimation helps improve some statistical challenges associated with strictly cross-country investigations. For example, panel evades biases related with cross- country regression. Panel incorporates the inconsistencies in the time-series dimension. Hence, one advantage of using panel is the capacity to exploit the time series and cross-sectional changes in the data.

To evaluate the relationship between financial inclusion and inclusive growth, financial inclusion is decomposed into access and the usage dimensions. Inclusive growth is also decomposed into participation dimension (proxied by employment to population ratio) and benefit dimension (proxied by poverty and inequality). The specific equations estimated are equations 11, 12 and 13:

$$ETPR_{i,t} = \alpha ETPR_{i,t-1} + \beta_1 ACDX_{i,t} + \beta_2 USDX_{i,t} + \gamma_1 TGDP_{i,t} + \gamma_2 INFL_{i,t} + \gamma_2 AYSC_{i,t} + \gamma_3 LEXP_{i,t} + \gamma_4 FDGD_{i,t} + \varepsilon_{it} \quad (11),$$

$$\text{and } \varepsilon_{it} = \vartheta_i + \eta_t + e_{it}$$

The composite error term, ε_{it} , is decomposed into three components, namely the country fixed effects (ϑ_i), time effect (η_t) and the stochastic error term (e_{it}) assumed to be independently and identically distributed.

where $i = 1, 2, \dots, N$ are countries of observation; $t = 1, 2, \dots, T$ is time

ϑ_i , and η_t are the (unobserved) cross sectional and time specific effects respectively.

The period for this analysis is 2004 to 2014.

ETPR is the dependent variable for participation dimension of inclusive growth measured by Employment to population ratio.

ACDX is Index of access dimension of financial inclusion (made up of ATMs, bank branches and Mobile accounts) - *ACDX*

USDX is index of usage dimension of financial inclusion (made up of bank accounts, borrowings and savings) - *USDX*

TGDP is Trade to GDP; *INFL* is Inflation rate; *AYSC* is Average years of schooling; *LEXP* is life expectancy; and *FDGD* is FDI to GDP. These are the control variables.

Equation 11 is the model for investigating the effect of financial inclusion on the participation dimension of inclusive growth.

To evaluate the nexus between financial inclusion and the benefit dimension of inclusive growth equations 12 and 13 are estimated.

$$POV_{i,t} = \gamma POV_{i,t-1} + \beta_1 ACDX_{i,t} + \beta_2 USDX_{i,t} + \beta_3 TGDP_{i,t} + \beta_4 INFL_{i,t} + \beta_5 AYSC_{i,t} + \beta_6 LEXP_{i,t} + \beta_7 FDGD_{i,t} + \vartheta_i + \eta_t + e_{it} \quad (12),$$

$$INEQ_{i,t} = \varphi INEQ_{i,t-1} + \beta_1 ACDX_{i,t} + \beta_2 USDX_{i,t} + \kappa_1 TGDP_{i,t} + \kappa_2 INFL_{i,t} + \kappa_3 AYSC_{i,t} + \kappa_4 LEXP_{i,t} + \kappa_5 FDGD_{i,t} + \vartheta_i + \eta_t + e_{it} \quad (13),$$

where, *POV* and *INEQ* are dependent variables for the benefit dimension of inclusive growth proxied by income poverty and income inequality respectively.

Table 7: Variables and Expected Relationship

Variable		Definition	Proxy Indicator	Source	Expected Sign
Dependent Variable					
Employment to population ratio	ETPR	Percentage of the labour force currently employed to the total working age populace of a country. Indicator of economic participation.	Employment to population ratio, 15+, Total (%) (Modeled ILO estimates)	WDI	
Poverty	POV	Poverty gap. Indicator of benefit dimension of inclusive growth.	Poverty gap at \$1.90 a day (2011 PPP)%	WDI	
Inequality	INEQ	Gini index. Indicator of benefit dimension of inclusive growth.	Gini index (World Bank estimate)	WDI	
Independent Variables					
Access Index	ACDX	A fused measure of access to formal financial services. One of the key dimensions of financial inclusion that relates to access or reach to formal financial products	Commercial Bank Branches (per 100,000 adults) ATMs per 100,000 adults Mobile account (% age 15+)	Index is computed by Author using data from WDI	Positive

Usage Index	USDX	A fused measure of use of financial products. One of the key dimensions of financial inclusion that shows actual use of financial services/products regularly & frequently.	Account at a financial institution (% age 15+) Borrowed from a financial institution (% age 15+) Saved money at a financial institution (% age 15 +)	Index is computed by Author using data from WDI	Positive
Control Variables					
Trade to GDP	TGDP	Captures the degree of trade openness of an economy.	Trade (% of GDP)	WDI	Positive
Inflation rate	INFL	One of the factors that influences poverty.	Inflation, Consumer prices (annual %)	WDI	Negative
Average years of schooling	AYSC	Captures human capital	Mean years of schooling of adults (aged 15+).	WDI/ Barro & Lee	Positive or Negative
Life Expectancy	LEXP	Represents the basic health conditions of the population.	Life expectancy at birth, total	WDI	Positive or Negative
FDI to GDP	FDGD	Captures the role of macro-economic conditions.	Overseas direct investment, net inflows (% of GDP)	WDI	Positive or negative

Note: The variables in Table 7 are used in equations (11), (12) and (13) to estimate the relationship between financial inclusion and inclusive growth.

3.2.5 Justification of Model

The study uses panel data for the analysis because panel data is superior to only time series and cross section data. Hsiao (1986) and Klevmarken (1989) assert that panel data controls for individual heterogeneity hence, results are not likely to be bias. It also provides more information on the data, better variability, low collinearity amid the variables and better efficiency. In addition, panel data better investigates the dynamics of alteration and has the ability to spot and determine effects that cannot be easily noticed in cross sectional and time series data. Finally, panel data tests

more complex models. Though the use of panel may distort the measurement errors and also lead to selectivity problems such as attrition and self-selectivity, the benefits of using a panel arguably far outweighs its limitations.

3.2.6 Estimation Technique

To investigate the nexus between financial inclusion and inclusive growth, the study uses the system generalized methods of moments (S-GMM) estimator proposed by Arellano and Bover (1995) and Blundell and Bond (1998) for the estimation. S-GMM overcomes a potential weakness in the Arellano and Bond (1991) estimator where lagged levels are shown to be weak instruments for first differenced variables, particularly when the variables are close to stochastic process. S-GMM estimator comprises the lagged levels and lagged differences. Soto (2009) shows that the system GMM estimator has less bias and greater efficiency compared to the differenced GMM (D-GMM) given that some persistency exists in the series. It has been argued that system GMM is more useful in generating efficient results when the panel units (countries) are large and the time periods (years) are relatively small. This estimation technique adds additional moment restrictions and allows lagged first differences to be employed as instruments in the level equations and this corrects for any bias that would emerge when the differenced GMM by Arellano and Bond (1991) is used. In addition, S-GMM is more efficient in the presence of weak instruments as it uses more conditions compared to D-GMM. The extra moment conditions restrict the way that heterogeneity is related to the covariates, thus alterations in the covariates are unrelated with the unit specific heterogeneity. S-GMM uses the D-GMM estimation approach but augments by introducing an extra assumption that creates an extra set of moment conditions.

Hence, S-GMM necessitates that lagged variations in the dependent variable are strong instruments at the level of the lagged dependent variable in the level equation. When the additional assumption of S-GMM holds, it attains a better efficiency. Also, because it applies level form of the dynamic panel model and the differenced form, the impact of the regressors that do not change with time can be determined unlike the D-GMM that differenced them out. Similar to the D-GMM, S-GMM further requires that the unobserved effects and error terms do not correlate over cross-section units. In effect, the S-GMM estimator combines both difference and level equations and instruments used for the difference equations are the lagged estimates of the variables in levels. Also, variables are instrumented for by their first differences in level equation.

The S-GMM has gained much attention in the growth literature (Aghion, Bacchetta, Ranciere, & Rogoff, 2009; Cohen & Soto, 2007; Dalgaard, Hansen, & Tarp, 2004). Levine, Loayza, and Beck (2000) examine the impact of financial expansion on growth using a linear dynamic panel model. They used the S-GMM model to capture the unobserved, country specific effects in the face of the lagged dependent variable.

Roodman (2006) notes that the D-GMM and S-GMM models are intended for panel analysis. The main assumptions about the data generating process of these estimators are: some regressors may be endogenous; the process is usually dynamic with current dependent variable being influenced by the previous ones. In addition, the idiosyncratic disturbance can have individual –specific forms of heteroscedasticity and serial correlation (apart from those the fixed effects) and there can be arbitrary dispersed fixed individual effects. Further, the idiosyncratic disturbances are uncorrelated across individuals; the length of time of the data, T , which can be small with great N and finally,

the good instruments are within the data (internal) and are based on the lags of the instrumental variables though external instruments may be included.

3.3 Method of Analysis – Financial Literacy and Inclusive Growth

To investigate the link between financial literacy and inclusive growth the study applies the supply-leading and demand-following hypothesis which have been employed to explore the link between finance and growth. The supply-leading proposition argues that financial structure results in growth while the demand-following hypothesis suggests that growth propels financial infrastructure. Applying this to financial literacy and inclusive growth, the supply-leading hypothesis submits that financially literate consumers are prone to make prudent financial choices that reduce debt burdens, improve their well-being and enable them to undertake more productive economic activities which contribute to the growth process and make it more inclusive. The demand-following proposition argues that when GDP growth is inclusive poverty levels would reduce, well-being enhanced and consumers are likely to improve consumers demand for financial services. Increase in demand for financial products stimulate financial literacy which would further increase their demand and promote the development of other sophisticated financial products and reinforce financial literacy. However, the possibility of a bi-causal link between financial literacy and inclusive growth cannot be ruled out.

3.3.1 Model Specification

The literature is silent on a commonly agreed upon theoretical structure that underpin empirical work on growth. Levine and Renelt (1992) argue that the growth models that exist do not fully indicate which variables are to be held constant as an inference on the link between growth and

the variables of interest. For instance, Feder (1993) and Rati (1989) use improved neoclassical production function for their research. Barro (1990) and Romer (1989) use endogenous growth frameworks to study components of growth; while Grier and Tullock (1989) and Kormendi and Meguire (1985) use a multiplicity of models and variables in their exploratory empirical studies.

To evaluate the nexus between financial literacy and inclusive growth, this study adopts ordinary least square regression model that is employed in the study by Kormendi & Meguire (1985) where the independent variables enter the model separately and independently. The general model is given as:

$$Y_i = \beta_0 + \beta_1 M_i + \beta_2 Z_i + \mu_i \quad (14),$$

where, Y is the dependent variable – inclusive growth and the proxy variable is employment to population ratio (ETPR).

M is the main independent variable under consideration - financial literacy

Z is a set of control variables. These are share of government consumption to GDP, life expectancy and foreign direct investment.

μ_i is the error term

The specific models to be estimated are:

$$\ln ETPR_i = \beta_0 + \beta_1 \ln FINLITLEVEL_i + \beta_2 \ln RCGTGDP_i + \beta_3 \ln LE_i + \beta_4 FDI_i + \mu_i \dots (15),$$

$$\ln POVi = \beta_0 + \beta_1 FINLITLEVEL_i + \beta_2 \ln RCGTGDP_i + \beta_3 \ln LE_i + \beta_4 FDI_i + \mu_i \dots (16),$$

$$\ln FINLITLEVEL_i = \beta_0 + \beta_1 \ln ETPR_i + \beta_2 \ln RCGTGDP_i + \beta_3 \ln LE_i + \beta_4 FDI_i + \mu_i \dots (17),$$

$$\ln FINLITLEVEL_i = \beta_0 + \beta_1 \ln POVi + \beta_2 \ln RCGTGDP_i + \beta_3 \ln LE_i + \beta_4 FDI_i + \mu_i \dots (18),$$

where;

ETPR is employment to population ratio, a dependent variable and a proxy for the participatory dimension of inclusive growth when applying the demand following hypothesis but the main independent variable when using the supply leading hypothesis. POV is income poverty. In the demand following hypothesis model, POV is a dependent variable which is a proxy for the benefit dimension of inclusive. However, in the supply leading hypothesis, it is the main independent variable. FINLITLEVEL is financial literacy level, the main independent variable when applying the demand following hypothesis. However, when applying the supply leading hypothesis, financial literacy becomes the dependent variable. RCGTGDP is the percentage of government consumption spending to GDP. LE is life expectancy. FDI is foreign direct investment. RCGTGDP, LE and FDI are control variables.

Table 8: Variable Description, Measurement and Expected sign

Variable Name	Description	Measurement	Expected sign
ETPR (Inclusive Growth, Participation Dimension)	Employment to population ratio	Percentage of population	Dependent Variable
POV (Inclusive Growth, Benefit Dimension)	Income poverty	Ratio of populace living below US\$1.25 per day at (2005 PPP)	Dependent Variable
FINLITLEVEL	Financial literacy level	Percentage of population	+
RCGTGDP	Government Size	Share of GDP	+
LE	Life Expectancy	Years	+
FDI	Overseas Direct Investment (Net Inflow)	Share of GDP	+

Note: The variables in Table 8 are used in equations (15), (16), (17) and (18) to estimate the relationship between financial literacy and inclusive growth.

3.3.2 Justification of Variables

ETPR is the measure for inclusive growth (participation dimension) is employment to population ratio, which was the dependent variable. It is measured by the percentage of employment to population from ILOStat. A higher ratio is desirable. From the literature inclusive growth encapsulates both the contribution to growth as well as the benefit from growth. ETPR is a macroeconomic statistic that indicates the percentage of the working population that are currently engaged in work to the working-age (usually aged 15 and older) population of a country. The International Labour Organization's (ILO) data for determining this ratio includes almost all non-institutional populace of a nation, all forms of economic activity in all segments of the economy; as well as all groups of workers who are either in paid employment or self-employment (ILOStat). Hence, ETPR captures the population that participates in the growth process. However, one setback of this metric is that it is inadequate for assessing the extent of decent work (ILO, 2011). This data was sourced from ILOStat. The dependent variables are logged to show percent change in the variables.

POV is another proxy for inclusive growth. It is a dependent variable which captures the benefit dimension of inclusive growth. It is determined as the ratio of the populace that live below US\$ 1.9 a day at constant 2005 PPP. This is one of World Bank's measure of absolute poverty. The use of purchasing power parity dollars' controls for variations in price levels in different countries. A lower percentage is desirable. Poverty is included in the model because growth that is inclusive is expected to benefit the broad masses and reduce income poverty all things being equal. Economic growth does not essentially reduce poverty but it depends on how income is distributed among the population, hence inclusive growth becomes relevant. Though, Feng (2014) argues that

consumption is a more appropriate estimate of income poverty compared to income, there is data limitation does not permit the use of consumption measures to estimate poverty for this study. Poverty data is from World Development Indicators (WDI, 2014).

FINLITLEVEL is the next variable which is the level of financial literacy. The measure for this variable was percentage of adults of the population who are financially literate. The expected sign of the coefficient was positive because intuitively, enhanced financial awareness is related to a decline in poverty, thus inclusive growth. Kurihara (2013) argues that this intuition holds true because financial expansion reduces cost of accessing financial products and this helps households to undertake ventures that reduces inequality in opportunities. He employed a measure of financial skill to investigate the link between financial skill and growth in Japan. He found that financial skill promotes growth relative to other skills like information technology. The source of this data is S and P Global Financial Literacy Survey (2014).

RCGTGDP is percentage of government spending to GDP gives an indication of the size of government across countries. Theory have not provided robust deduction on the effect of government spending on growth. For instance, though Mitchell (2005) argues that most government spending impacts negatively on economic growth. Asghar (2012) confirms that government spending on education and law is an essential tool to reduce inequality and poverty especially in Pakistan and this promotes growth. This variable is logged to control for the size of government.

LE is life expectancy, indicative of the quality of life of a population. This variable is estimated as number of years and a higher value suggests a country has a good healthcare system which

promotes a healthy lifestyle. Life expectancy is denoted in the model by LE. It is included in the model because the quality of life influences the contribution to growth so the effect of this variable on growth was controlled for. The predicted sign of the coefficient is mostly expected to be positive because better health and longer life may increase productivity and growth as human capital improves (Acemoglu, Johnson & Robinson, 2005). The log of life expectancy was used for convenience in interpretation in percentage. Data source is WDI (2014).

FDI is foreign direct investment (net) and the unit of measurement is percentage of GDP. The net of this variable was used because it measures the net inflows of investment to obtain management interest for an extended period (at least 10% of voting right) in an organization that operates in an economy. It is usually made up of owned capital, ploughed back profits, other long term and short term capital that is indicated on the balance of payment accounts. Alfaro, Chanda, Kalemli-Ozcan and Sayek (2004) show that FDI contributes significantly to economic growth. This variable is controlled for due to its impact on growth.

Data source for this analysis is WDI (2014). The study covers ninety-three (93) developing countries in the world. The sample for this study are countries that have data on level of financial literacy. The list of the 93 developing countries is presented in Appendix 3.

3.4 Method of Analysis – Financial Literacy, Financial Institutions and Financial Inclusion

3.4.1 Model Specification

The model to assess the function of financial institutions in financial literacy and financial inclusion is based on the model used for analyzing the finance-growth relationship presented by

Levine (2005); and Aghion and Howitt (1998). The model is usually specified in the panel or cross sectional form:

$$g_i = \beta_0 + \beta_1 \text{Findev}_i + \beta_2 X_i + \mu_i \quad (19),$$

where g_i is the mean growth rate in country i for a period, Findev_i represents the extent of level of financial expansion in a country, X_i denotes a set of controls (usually beginning income per capita, education, policy variables and political stability) and μ_i is a disturbance term. While they used this model to investigate the link between financial development and growth using cross sectional data of countries, this study applies this model to investigate the mediating influence of financial institutions on financial literacy and financial inclusion. The model is similar to that of the causal step method to mediation analysis suggested by (Baron & Kenny, 1986) and the bootstrapping technique by (Preacher & Hayes, 2004).

Mediation model offers an explanation for how or why two variables are connected where a third variable, M is hypothesized to have an indirect effect in the relationship between an independent variable, X and a dependent variable, Y . Mediation analysis seeks to identify and explain the channel through which an independent variable influences a dependent variable through a third variable called a mediator. Mediation model suggests that an independent variable (financial literacy) impacts a dependent variable (Financial inclusion) through the non-observable mediator variable (Financial institutions). Hence, the mediator explains the nature of the nexus between the dependent and independent variables. That is, how financial institutions influence financial literacy to achieve financial inclusion.

The model for the analysis of this study becomes:

$$FI_i = \alpha_1 Finlit_i + \alpha_2 FinInst_i + \alpha_3 C_i + \varepsilon_i, \quad i = 1, 2, \dots, N) \quad (20),$$

where, FI is Financial inclusion, the dependent variable;

Finlit is financial literacy, main independent variable;

FinInst represents each of the financial institutions which are pension and insurance institutions, commercial banks, micro-finance institutions and central bank;

C represents a set of control variables. These are information technology – use of internet, level of secondary education, per capita income, regulator’s strength of enforcement and population density.

ε is the error term which captures unspecified independent variables. The error term varies across countries. The error term has a zero population mean; observation in the error term are uncorrelated with each other; it has a constant variance and it is normally distributed.

α_1 , α_2 and α_3 are the coefficients of the independent variables.

According to Baron and Kenny (1986), mediation study involves the estimation of three main equations: firstly, regress the independent variable(s) on the dependent variable; secondly, regress the independent variable on the mediator; then finally regress both the independent and mediator variables on the dependent variable. The equations to be estimated to analyze the mediating effects of financial institutions in enhancing financial literacy to achieve financial inclusion are equations 21, 22 and 23 as follows:

$$FI = \alpha_0 + \alpha_1 Finlit + \alpha_2 C + \varepsilon \quad (21),$$

Mediation analysis starts with a linear regression as indicated in equation 21, where FI represents dependent variable; β_0 denotes y-intercept or value of FI when the independent variables (FinLit and Controls) are zero, that is the level of financial inclusion when there is no financial literacy and any control variables. β_1 is the coefficient or slope or how much FI changes for each unit increase in Finlit and Controls, that is how much does financial inclusion change as financial literacy and the control variables increases. Finlit and C are the independent and control variables respectively. ε is the error term which takes care of how the relation between independent and dependent variables may differ for countries.

The purpose of estimating equation (21) is to establish how the independent variable (financial literacy) affect the dependent variable (financial inclusion). In mediation analysis, this is referred to as the c path which denotes the total effect. In other words, the total effect of financial literacy on financial inclusion is represented by the ‘c’ path. Baron and Kenny (1986) suggests that X (Finlit) should be a significant predictor of Y (FI) on ‘c’ path. They suggest that insignificant nexus between X and Y give indication that mediation assessment is not necessary. However, (Shrout & Bolger, 2002) intimate that in the absence of significant association between X and Y, there is still the need to continue with the estimation because the emphasis of the analysis is on the indirect effect and not the direct effect in addition to a good theoretical background about the relationship between X and Y.

The next step is to regress the independent variables (Finlit and Controls) on the mediator (X) as given by equation 22:

$$X_i = \alpha_0 + \alpha_1 \text{Finlit}_i + \alpha_2 C_i + \varepsilon_i \quad (22),$$

The purpose of this estimation is to demonstrate that the independent variables significantly predict the mediator which is each of the financial institutions. It is expected that the independent variables significantly predict the mediator on 'a' path. This 'a' path shows the effect that the independent variables have on the mediator. If there is no relationship between the mediator and the independent variables, the mediator variable could just be another variable that may or may not be related to the dependent variable. Thus, mediation is meaningful only if the independent variable affects the mediator. Equation 23 is the next estimation in mediation analysis.

$$FI_i = \alpha_0 + \alpha_1 Finlit_i + \alpha_2 X_i + \alpha_3 C_i + \epsilon_i \quad (23),$$

In equation 23, regress the independent variable(s) and mediator on the dependent variable to ascertain whether the mediator predicts the independent variable significantly; and the earlier significant independent variables in equation 22 has declined and is insignificant. It is expected that the mediator would influence the dependent variable, but the independent variables to no longer influence the dependent variable or the independent variables to still affect the dependent variable but in a smaller magnitude. Thus, the mediator should significantly predict the dependent variable on 'b' path. Path 'b' depicts the effect that the mediator has on the dependent variable. If there is mediation effect, the impact of the independent variables on the dependent variable will vanish or be weak as the mediator is added to the model. The influence of the independent variables (X) passes through the mediator.

It must be noted that if the influence of X on Y totally vanishes, the mediator entirely mediates between X and Y which suggests full mediation. Nonetheless, if the influence of X on Y is present in reduced size, the mediator partly mediates between X and Y, hence there is partial mediation.

Partial mediation exists when the direct effect is still significant after adding the mediator to the regression equation.

Decomposition of effects

To conclude whether there is full or partial mediation, there is the need to break down the total impact into direct and indirect. The total impact (c) presents the overall impact of the independent variable on the dependent variable and this is made up of the direct link between the independent variables (X) and the dependent variable (Y); and the link between X and Y through the mediator (M). The (c') is the influence of the independent variable on Y controlling for M . It also exemplifies direct effect which is the relationship between the X and Y without a mediator.

3.4.2 Estimation Technique

The study applies the Ordinary Least Squares estimation technique which requires that the error term (ϵ_i) satisfies classical assumptions. The error term has a set of assumptions about it. These are:

1. The errors have zero mean; $E(u_t) = 0$. Thus given any values of the independent variables which are exogenous, the error term must have an expected value of zero.
2. The variance of the errors is constant and finite over all values of x_t ; $\text{Var}(u_t) = \delta^2$. This suggests that there should be no heteroscedasticity but rather homoscedasticity.
3. The errors are statistically not dependent of one another; $\text{Cov}(u_i, u_j) = 0$
4. There should be no relationship between the error and matching x variable; $\text{Cov}(u_t, x_t) = 0$, for i is not equal to j . Hence, there should be no perfect collinearity.

If these four assumptions are satisfied, then the estimators ($\hat{\alpha}$ and $\hat{\beta}$) determined by the ordinary least squares are referred to as best linear unbiased estimators as indicated by the Gauss-Markov theorem. These properties of the OLS estimator suggest the OLS estimator of the sample has a smallest variance amid the group of linear non-biased estimators. Unbiased because the real value of the estimators ($\hat{\alpha}$ and $\hat{\beta}$) will be the same as the true values. It is said to be linear because the sample estimator ($\widehat{\beta}$) is a linear estimator. Linearity suggests that the model is linear in its parameters. Finally, the sample estimator $\widehat{\beta}$ is an estimator of the true value of the population β .

To be able to make an inference about the parameters of the population (the actual α and β) from the parameters of the sampled ($\hat{\alpha}$ and $\hat{\beta}$), u_t need to have a normal distribution and the OLS estimators also have to satisfy the conditions of efficiency, unbiasedness and consistency. The estimators $\hat{\alpha}$ and $\hat{\beta}$ are said to be consistent when the estimates converges at their real values as the sample size rises to infinity. Consistency implies that

$$\lim_{n \rightarrow \infty} [|\widehat{\beta} - \beta| > \delta] = 0 \quad \forall \delta > 0 \quad (24),$$

The estimates of $\hat{\alpha}$ and $\hat{\beta}$ are unbiased when $E(\hat{\alpha}) = \alpha$ and $E(\hat{\beta}) = \beta$. Hence, on the whole computed values will be the same as the real values. However, to attest this requires an assumption that $E(u_t) = 0$. This suggests that unbiasedness is a studier condition compared to consistency. An estimator $\hat{\beta}$ of parameter β is efficient if it is not biased and no other not biased estimator has a lesser variance. If the estimator is efficient, the prospect that it is distant from the real value of β is minimized. OLS is efficient when there is small variance or at least the smallest possible variance for unbiased linear estimators.

3.4.3 Test of Significance

Usually, social science researchers are interested in examining how some independent variables affect a given dependent variable. The goal of this study is to go beyond the estimation of independent variables on a dependent variable and probe the channels by which the independent variables create the impacts. This process is known as mediation effect in the statistics literature (Pearl, 2012; Imai, Keele, Tingley, & Yamamoto, 2011; Imai, Keele, & Tingley, 2010). Mediation study have been applied in economics for many years (Theil, 1958; Klein & Goldberger, 1955; Sewall Wright; 1921; 1943). The objective of mediation analysis remains to unravel the mean impact on outputs that works via two conduits which are the indirect output impact emanating from the impact of treatment on some inputs; and the direct output impacts that operates via conduits other than variations in measured inputs. Mediation analysis usually focuses on the indirect effects rather than the direct effect.

After these relationships have been established, there is the need to determine if the mediation effect is partial or full (that is different from zero or not). To test for statistical significance one can use either Sobel test (Sobel, 1982) or bootstrapping approach (Preacher & Hayes, 2004). This paper uses the bootstrapping approach because it overcomes the challenges of the Sobel test and is strongly recommended in recent years. To test for significance in mediation analysis, one has to account for the indirect influence of X and Y which is given as 'a' path multiplied by 'b' path. When the indirect influence is significant, mediation has occurred. When the indirect influence is significant and the direct influence remains significant, partial mediation has occurred. When the indirect influence is significant, and the direct effect is not significant, full mediation has occurred.

3.4.3.1 Bootstrapping

To investigate the mediating role of financial institutions on financial literacy and financial inclusion, the study employs the bootstrap approach to examine the relationship. The bootstrap procedure by Efron (1987) and; Efron and Tibshirani (1993) is a means of estimating the statistical accuracy from the data in a single sample by resampling from the same sample. It is used to mimic the process of selecting many samples when the population is small and samples are generated from the same data in the original sample multiple times. Bootstrapping is a technique of making standard errors robust by estimating the sampling distribution of an estimator by resampling with replacement from the initial sample. It uses replication of the original data to stimulate larger population, thus allowing many samples to be drawn and statistical tests to be calculated. The results generated from the bootstrap sample can be treated as if they were the results of actual sampling from the original population.

Some of the merits of bootstrapping are that it offers a straight forward approach to determine approximations of standard errors and confidence intervals for multifaceted estimators of intricate parameters of a distribution. Secondly, it is a suitable method to control and determine the stability of outputs. In addition, bootstrap is asymptotically precise than the standard intervals derived from applying sample variance and assumption of normality. It is particularly relevant in situations when there is no methodical approach for sampling the distribution and it allows for more accurate forecast and yields superior results. There are no assumptions about the population, variance and error terms in bootstrapping. The applications and uses of bootstrapping cuts across fields such as criminology, actuarial practice, ecological studies, human nutrition and outsourcing.

3.4.3.2 Step by Step Procedure of Bootstrapping Used in this Study

Since bootstrapping focuses on doing inference on the population parameter using the sample parameter, the study uses the following procedure for the bootstrap estimation as suggested by Hesterberg (2015).

1. Bootstrapping treats the actual distribution as a proxy for the true distribution. Hence, a representative sample of n observations was derived from the population.
2. It resamples with replacement from the original sample of size n to create a bootstrap sample of the same size n . The resampling was done with replacement of the actual distribution using the one-sample bootstrap with the simple random sampling 5000 times to get the bootstrap sample. With the one-sample bootstrap, observations are drawn with replacement from the original data to create a bootstrap sample. The bootstrap statistics are calculated for each sample. The bootstrap statistics comprise the bootstrap distribution. Each of the bootstrap distribution is made up of the following summary statistics: the observed, standard error, mean, confidence intervals and bias about the corresponding sampling distribution.
3. Compute the statistic of interest on each bootstrap sample to get an estimate of the distribution.
4. Use the distribution of the sample to estimate properties of the sampling distribution of the population.

The details of the procedure of the bootstrap is explained as follows:

Plugging in

The bootstrap is based on the plug-in principle. This suggests that if something is not known, one can substitute an estimate for it. For example, given that the standard deviation of the sample mean is σ/\sqrt{n} ; when σ is unknown one can substitute an estimate s , the sample standard deviation. The bootstrap approach expands this principle of plugging in an estimate for a single parameter by plugging in an estimate for the whole population. The bootstrap idea draws samples from an estimate of the population and computes the statistic of interest for each sample.

Approaches for Plugging in

This study uses the nonparametric approach for plugging in an estimate for the whole population. This is the most common procedure which consists of drawing samples from the empirical distribution samples with replacement from the data.

The Basic Principle of Bootstrap

The fundamental bootstrap principle is that the substitution usually works by plugging in an estimate for the population, then the sample and the resulting bootstrap distribution provides useful information about the sampling distribution. The bootstrap uses a sampling distribution to estimate things about the sampling distribution. It must be noted that the bootstrap distribution differs from the sampling distribution. The bootstrap distribution is centered at the observed statistic, not the population parameter.

Resampling Methods

A key bootstrap idea is resampling a number of times from the same sampling. This means drawing samples with replacement from the data. However, resampling is one pair of implementation details. The other implementation detail is substituting the empirical distribution for the population. However, substituting the empirical distribution for the population comes first and using random sampling is second. Alternatives for resampling include analytical methods (e.g., where one can calculate the mean and variance of the bootstrap distribution analytically) and exhaustive or theoretical calculations or bootstrap. Exhaustive bootstrap is implemented if there are n^n possible bootstrap samples from a fixed sample of size n , if order does not matter, or when there are fewer data (e.g. binary data). If n is small one can do the evaluation using an exhaustive bootstrap or theoretical bootstrap. However, exhaustive methods are often not feasible, so one can use the Monte Carlo sampling implementation where one draws 10,000 or 5000 random samples instead.

Sampling

This study uses the exhaustive or theoretical bootstrap by applying the Monte Carlo sampling implementation approach which draws 5,000 random sample from the same sample to estimate how large standard errors would be with that sample size, using the simple random sampling. It must be noted that the reason for sampling from the same sample size as the initial data is to ensure that the standard errors reflect the actual data instead of a hypothetical larger or smaller dataset. Hence, the bootstrap distribution reflects the original sample.

Confidence Intervals

Interpretation of the estimates from the bootstrap estimation was done using the bootstrap percentile interval which is generated by the Stata software. The bootstrap percentile interval handles skewed populations better but can be less accurate for small samples because it is too narrow. However, some software corrects for the small-sample problems and this makes the output reliable.

Table 9: Definition of Variables and Expected Sign

Variable	Variable Explanation	Definition	Expected Sign	Data Source
		Dependent variables		
FI	<i>Financial inclusion</i>			
	Formal account	Ownership of bank account		Global Findex (2014)
	Formal saving	Savings on a bank account		Global Findex (2014)
	Formal credit	Use of bank credit		Global Findex (2014)
		Independent Variables		
Finlit	<i>Financial literacy</i>	Percentage of 15 years and above who are financially literate.	+	S & P Global Financial Literacy Survey (2014)
X	<i>Financial institutions</i>			
	Commercial banks	Number of branches per hundred thousand adults.	+	
	Pensions	Percentage of labour force covered by pensions.	+	World development Indicators
	Insurance	Gross life & non-life premiums per GDP%	+	Africa Development Bank Group
	Micro-finance Institutions	Number of branches of M FIs per hundred thousand adults.	+	World Development Indicators

	Central bank	Growth in money supply	+	International Monetary Fund
C	Control Variables			
	Information technology-Internet Use	Percentage of individuals using internet.	+	World Development Indicators
	Level of secondary education	Net enrolment rate, secondary, both sexes (%)	+	World Development Indicators
	Per capita income	GDP per capita, PPP (Current international \$)	+	World Development Indicators
	Population density	Population density (per square kilometer)	-	UNdata

Note: The variables in Table 9 are used in equations (21), (22) and (33) to examine the mediating role of financial institution on the relationship between financial inclusion and financial literacy.

3.4.4 Justification of Variables

Financial inclusion is the dependent variable and this is proxied by owning bank account, saving at a bank and using bank credit. These variables are chosen because they are main indicators that are used to assess the access and usage of financial services. For instance, Zins and Weill (2016) used these indicators in evaluating the determinants of financial inclusiveness in Africa. Consistent with the study of Demircuc-Kunt and Klapper (2013); and Hannig and Jasen (2010), this paper uses indicators of access and use of financial products with emphasis on saving, borrowing and owning an account at a financial institution.

Financial literacy is measured by percentage of adults who are financially literate. This variable is based on four questions that test basic numeracy and comprehension of interest compounding, inflation and risk spreading. The results of each of these components are averaged to indicate the percentage of adults who are financially erudite per country. It is expected that as financial awareness increases; it will improve financial inclusion.

Due to the intermediation role financial institutions play, they can be a channel/conduit to transmit financial education to achieve inclusion. Commercial banks are chosen because they are the largest depository institution that reach out to the population to enable them hold accounts. When there are more branches per 100,000 adults, proximity and access to financial services become more convenient and more people are inclined to engage in the financial market and make it more inclusive.

Micro-finance institutions (MFIs) provide financial products to segments of society that are cannot access funds from banks. A greater amount of MFIs branches to 100,000 adults suggests that access points are closer to the poor and vulnerable who are not able to patronage main stream banks due to some limitations. Nearness of MFIs to the people will probably encourage the patronize financial products and enhance financial inclusion.

Both life and non-life insurance can create awareness about savings and the need for personal security that can help reduce risk and shore up financial inclusion. Insurance premium to GDP measures insurance penetration (which compares insurance sales volume) in an economy. The ratio is an indicator of insurance sector development and it measures that contribution of insurance premiums to GDP. This variable represents insurance spending and demonstrates the prominence insurance industry in a domestic economy. It is included to measure the role of insurance in an economy. The expectation is that higher insurance contribution will spur financial inclusion.

The goal of pensions is to support working individuals in their old age so that they do not become poor or too dependent on others. As workers transfer income from their working life into the future they build a nest-egg. Paying pensions to retired workers through convenient and innovative means (use of mobile accounts and bank account close to them) to ensure safety of their funds is relevant to financial inclusion. In addition, pension institutions can extend social security programmes to those in the informal sector to widen the net of pension programmes and the number of contributors and beneficiaries of social security. Since the size of the population who work in the informal sector in Africa is large extending pensions to the informal sector will increase the base of participants in the financial system. Though this category of workers may not have guaranteed income, pension institutions can design products that enable them to contribute daily or weekly which can be lumped together at the end of the month to serve as monthly contributions. In addition, pension institutions can educate both contributors and pensioners about prudent use of money and taking financial decisions can help build a more secured future. As the number of labour force (both formal and informal) sector covered by pensions increase, financial inclusion may increase.

Financial inclusion is relevant for Central banks because it has implications on monetary and financial stability. Better financial inclusion enhances the outcome of the use of interest rates as a monetary policy tool, increases the number of depositors and enables broad based lending which contributes to financial soundness (www.afi.global.org). Since one of the main objectives of central banks is to enact and execute monetary policy which seeks to achieve and maintain stability of prices, they have an important responsibility in ensuring financial inclusion. Without financial inclusion in the long term, financial stability may be challenging to achieve because diversified

deposit base and credit portfolios, greater scale and efficiency and increased economic stability promote financial stability (Ferrand, 2016).

One of the measures of Central banks performance of its monetary policy is monetary aggregates. Broad money growth (annual %) which is a measure of money supply is used as a proxy for central banks role in financial inclusion. It is relatively the most inclusive method of determining a given country's money supply and also a measure of financial depth (Kargbo & Adamu, 2009; Adenuga & Omotosho, 2012). It is expected that greater financial depth is would promote greater financial inclusion. Further, central banks can also promote financial literacy by establishing standards that offers protection to users of financial product and also act as supervisors.

The control variables – Information technology – internet use, level of education, GDP per capita income and population density - are factors that equally influence financial inclusion in addition to financial literacy and financial institutions. For instance, Information & Communication Technology - measured by the number of people per 10,000 who have access to internet – can be used to provide services like branchless banking, mobile banking and e-money which are offered by commercial banks to promote financial inclusion (Peachy & Roe, 2006). Thus, ICT supports banking sector initiatives and services delivery as well as a change in how services are delivered to its customers enhance financial inclusion.

Level of education proxied by net enrolment rate, secondary, both sexes influence financial inclusion in a positive way as indicated in studies by Demirguc-Kunt and Klapper (2012) and Arora (2011). As level of education increases, financial inclusion is likely to increase. This variable in included in the model because studies have shown that level of education may not be related in

any way to level of financial literacy because there are people who are highly educated but has low financial literacy levels and vice versa (Lusardi, 2008).

GDP per head measures the performance of a country in terms of economic growth or simply put, it is the average amount of money each person makes and it is indicative of the standard of living of a country. GDP per head (PPP based) is GDP changed to US dollars at purchasing power rates divided by total population. Per capita income measures the average income earned per person in a given country. The expectation is financial inclusion would improve standard of living as shown by the 2012 Global Findex database that economies with greater per head income are associated with higher financial inclusion.

Population density is the measure of the number of people that make up a population in a defined area. The database of the 2012 Global Findex shows that countries with higher density are associated with greater levels of financial inclusion.

3.5 Data Sources

Data for financial inclusion (the dependent variables) was sourced from the Global Findex (2014). The Global Findex provides indicators about demand aspect of financial inclusion in 143 countries across 150,000 households worldwide. Data on financial literacy is from the S and P Global Financial Literacy Survey. This offers a widespread measurements of financial literacy currently available worldwide. The S and P survey investigates four fundamental financial thoughts namely compound interest (saving), risk diversification, numeracy (debt) and inflation. It covers more than 150,000 adults in 144 countries that met the Gallup quality standards. Other sources of data include

World Development Indicators, IMF Financial Access Survey, African Development Bank and UNdata.

3.6 Sample

The study samples forty-four countries in Africa. These are Algeria, Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Central African Republic, Chad, Comoros, Congo D.R, Congo Rep., Cote d'Ivoire, Djibouti, Egypt, Ethiopia, Gabon, Ghana, Guinea, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mauritius, Morocco, Namibia, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, Somalia, South Africa, Sudan, Tanzania, Togo, Tunisia, Uganda, Zambia and Zimbabwe. The sample is based on data availability.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Introduction

This chapter presents the results and analysis based on the methodology discussed in Chapter Three. The results are organized according to sections based on the objectives of the thesis. The chapter begins by presenting the output of the financial inclusion and inclusive growth indices in sections 4.2 and 4.3 respectively. Section 4.4 presents the results and discussions on the nexus between financial inclusion and inclusive growth. The relationship between financial literacy and inclusive growth is outlined in section 4.5. The next section (4.6) discusses the results on the mediating role of financial institutions between financial literacy and financial inclusion.

4.2 Index of Financial Inclusion for Countries in Africa

The first objective of the thesis is to ascertain the extent of financial inclusion using recent data and the level of inclusive growth in Africa; and to investigate the nexus between financial inclusion and inclusive growth. In line with this objective, the financial inclusion index is presented in Table 10. Financial inclusion index (IFI) is computed for thirty-seven (37) nations focusing on the two main dimensions of financial inclusion being access and usage dimensions for 2014. The countries are usually grouped into three (3) main categories – low, medium and high- based on the IFI values. However, the low category is further grouped into very low and extremely low sub-categories in order to provide a detailed outlook of the extent of financial inclusion in Africa. Based on the IFI values: high financial inclusion, $0.5 < IFI \leq 1$; medium financial inclusion, $0.3 < IFI \leq 0.5$; low

financial inclusion, $0.2 < IFI \leq 0.3$, very low financial inclusion, $0.1 < IFI \leq 0.2$ and extremely low financial inclusion, $0 < IFI \leq 0.1$.

Table 10: Index of Financial Inclusion for Countries in Africa

IFI Index Using Computed Weights				IFI Index Using Equal Weights			
S/N	Country	IFI	RANK	Country	IFI	RANK	
1	Kenya	0.390	1	South Africa	0.467	1	
2	Botswana	0.370	2	Kenya	0.463	2	
3	South Africa	0.358	3	Botswana	0.452	3	
4	Uganda	0.315	4	Uganda	0.402	4	
5	Namibia	0.272	5	Namibia	0.366	5	
6	Tanzania	0.248	6	Nigeria	0.326	6	
7	Rwanda	0.247	7	Rwanda	0.321	7	
8	Zimbabwe	0.238	8	Zimbabwe	0.303	8	
9	Cote D'Ivoire	0.230	9	Zambia	0.287	9	
10	Angola	0.227	10	Cote D'ivoire	0.272	10	
11	Madagascar	0.226	11	Tanzania	0.270	11	
12	Sudan	0.218	12	Madagascar	0.270	11	
13	Algeria	0.214	13	Ghana	0.254	13	
14	Zambia	0.208	14	Senegal	0.253	14	
15	Somalia	0.198	15	Mauritius	0.250	15	
16	Sierra Leone	0.195	16	Gabon	0.247	16	
17	Nigeria	0.177	17	Angola	0.247	16	
18	Gabon	0.159	18	Congo, DR.	0.234	18	
19	Mauritius	0.155	19	Mauritania	0.230	19	
20	Congo DR.	0.152	20	Sudan	0.229	20	
21	Senegal	0.137	21	Sierra Leone	0.223	21	
22	Ghana	0.134	22	Cameroon	0.222	22	
23	Mauritania	0.132	23	Chad	0.214	23	
24	Mali	0.125	24	Congo, Rep.	0.212	24	
25	Chad	0.119	25	Somalia	0.210	25	
26	Malawi	0.111	26	Burkina Faso	0.205	26	
27	Burkina Faso	0.110	27	Malawi	0.189	27	
28	Congo Rep.	0.106	28	Benin	0.180	28	
29	Cameroon	0.101	29	Algeria	0.172	29	
30	Tunisia	0.096	30	Mali	0.171	30	
31	Benin	0.092	31	Niger	0.160	31	
32	Togo	0.067	32	Tunisia	0.159	32	
33	Burundi	0.067	32	Guinea	0.154	33	
34	Egypt	0.066	34	Burundi	0.152	34	

35	Niger	0.063	35		Togo	0.138	35
36	Guinea	0.054	36		Egypt, Arab Rep.	0.119	36
37	Ethiopia	0.044	37		Ethiopia	0.077	37

Table 10 presents the results of both the IFI using the computed weights and the IFI using equal weighting. The rationale for using two sets of weighting methods to determine the index is to analyze how robust the index is. The results under the computed weights show that only four countries out of the 37 fall within the medium financial inclusion category with Kenya leading with the highest value of 0.390 followed by Botswana (0.370), South Africa (0.358) and Uganda (0.315) respectively. Ten countries exhibit low financial inclusion with a IFI score ranging from 0.208 – 0.272. These include Namibia, Tanzania, Rwanda, Zimbabwe, Cote D’Ivoire, Angola, Madagascar, Sudan, Algeria and Zambia.

Majority of the countries (15) show very low financial inclusion with an IFI score ranging between 0.101 and 0.198. Eight (8) countries have extremely low financial inclusion with an IFI score that range between 0.044 and 0.096. Ethiopia, Guinea, Niger, Egypt, Burundi, Togo, Benin and Tunisia fall within extremely low financial inclusion category. None of the 37 countries has high financial inclusion. The result shows that on the whole the extent of financial inclusion in Africa is quite low hence, there is the need for a concerted effort that charts new approaches to achieve increased financial inclusion in Africa. This study corroborates the works of Sarma (2008) and Wang and Guan (2016) who also find that the level of financial inclusion among the list of countries in Africa in their data sample is low. It is evident that this study has expanded the scope of indicators used to compute an index to measure the level of financial inclusion by inculcating two new indicators

namely remittances and withdrawals into the index though the results show that the level of financial inclusion in Africa is low which is similar to what other previous studies find.

To test for robustness of the financial inclusion index, we altered the weightiness of the indicators (Cherchye et al., 2007a, b) and; McGillivray and Noorbakhsh (2007) by using the equal weighting method to determine whether there would be significant changes in the grouping of the countries based on their degree of financial inclusion. The results of the IFI scores with equal weighting is presented beside that of the computed weighting method to aid comparison. It can be observed from the results of the equal weighting method that generally the IFI scores are higher compared to the scores of the computed weight method. However, even with these relatively higher results none of the countries fall within the high financial inclusion category that has a range of $0.5 < \text{IFI} \leq 1$. This gives indication that none of the countries in Africa have high degree of financial inclusion. Yet, the number of countries that fall within the medium category increased from the four initial countries to 8 – Namibia, Nigeria, Rwanda and Zimbabwe which were in the low IFI category under the computed weighting method are now in the medium category under the equal weighting method.

In addition, the number of countries that fall within the low IFI category have now increased to 18 with scores ranging from 0.205 to 0.287. Some countries that fall within the very low financial inclusion category under the computed weighting method are now in the low IFI group. These include countries include Burkina Faso, Chad, Senegal, Mauritania, Congo DR, Somalia, Gabon and Mauritius. Moreover, 10 countries fall into the very low IFI group with scores ranging from 0.119 to 0.189. It can be observed that all the countries in the extremely low financial inclusion category under the computed weighting method are now in the very low group under the equal

weighting method except Ethiopia which still remains in the extremely low IFI under both method of weighting with a score of 0.044 and 0.077 respectively.

A test of ranking the financial inclusion index for the countries presented in Table 11 shows that one (1) country – Ethiopia -falls under the extremely low financial inclusion group. Six (6) countries are under extremely low and low quadrants under the respective weighting methods; Three (3) countries fall under the very low –very low quadrants – Mali, Malawi and Benin. Majority of the countries – 12 – are under the very low –low quadrants; 6 countries fall within the very low, low and medium quadrants. Finally, four (4) countries – Botswana, Kenya, South Africa and Kenya fall within the medium quadrant.

Foster et al. (2012) argue that an index is not robust when there is a reversal in the level of the index given a set of weighting methods, hence once the level of an index change (increase or decrease) with a variation in weighting method it suggests that the index is not robust. However, one may contend that since the computed weights for the index consider indicators that are most relevant to Africa's situation, the IFI index under the computed weight is still very relevant. Foster et al. (2012) may debate that the index is not robust. Nonetheless, though there are some variations within the level of index for the countries when the two methods of weighting are compared, the fact remains that the general degree of financial inclusion within the continent stands quite low.

Table 11: Test of Rankings of IFI for Countries

	Equal weights				
	Extremely Low $0 < IFI \leq 0.1$	Very Low $0.1 < IFI \leq 0.2$	Low $0.2 < IFI \leq 0.3$	Medium $0.3 < IFI \leq 0.5$	High $0.5 < IFI \leq 1$
Computed weights					
Extremely Low $0 < IFI \leq 0.1$	Ethiopia	Burundi, Egypt, Guinea, Niger, Togo, Tunisia			
Very Low $0.1 < IFI \leq 0.2$		Mali, Malawi, Benin	Burkina Faso, Cameroon, Chad, Congo DR., Congo Rep., Gabon, Ghana, Mauritania, Mauritius, Senegal, Sierra Leone, Somalia	Nigeria	
Low $0.2 < IFI \leq 0.3$		Algeria	Angola, Cote D'ivoire, Madagascar, Sudan, Tanzania, Zambia	Namibia, Rwanda, Zimbabwe	
Medium $0.3 < IFI \leq 0.5$				Botswana, Kenya, South Africa, Uganda	
High $0.5 < IFI \leq 1$					

One limitation of the computed IFI is that the quality dimension of financial inclusion is not included in the computation of this index due to unavailability of appropriate proxies in the dataset

available. Secondly, due to data unavailability the study could not compute the IFI for all the 54 countries in Africa.

4.3 Inclusive Growth Index in Africa

The study also computes an inclusive growth index to ascertain the extent of inclusive growth in Africa. It uses indicators under five main components. These are: poverty and inequality; growth and extension of economic prospects; social inclusion that safeguard fair access to economic openings; social protection; and good governance and institutions for 2014. The inclusive growth index is presented in Table 12. Groupings of countries is akin to that of the financial inclusion index given as: high inclusive growth, $0.5 < IGI \leq 1$; medium inclusive growth, $0.3 \leq IGI < 0.5$; low inclusive growth, $0.3 < IGI \leq 0.2$, very low inclusive growth, $0.2 < IGI \leq 0.1$ and extremely low inclusive growth, $0 < IGI \leq 0.1$.

Table 12: Inclusive Growth Index for Countries in Africa

IGI Index using computed weights				IGI Index using equal weights			
S/N	Country	IGI	RANK	Country	IGI	RANK	
1	Gabon	0.418	1	Swaziland	0.294	1	
2	Lesotho	0.403	2	Gabon	0.292	2	
3	Sudan	0.385	3	Lesotho	0.294	3	
4	Mauritania	0.308	4	Cameroon	0.284	4	
5	Guinea	0.290	5	Mauritius	0.282	5	
6	Liberia	0.264	6	Malawi	0.278	6	
7	Ghana	0.261	7	South Africa	0.277	7	
8	Senegal	0.256	8	Rwanda	0.272	8	
9	Cameroon	0.251	9	Benin	0.265	9	
10	Swaziland	0.248	10	Senegal	0.263	10	
11	Rwanda	0.247	11	Sudan	0.260	11	
12	Comoros	0.234	12	Burkina Faso	0.254	12	
13	Morocco	0.215	13	Somalia	0.251	13	
14	CAR	0.209	14	Ghana	0.246	14	
15	Egypt	0.197	15	Djibouti	0.234	15	
16	Somalia	0.190	16	Kenya	0.232	16	
17	Botswana	0.176	17	Guinea	0.226	17	
18	Zimbabwe	0.174	18	Togo	0.224	18	
19	Kenya	0.168	19	Tanzania	0.220	19	
20	Benin	0.158	20	Mauritania	0.217	20	
21	Mauritius	0.157	21	Burundi	0.216	21	
22	Zambia	0.151	22	Ethiopia	0.216	21	
23	Namibia	0.150	23	Côte D'ivoire	0.213	23	
24	South Africa	0.149	24	CAR	0.212	24	
25	Congo DR.	0.148	25	Liberia	0.212	24	
26	Tanzania	0.139	26	Egypt, Arab Rep.	0.212	24	
27	Djibouti	0.137	27	Namibia	0.206	27	
28	Tunisia	0.137	27	Botswana	0.204	28	
29	Congo Rep.	0.133	29	Algeria	0.203	29	
30	Mali	0.131	30	Morocco	0.202	30	
31	Algeria	0.129	31	Zimbabwe	0.202	30	
32	Nigeria	0.124	32	Mali	0.200	32	
33	Cote D'ivoire	0.121	33	Congo, Dem. Rep.	0.196	33	
34	Malawi	0.116	34	Tunisia	0.189	34	
35	Burkina Faso	0.106	34	Nigeria	0.179	35	

36	Niger	0.105	36		Angola	0.173	36
37	Angola	0.091	37		Congo, Rep.	0.167	37
38	Togo	0.090	38		Zambia	0.165	38
39	Sierra Leone	0.082	39		Sierra Leone	0.164	39
40	Uganda	0.075	40		Comoros	0.159	40
41	Madagascar	0.058	41		Madagascar	0.155	41
42	Ethiopia	0.044	42		Niger	0.148	42
43	Burundi	0.043	43		Uganda	0.148	42
44	Chad	0.039	44		Chad	0.131	44

Table 12 shows the results of the inclusive growth index using both the computed and equal weighting methods. The results have been presented side by side to facilitate comparison. The result under the computed weights shows that none of the 44 countries for the study fall into the category of high inclusive growth. Four countries fall within the category of medium inclusive growth namely Gabon (0.418), Lesotho (0.403), Sudan (0.385) and Mauritania. Ten countries have low IGI between 0.209 and 0.290. These include Guinea, Liberia, Ghana, Morocco and the Central African Republic. This is indicative that low inclusive growth cuts across all the regions in Africa. Half of the countries (22) have very low scores between 0.105 and 0.197. Countries with very low IGI include Egypt, Somalia, Botswana, Zimbabwe, Kenya, Benin, Mauritius, Zambia, Namibia, South Africa, Congo DR, Tanzania, Djibouti, Tunisia, Congo Rep, Mali, Algeria, Nigeria, Cote D’ivoire, Malawi, Burkina Faso and Niger. Again, the countries with very low IGI spans across all the regions in Africa. Eight countries have extremely low IGI scores between 0.039 and 0.09. Some of the countries within this category are Chad, Burundi, Ethiopia, Madagascar and Uganda. This finding of low level of inclusive growth in Africa is similar to the findings of AfDB (2012) in the study of MENA and other developing countries. That notwithstanding, this study examines all the countries in Africa with data. Hence, the results can be generalized to cover the whole of Africa and not a sub-region in Africa only.

Similarly, to check for robustness of the inclusive growth index, the index was recomputed using equal weighting method. This method attaches equal relevance to each indicator used to compute the index. The results are given in the other part of Table 12. A comparison between the IGI with the computed weights and the one with the equal weighting method shows some differences. When equal weighting is applied to the indicators, none of the countries fall within the high and medium inclusive growth categories. Thirty-two (32) out of the 44 countries fall within the low inclusive growth category with IGI scores that range from 0.200 to 0.294. The remaining 12 countries fall within the very low inclusive growth group with IGI scores between 0.131 to 0.196. None of the countries fall into the extremely low IGI category. The equal weighting method has narrowed the categorization of the countries from medium to extremely low IGI to only low and very low inclusive growth category.

Foster et al. (2012) may contend that a comparison of the IGI using the two methods of weighting gives indication that the index is not robust enough. Again, we argue that since the computed weights depend on the relative importance of the indicators, it is useful to critically assess context before making the robustness argument. If country specific situations are not considered, then it is possible to have an index that is robust in theory but not relevant in practice. Arguably, it is better to have an index that is relevant and gives indication of the degree of inclusive growth outlook but may not be considered robust in theory. A test of ranking of the IGI is presented in Table 13 to verify whether rankings of countries.

Table 13: Test of Ranking of IGI for Countries

	Computed weights				
	Extremely Low $0 < IGI \leq 0.1$	Very Low $0.1 < IGI \leq 0.2$	Low $0.2 < IGI \leq 0.3$	Medium $0.3 < IGI \leq 0.5$	High $0.5 < IGI \leq 1$
Equal weights					
Extremely Low		Angola, Chad, Madagascar, Sierra Leone, Uganda,	Burundi, Ethiopia, Togo		
Very Low		Congo DR, Congo Rep., Niger, Nigeria, Tunisia, Zambia	Algeria, Benin, Botswana, Burkina Faso, Cote D'Ivoire, Djibouti, Egypt, Kenya, Malawi, Mali, Mauritius, Namibia, Somalia, South Africa, Tanzania Zimbabwe		
Low		Comoros	Cameroon, Central Africa, Ghana, Guinea, Liberia, Morocco, Rwanda, Senegal, Swaziland,		
Medium			Gabon, Lesotho, Mauritania, Sudan		
High					

The test of ranking in Table 13 illustrates that none of the countries fall within the category of high IGI of $0.5 < IGI \leq 1$. Five countries – Angola, Chad, Madagascar, Sierra Leone and Uganda – fall within the extremely low and very low category. Burundi, Ethiopia and Togo are within the extremely low and low groups while Congo DR., Congo Rep., Nigeria, Tunisia and Zambia fall with the very low quadrant with IGI score range of $0.1 < IGI \leq 0.2$. Most of the countries (16) and

(9) are within the very low and low; and low and very low quadrants respectively. Only four countries – Gabon, Lesotho, Mauritania and Sudan are within the medium-low IGI score group. This gives indication that irrespective of the rankings of the countries on the IGI scores, the level of inclusive growth in Africa is very low.

A close analysis of the five components of IGI show that for most countries the component of social inclusion to access economic prospect has the highest relative contribution to the index. This suggests that as this component is harnessed potential for growth would be more inclusive. The components of poverty and inequality; and growth and expansion to economic opportunity contribute almost equally to the index. This implies that as the level of poverty and inequality reduces; and economic opportunity increases growth is likely to be broader based. Social protection and good governance have relatively lower contribution to the index. The intuition behind this lower contribution could be that providing social security and health benefits to the population could help them cope with life but not necessarily contribute to the growth process.

4.4 Relationship between Financial Inclusion and Inclusive Growth

This sub-section shows the estimation outputs of the nexus between financial inclusion and inclusive growth. The descriptive statistics and the correlation matrix of the variables are presented in Appendices 1 and 2. The correlation matrix gives indication that the variables are not strongly associated and hence each variable can be included in the model.

The study now presents the results of the nexus between financial inclusion and inclusive growth employing a panel from 2004 to 2014. This period was selected for the analysis because there was

a relatively steadily increase growth in GDP around the world compared to the previous decade. At the same period poverty around the world regions began to relatively decline steadily. The dependent variable – inclusive growth – is decomposed into participation and benefit dimensions. The participation dimension is proxied by employment to population ratio (ETPR) while the benefit dimension is captured by poverty (POV) and inequality (INEQU). The focal independent variables of concern are ACDX and USDX which represent financial inclusion. The added variables are controls that may influence the dependent variables hence, their absence from the model would lead to misspecification of the model due to omitted variable bias.

4.4.1 Nexus between Financial Inclusion and Participation Dimension

The results of the estimation on the link between financial inclusion and participation dimension of inclusive growth is presented in Table 14.

Table 14: Relationship between Financial Inclusion and Inclusive Growth

Variables	FE		
	(1) ETPR	(2) POV	(3) INEQ
ETPR L1.	0.933*** (0.043)		
ETPR L2.	0.053 (0.041)		
POV L1		0.626*** (0.154)	
POV L2		0.276 (0.133)**	
INEQ L1			-0.119 (0.274)
INEQ L2			-0.045 (0.048)
ACDX	0.019*** (0.006)	-0.035 (0.023)	0.715*** (0.208)
USDX	0.000 (0.000)	0.000 (0.000)	0.001 (0.010)
TGDP	0.076 (0.230)	-0.341 (0.887)	2.508 (3.567)
INFL	-0.019 (0.000)	0.000 (0.000)	0.000 (0.000)
AYSC	0.023 (0.016)	0.071 (0.092)	-1.295 (0.951)
LEXP	-0.004 (0.006)	-0.044* (0.025)	-0.805*** (0.221)
FDGD	0.001 (0.003)	0.003 (0.024)	0.041 (0.141)
Constant	0.922 (1.079)	4.000 (2.495)	1.744** (1.833)
Observations	387	395	396
No. of Countries	44	44	44
Sargan test (p-value)	0.934	0.573	0.932
AR (1) p-value	0.142	0.178	0.384
AR (2) p-value	0.525	0.693	0.853

***Significant at 1%, **Significant at 5%, *Significant at 10% Dynamic panel-data estimation, two-step system GMM. (The results in Table 14 are for equations 11, 12 & 13 respectively on pages 105 and 106). *ETPR* is *Employment to population ratio*, a dependent variable and a measure of the participation dimension of inclusive growth. *POV* is *poverty*, a dependent variable and a measure of the benefit dimension of inclusive growth. *INEQ* is *inequality* and another dependent variable for the benefit dimension of inclusive growth. *ACDX* and *USDX*

represent the access and usage dimensions of financial inclusion. TGDP, INFL, AYSC, LEXP and FDGD are the control variables. Please refer to Table 7 for the detailed explanation of the indicators and to pages 105 and 113 for the justification for including these variables in the model. The figures in the parenthesis are the standard errors.

4.4.1.1 Testing Model Adequacy for Dynamic Panel

In order for the results of the estimates to be consistent and efficient but not spurious, the study conducts some diagnostics to ensure model adequacy. The main diagnostics are Sargan test, AR process tests for autocorrelation of the residuals, and the Hausman test.

Sargan /Hansen test

This tests the validity or strength of instruments and over identifying restrictions. The null hypothesis for this test is all instrumental variables are valid or strong while the alternate hypothesis is some of the instrumental variables are invalid/weak. The hypothesis of interest is that the instruments are not correlated with the residuals which suggests valid instruments. If the null hypothesis is not accepted (statistically significant), it suggests that the instruments are not valid. When the p-value of the Sargan test is low or it is significant then it suggests that the instruments may not be valid. In vigorous estimations, the Hansen J statistic rather than Sargan test is reported. It must be noted that when the instrumental variables are larger than the groups, the Sargan test may lose its potency and be weak. The Sargan test statistic fails to reject the instruments used and the validity of the additional instrument. Hence, the test statistics lend credence to the validity of the estimations.

Test for serial correlation

The study used the Arellano-Bond test to find out if autocorrelation exists in the model. The null hypothesis is there is no autocorrelation and this is brought to bear on the differenced residuals. The test for AR (1) in difference usually fails to accept the null hypothesis. The most relevant test is the AR (2) in first difference which identifies autocorrelation in levels. The AR (2) test which is automatically generated by the S-GMM estimator fails to reject the null hypothesis of no serial correlation.

Test for endogeneity

One of the benefits of using the S-GMM is that it corrects for potential endogeneity in the model. To test for endogeneity that makes a case for the suitability of using the S-GMM, the study used the Durbin and Wu-Hausman test. The p-value of the estimates establishes whether a regressor is endogenous or otherwise.

Hausman Test

This is a test that is used to choose amid the fixed effects (Within) and random effects (Between) estimators in a panel model. Ahn and Low (1996) contend that the Hausman test is commended for evaluating the joint proposition of how exogenous and stable the regressors are during a period because the test has good power in detecting endogeneity. The null hypothesis of the Hausman test is there is no correlation between the individual effects and the regressors. When the statistic (observed F-value) is insignificant at 5% or 10% level, one fails to reject the null proposition. When the test statistic is significant, one fails to accept the null proposition of no association between the individual effects and the regressors. The implication of rejecting the null proposition

is that the stochastic effects estimator is inconsistent which suggests that the fixed effects estimator is preferred.

Table 14 reports the two-step variant of Blundell and Bover estimator which gives a more robust and efficient estimates compared to the single-step estimator because the two-step estimator considers the Windmeijer correction especially for system GMM (Blundell, Bond, & Windmeijer, 2001). The first segment (1) in the table reports the outcome of the estimation on the relationship between financial inclusion and the participation dimension of inclusive growth while (2) and (3) are the results of the connection between financial inclusion and the benefit dimension.

Under the results in (1), the coefficients carry the correct anticipated sign. The coefficients of the lagged dependent variable confirm its relevance in the model. There is a significant effect of 0.933 for the first lag which suggests that current employment is significantly influenced by previous employment. This indicates that an increase in employment to population ratio in the previous period would increase that of the current period by 1% and this is significant at 1% level. ACDX shows a positive significant impact on employment. Its measure of 0.019 gives indication that with a unit rise in ACDX, employment is expected to increase by 1.9%, *ceteris paribus*. The implication of this is that as economic units acquire financial products they can make a positive contribution to employment. Hence, access to financial services is likely to contribute to inclusive growth as economic units are enabled to participate in employment.

It is interesting to observe that the USDX does not show a significant impact on employment to population ratio as one would have expected. A possible explanation to this could be that use of financial services and products as indicated by the usage index are for other purposes like

settlement of personal debts rather than using it to embark on productive economic ventures that would generate employment. This suggests that under the period for the study, usage of funds from financial institutions were for other purposes other than productive economic ventures. The TGDP which captures the degree of trade openness of an economy shows a positive but insignificant impact on employment.

Generally, trade openness is expected to influence growth positively so this outcome is consistent with theory. INFL (Inflation) and LEXP (life expectancy) show an inverse relationship with employment while AYSC (average years of schooling) and FDGD (foreign direct investment to GDP) show a direct relationship with employment. The coefficients of the control variables being 0.076, -0.019, 0.023, -0.004 and 0.001 respectively indicate that a unit rise in the independent variable is likely to lead to an increase or a decrease by the unit of the coefficients in the dependent variable, holding all other variables constant. The inverse relationship of inflation with employment is consistent with economic theory which suggests that inflation has the tendency to affect employment negatively when it is relatively high and this is usually the case in most African countries. The negative impact of life expectancy on employment suggests that poor quality of life reduces the contribution to employment. The direct relationship between mean years of education (which is indicative of quality of human capital) and employment is also in line with theory that human capital contributes to employment. In sum, the results of the estimation indicate that access dimension of financial inclusion has significant impact on the participation dimension of inclusive growth positively.

4.4.2 Link between Financial Inclusion and the Benefit Dimension of Inclusive Growth

The results of the benefit dimension of inclusive growth proxied by poverty and inequality as dependent variables is presented under (2) and (3) in Table 14. The output under (2) is discussed. Again, the main independent variables of attention are ACDX and USDX. The coefficients of the independent variables have the predicted signs except for USDX and AYSC. Both the first and second lags of POV show a significant positive impact on the dependent variable which suggests that previous levels of poverty influences current level. The coefficient of ACDX is inversely related with poverty though this is not statistically significant. The discovery is in line with the work of Anwar et al. (2016) in Indonesia which finds that inclusive finance is significantly inversely related to poverty. Therefore, increase in access to finance reduces poverty.

LEXP shows a significant inverse effect on poverty with a coefficient being 0.044 which suggests that a rise in life expectancy by one year will result in poverty reduction by 4.4%, *ceteris paribus*. The implication of this is that as quality of life improves, poverty reduces or as poverty increases, quality of life deteriorates. Trade to GDP shows an inverse relationship with poverty. A coefficient of 0.341 suggests that when TGDP increases by 1% poverty is likely to decline by 34.1% though this is not statistically significant. The relationship between trade openness and poverty is less clear in the literature as empirical evidence on this relationship changes among countries contingent on the economic model and variables of measurement used for the analysis. Although, theoretically trade openness is expected to lead to economic growth which is expected to reduce poverty, this has not occurred in most countries including those in this study. To summarize, the results show that financial inclusion (access dimension) reduces poverty. The usage dimension however, does not show this effect. A probable reason for this could be that accessed finance was

used for purposes such as payment of outstanding debts and social activities that does not improve the lives of the people. This calls for further investigations to ascertain the reasons that accounts for this which is outside the scope of this current study.

4.4.3 Financial Inclusion and Inequality

Finally, the results under (3) of Table 14 is analyzed. This shows the estimations of the link between financial inclusion and income inequality. The theoretical expectation is that financial inclusion will influence inequality to reduce. The argument is that as financial inclusion broadens, economic growth is likely to increase which is expected to reduce inequality as more economic units are assimilated into the financial sector. The results of the estimation reveals that the coefficients of the independent variables do not have the expected signs. The coefficients of mean years of education and life expectancy carry the expected signs while that of access and usage indices do not. The coefficients of ACDX and USDX are positive which suggest a direct relationship between financial inclusion and inequality. Though ACDX shows a significant effect on inequality, USDX shows an insignificant effect. This suggests that as financial inclusion increases, inequality increases. This finding corroborates that of research which have shown that where institutions are weak and access to credit is not inclusive, inequality aggravates because there is bias in financial access in favour of the privileged especially in the era of liberalization (Furceri, 2015).

AYSC (indicator of human capital) and LEXP (indicator of quality of life) are inversely related to inequality as expected however, LEXP is statistically significant at 1% level while AYSC is not. This results submits that as the quality of human capital and life improves, inequality reduces. The coefficients of TGDP, INFL and FDGD show a direct effect on inequality but these are not

statistically significant. This sub-section concludes that financial inclusion did not impact positively on inequality during the period of this study because the result does not show that financial inclusion reduces inequality.

4.5 Financial Literacy and Inclusive Growth

The second aim of the thesis is to investigate the nexus between financial literacy and inclusive growth in Africa relative to developing countries. The analysis assesses whether financial literacy impacts inclusive growth or inclusive growth influences financial literacy. The output of these relationships are presented in Tables 15 and 16.

Table 15: Output of the Nexus between Financial Literacy and Inclusive Growth

Variables	OLS			
	Developing Countries		Africa	
	(1) InETPR	(2) InPOV	(3) InETPR	(4) InPOV
InFINLIT	0.177** (0.077)	-0.166 (0.449)	0.348 (0.324)	0.145 (0.304)
InRGCTGDP	-0.168 (0.095)*	0.258 (0.207)	0.307 (0.228)	0.024 (0.137)
InLE	-0.600*** (0.203)	-3.377*** (0.854)	-01.007 (0.371)	0.874 (0.325)
FDI	0.005 (0.0031)	0.021** (0.0092)	0.208 (0.137)	0.145 (0.113)
Constant	6.396*** (0.000)	17.365*** (3.931)	6.883*** (0.000)	-7.388 (0.669)
Diagnostics				
Observations	87	87	32	32
R-squared	0.193	0.201	0.206	0.33
No. of Countries	87	87	32	32
Root MSE	0.218	0.880	13.237	9.591

***Significant at 1%, **Significant at 5%, *Significant at 10%

Note: Table 15 is the output of the estimation results of equations (15) and (16). *InETPR* is the log of Employment to population ratio, a measure of the participation dimension of inclusive growth. *InFINLIT* is the log of percentage of adults who are financially literate in a given country, a measure of financial literacy. *InRGCTGDP* is the log of government consumption spending to GDP, this variable measures the size of government. *InLE* is the log of Life Expectancy which measures quality of life of the populace of a country. *FDI* is foreign direct investment (net) to GDP, as measure of net flow of investments. *InPOV* is the log of poverty, a measure of the benefit dimension of inclusion growth. Robust standard errors in parenthesis.

4.5.1 Diagnostics

After estimating the four models, different tests are conducted to ensure that the ordinary least squares conditions are met. This is to guarantee that the results are not biased. Test for omitted variables using the Regression Specification Error Test or RESET test of Ramsey (1969) show that there are no omitted variables in the models estimated. The null proposition of the 'ovtest' is there is no omitted variable in the model, the p-value for all the models are greater than of 0.05

(95% significance level) hence, one fails to reject the null proposition and infers that variables in the model are adequate. Similarly, the results of the 'Linktest' which test for model specification show that the models are correctly specified. The key indicator to pay attention to is the significance of χ^2 . The null proposition is there is no specification error in the model. One fails to reject the null proposition if the p-value of χ^2 is insignificant and deduces that the model is well specified. Since the χ^2 of the models range from 0.066 to 0.687 it suggests that the models are correctly specified.

One of the assumptions of Ordinary Least Squares regression model is the that independent variables are not perfectly correlated. Presence of multicollinearity may inflate the standard errors. A test of multicollinearity is the vif (variance inflation factor). A vif larger than 10 or 1/vif smaller than 10% shows that there is a problem. The vif for all the independent variables were less than 10 therefore one can conclude that there is no multicollinearity in the model. The avplots of the variables also indicates that there seem to be no outliers in the data. Outliers can negatively impact the estimates because they are data points with exceptional values. Further, OLS regression model assume normality of the residuals which influences the strength of test statistics p, t, and F. To satisfy this assumption, the Kernel density test of normality was used. The graph of the kernel density seems to show that the residuals do follow a "normal" pattern. The details of the diagnostics of the models for estimating the model are presented in appendix 3.

4.5.2 Financial Literacy and Participation Dimension of Inclusive Growth

To determine whether financial literacy influences inclusive growth following the supply-leading hypothesis, the study uses employment to population ratio (ETPR) as a proxy for measuring

participation dimension of inclusive growth. The semi log functional form of the model was estimated using OLS with robust standard errors. The dependent variable and some of the independent variables are logged in order to reduce the absolute size of the numbers and also to make it easier to figure out impacts in percentage terms. The control variable, foreign direct investment could not be logged because the data contained negative numbers. The robust technique helps to deal with the problem of heteroskedasticity that may exist in the data.

Table 15 (1) reports the results of the impact of financial literacy on the participation dimension of inclusive growth for developing countries. The main variable of interest (financial literacy level) shows a positive impact on employment to population ratio and this is significant at 5% level. The positive coefficient of InFINLIT indicates that a percentage change (increase) in financial literacy level, will lead to a 17.73% change (increase) in employment to population ratio on average. This finding is congruous with the work of Lusardi and Mitchell (2014) which establishes that financial literacy is a form of investing in the labour force which help contribute to economic decision making and output. The positive link between financial literacy and inclusive growth has some implications for policy especially in developing countries where financial awareness is very scant and income poverty levels are also relatively high. It is also relevant to evaluate the extent to which the model fits the data and this is measured by the R-squared. The R-squared of 19.28% from the estimation is low and this can be problematic when one needs to make precise predictions. Since the focus of this study is not to make accurate predictions, a low R-squared does not cause as much concern. The main focus is that financial literacy especially impacts on inclusive growth positively.

The output under (3) demonstrates that though a positive link exists between financial literacy and inclusive growth (participation dimension), financial literacy does not impact inclusive growth significantly. This result is at variance with that of the developing countries reported earlier where financial literacy significantly influenced inclusive growth. Also, it is opposite the findings of Oseifuah (2010) that financial literacy contributes meaningfully to entrepreneurial expansion in the Vhembe district of South Africa and make people participate in the growth process. One reason that could be attributed to this result is that the data for the proxied variable of inclusive growth may have captured the majority of people who work in the formal sector and not for themselves. In this case, being financially literate may not necessary guarantee one employment to enable one contribute to the growth process.

4.5.3 Financial Literacy and Benefit Dimension of Inclusive Growth

The output under (2) in Table 15 reports the results of the linkage between financial literacy and the benefit dimension of inclusive growth proxied by poverty. The dependent variable is poverty, the focal independent variable of attention is financial literacy level and the rest are control variables. The results show a negative connection between financial literacy and poverty though this is not statistically significant. This relationship suggests that higher financial literacy level reduces income poverty. Similarly, a scant extent of financial literacy will lead to increase in poverty level or make people poorer. This finding is consistent with the works of (Disney & Gathergood, 2013; Duca & Kuman, 2014; Gerardi et al, 2010) which show that weak financial knowledge correlates with greater debt burdens, default and delinquency. Hence, lower financial literacy does not promote financial well-being as people are made poorer or worse off. The findings of this study brings to the fore that the policies, programmes and strategies that aim to reduce

poverty in developing countries should not neglect efforts to raise the degree of financial literacy in their respective countries.

The output of the relationship between financial literacy and the benefit dimension of inclusive growth (POV) is presented under (4) in Table 15. The results show that financial literacy does not show a statistically significant effect on inclusive growth (benefit dimension proxied by POV). This result is similar to that of developing countries discussed earlier. However, the direction of the relationship is positive which suggests that a percentage increase in financial literacy level all things being equal will lead to 14.5% increase in poverty. This finding is not only at variance with the expected outcome but also conflicts the findings of Disney and Gathergood (2013) whose study in the USA show that having little knowledge in financial matters is directly linked with higher debt burdens that tend to make people poorer. A plausible reason for the direct relationship between financial literacy and poverty in Africa is that there are not enough opportunities to apply financial literacy skills in productive ventures to enhance one's life. Or it is suggestive that financial literacy is not practically being applied to personal financial decision making like undertaking investments. This could make one undertake inappropriate investments and lose money which would make the person worse off or poorer in the end.

4.5.4 Participation Dimension of Inclusive Growth and Financial Literacy

The study shifts attention from the supply-leading hypothesis to the demand-following hypothesis to analyze the nexus between inclusive growth and financial literacy. The debate on the demand-following hypothesis is that growth generates use of financial products which prompts the financial system to provide more sophisticated services. The provision of these sophisticated financial

products is likely to cause people to learn more about the products and this leads to increased financial literacy levels. This sub-section seeks to ascertain whether the level of inclusive growth (participation dimension) influences financial literacy. The model now uses financial literacy as the dependent variable and the central independent variable of emphasis is employment to population ratio, the proxy for participation dimension of inclusive growth. Table 16 depicts the estimation results of this relationship and shows how inclusive growth influences financial literacy.

Table 16: Results of the Relationship between Inclusive Growth and Financial Literacy

Variables	OLS			
	Developing Countries		Africa	
	(1)	(2)	(3)	(4)
	InFINLIT		InFINLIT	
InETPR	0.302** (0.143)		0.097 (0.100)	
InPOV		-0.132 (0.035)		0.079 (0.640)
InRGCTGDP	0.288*** (0.070)	0.189** (0.074)	0.084 (0.095)	0.114 (0.166)
InLE	0.180 (0.320)	-0.038 (0.361)	0.549 (0.242)	0.392 (0.177)
FDI	0.003 (0.004)	-0.000 (0.003)	-0.079 (0.156)	-0.072 (0.366)
Constant	0.616 (1.573)	3.127* (1.474)	-7.699 (0.669)	3.331 (0.809)
Observation	87	87	32	32
F-Statistic	0.0004	0.024	0.005	0.016
R-squared	0.167	0.087	0.238	0.220
Root MSE	0.284	0.249	6.989	7.071

***Significant at 1%, **Significant at 5%, *Significant at 10%

Note: Table 16 is the output of the estimation results of equations (17) and (18). *InETPR* is the log of Employment to population ratio, a measure of the participation dimension of inclusive growth. *InFINLIT* is the log of percentage of adults who are financially literate in a given country, a measure of financial literacy. *InRGCTGDP* is log of government consumption spending to GDP, this variable measures the size of government. *InLE* is the log of Life Expectancy which measures the quality of life of the populace of a country. *FDI* is foreign direct investment (net) to GDP, as measure of net flow of investments. *InPOV* is the log of poverty, a measure of the benefit dimension of inclusion growth. Robust standard errors in parenthesis

The estimates under (1) in Table 16 illustrate that inclusive growth influences financial literacy positively in developing countries and the association is statistically significant. One can observe that a one percent increase in employment to population ratio will lead to 0.302 percent rise in financial literacy level. Robinson (1952) assertion that “where enterprise leads, finance follows”

supports the finding. Arguably, this result makes intuitive meaning because as the financial well-being of people improve due to participation in meaningful employment, they are able to create wealth through the purchase of financial products and this gives them the motivation to learn more about the mechanics of these products. Hence, to improve financial literacy level, inclusive growth should not be ignored.

The results of the estimation under (3) reports the case for Africa. It suggests that inclusive growth (participation) positively influences financial literacy though statistically insignificant. The finding for Africa is different from that of developing countries where inclusive growth (participation dimension) shows a positive and statistically significant effect on financial literacy. A plausible explanation for this could be that the nature of employment of people may not require the need to sharpen financial literacy skills to improve that work.

4.5.5 Inclusive Growth (Benefit) and Financial Literacy

This sub-section discusses how the benefit dimension of inclusive growth proxied by poverty influences financial literacy applying the demand-following hypothesis. The results are presented under (2) and (4) for developing countries and Africa respectively. The output under (2) gives evidence that poverty is negatively linked to financial literacy but not statistically significant. It implies that high income poverty level leads to a scant extent of financial literacy. This finding is in line with practice because the deprived may not have access to and patronize financial products especially from the formal sector, which can limit their awareness of financial services and other financial matters.

Finally, the output under (4) of Table 16 shows that although a positive association between poverty and financial literacy exist, this is not statistically significant. This is not different from the findings of the results of developing countries though the direction of the relationship is negative for developing countries. Again, this deviation from expected for Africa from developing countries could be due to some characteristics that are peculiar to the African continent.

4.6 The Mediating Role of Financial Institutions on Financial Inclusion and Financial Literacy

This sub-section addresses the third objective of the thesis which seeks to investigate how financial institutions mediate amid financial literacy and financial inclusion. Specifically, it seeks to investigate how financial institutions serve as a channel through which financial literacy can achieve financial inclusion. It presents the estimation results and analysis of how financial institutions mediate between financial inclusion and financial literacy. The extensively employed causal steps approach made popular by Baron and Kenny (1986) is used to examine intervening or mediating variable effects in addition to the bootstrapping technique.

The reason for using the two approaches is that the bootstrapping approach complements the causal steps approach by making up for the limitations in the former. The bootstrap approach is used to test the indirect effect because bootstrapped results is superior and lends more credence compared to the Sobel test. The bootstrap result is reported as a supplement to the causal steps approach rather than instead of it. Multiple regression estimations are used to evaluate each constituent of the mediation model using robust standard errors to control for heteroscedasticity. To test for mediation, the first component of the model is to analyze the effect financial literacy has on

financial inclusion while controlling for the effect of the mediator (financial institutions). The estimation output of how financial literacy predicts financial inclusion is presented in Table 17.

Table 17: Nexus between Financial Literacy and Financial Inclusion

Variable	OLS		
	(1) Account Ownership	(2) Savings	(3) Bank Credit
FinLit	0.212 (0.22)	0.087 (0.13)	0.174*** (0.05)
Internet Use	0.042 (0.15)	-0.019 (0.09)	0.048 (0.03)
School Enrolment	0.188 (0.10)	0.077 (0.66)	0.018 (0.03)
InGDP per Capita	25.812*** (6.77)	11.700** (4.07)	2.123 (1.75)
Population Density	0.047*** (0.01)	0.027** (0.01)	0.012*** (0.00)
Constant	-88.867 (18.83)	-38.170** (11.15)	-10.421* (5.06)
No. of Countries	44	44	44
R-squared	0.678	0.566	0.490

***Significant at 1%, **Significant at 5%, *Significant at 10%

Note: Table 17 presents the results of the estimation of equation (21) which shows the relationship between financial literacy and financial inclusion. Financial inclusion is the dependent variable and it is represented by Account Ownership, Savings and Bank Credit. Finlit is the main independent variable and it is represented by the percentage of adults who are financially literate in a given country. Internet Use, School Enrolment, InGDP per Capita and Population Density are control variables which are proxied by Percentage of individuals using internet; Net enrolment rate, secondary, both sexes (%); GDP per capita, PPP (Current international \$); and Population density (per square kilometer) respectively. Robust standard errors in parenthesis.

The output in Table 17 shows the direct impact of financial literacy on financial inclusion measured as account ownership (1), savings (2) and bank credit (3) without using any channel. The results show that financial literacy significantly influences bank credit but not account ownership or savings. This outcome is in line with the works of Hastings et. al. (2013),

OECD/PISA 2012 and Norma (2010) that suggest financial knowledge enables consumers to make prudent decisions about bank credit. The implication of this is that knowledge of financial concepts like interest rates inform the borrowing decisions of borrowers in order to maximize their welfare.

Though Baron and Kenny (1986) expect the link between financial literacy and the indicators of financial inclusion to be statistically significant to be able to establish mediation, Preacher and Hayes (2004, 2008) argue that even if the results of the direct path which is the relationship amid financial literacy and financial inclusion is not statistically significant, mediation can still be established. In addition, Zhao, Lynch, and Chen (2010) also argue that the strength of mediation is accounted for by the size of the indirect effect and not by the absence of the direct effect. Hence, the existence of a statistically significant impact of financial literacy on account ownership and savings, illustrates that mediation analysis worth exploring. The second equation in mediation analysis by Baron and Kenny (1986) is then estimated.

The second stage of mediation analysis is to regress financial literacy on financial institutions. This estimation seeks to confirm that financial literacy significantly predicts financial institutions usage. It is expected that financial literacy will predict financial institutions which suggests that financially literate people are more probable to patronize services of commercial banks, pensions, insurance and other financial institutions. If financial institutions are not associated with financial literacy, then financial institutions are likely to be another variable that may or may not be linked to financial inclusion. Therefore, mediation appears meaningful if financial literacy impacts use of financial institutions. The result of this estimation is shown in Table 18.

Table 18: Relationship between Financial Literacy and Financial Institutions

Variable	OLS				
	(1) Comm Banks	(2) Pensions	(3) Insurance	(4) Micro- Finance	(5) Central Bank
FinLit	0.087 (0.10)	0.016 (0.49)	0.058 (0.04)	0.176 (0.18)	-0.131 (0.10)
Internet Use	0.063 (0.04)	-0.102 (0.23)	-0.005 (0.02)	0.143 (0.09)	-0.145 (0.09)
Sch. Enrolment	0.036 (0.03)	0.240 (0.18)	0.036 (0.02)	-0.017 (0.05)	-0.078 (0.06)
InGDP per Capita	6.156** (1.94)	40.693*** (10.08)	1.384 (0.94)	14.722 (8.63)	-0.879 (3.33)
Pop. Density	0.011* (0.00)	-0.025 (0.02)	0.001 (0.00)	-0.001 (0.01)	0.007 (0.01)
Constant	-22.916*** (5.59)	-149.399*** (33.17)	-7.364 (3.74)	-51.783* (24.04)	27.213** (8.94)
No. of Countries	44	44	44	44	44
R-squared	0.654	0.611	0.336	0.245	0.233

***Significant at 1%, **Significant at 5%, *Significant at 10%

Note: Table 18 presents the results of the estimation of equation (22) which shows the relationship between financial literacy and financial institutions. Finlit is the independent variable and it is represented by the percentage of adults who are financially literate in a given country. Financial institution is the mediator variable. This is represented by commercial banks, pensions, insurance, micro-finance and central bank. Robust standard errors in parenthesis. Refer to Table 9 for the detailed proxies of these variables.

The results in Table 18 does not demonstrate that financial literacy significantly predicts financial institutions because there is a statistically insignificant impact of financial literacy on the financial institutions. Though this results do not meet Baron and Kenny's requirement that there should be a direct and significant connection between financial literacy and financial institutions, Zhao et al. (2010) argue that it is the indirect effect that matters most in mediation analysis. To evaluate the indirect effect, one has to estimate the parameters (a * b) and observe the distribution of this product since this is the central element in mediation analysis. To determine (a *b), there is the need to estimate equations (21) and (23) as suggested by Baron and Kenny (1986).

Since the emphasis of mediation analysis is on the indirect effect, an insignificant link between financial literacy and financial inclusion does not stall mediation analysis. Zhao and Hayes (2010) further argue that the requirement to demonstrate mediation is a significant indirect effect ($a^* b$) by a bootstrap test by Preacher and Hayes (2004, 2008). The study therefore continues to estimate of the final equation of Baron and Kenny (1986).

The final component of the mediation analysis is to estimate financial literacy, financial institutions and financial inclusion in one model to establish the mediation effect. When financial institutions are included in the estimation model, the influence of financial literacy on financial inclusion is expected to go through financial institutions. Financial inclusion is measured by owing a bank account, savings and bank loans, the results of the output of this estimation are shown in Tables 19, 20 and 21 respectively.

Table 19: Relationship between Financial Inclusions (Account Ownership), Financial Literacy and Financial Institutions

Variable	OLS				
	ACCOUNT OWNERSHIP				
	Comm Banks	Pensions	Insurance	Microfinance	Central Bank
FinLit	0.180 (0.21)	0.048 (0.21)	0.041 (0.18)	0.188 (0.22)	0.239 (0.24)
Comm. Banks	0.364 (0.79)				
Internet Use	0.019 (0.14)	0.074 (0.12)	0.057 (0.12)	0.022 (0.15)	0.072 (0.17)
Sch. Enrolment	0.174 (0.10)	0.112 (0.09)	0.080 (0.09)	0.190 (0.10)	0.204 (0.10)
InGDP per Capita	23.574* (8.78)	12.939 (8.46)	21.713** (6.74)	23.799*** (7.34)	25.995*** (6.76)
Pop. Density	0.043* (0.02)	0.054*** (0.01)	0.044*** (0.01)	0.047*** (0.01)	0.045*** (0.01)
Pensions		0.316** (0.09)			
Insurance			2.962*** (0.71)		
Microfinance				0.137 (0.08)	
Central Bank					0.208 (0.25)
Constant	-80.535** (25.77)	-41.604 (25.83)	-60.058*** (19.17)	-81.784*** (21.35)	-94.516*** (18.19)
No. of Countries	44	44	44	44	44
R-squared	0.682	0.756	0.773	0.687	0.683

***Significant at 1%, **Significant at 5%, *Significant at 10%

Note: Table 19 presents the results of the estimation of equation (23) which shows the relationship between *financial inclusion, financial literacy and financial institutions*. *Financial inclusion, measured by account ownership is the dependent variable. Finlit is the independent variable. Financial institution is the mediator variable. This is represented by commercial banks, pensions, insurance, micro-finance and central bank. Robust standard errors in parenthesis. Refer to Table 9 on page 126 for the detailed proxies of these variables.*

The purpose of the estimation result in Table 19 is to use both financial institutions and financial literacy in a model to confirm that financial institution significantly predicts account ownership

dimension of financial inclusion. The results show that pensions and insurance are statistically significant predictors of account ownership. This suggests that financial inclusion (account ownership) can be achieved when agents use pensions and insurance as a result of being financially literate. This results also gives indication that not all financial institutions mediate financial literacy and account ownership. For instance, financial institutions such as Microfinance and Central bank proxied by broad money growth do not mediate financial literacy and account ownership as shown by the results. It can be argued that central banks do not directly play a role in achieving financial inclusion (account ownership), however, they can initiate policies and establish frameworks which are indirect approaches to achieving both financial inclusion and financial literacy.

Table 20: Relationship between Financial Inclusion (Saving), Financial Literacy and Financial Institutions

Variable	OLS SAVINGS				
	Comm Banks	Pensions	Insurance	Microfinance	Central Bank
FinLit	0.091 (0.13)	0.015 (0.12)	0.012 (0.12)	0.101 (0.13)	0.099 (0.14)
Comm. Banks	-0.047 (0.43)				
Internet Use	-0.016 (0.08)	-0.005 (0.08)	-0.013 (0.08)	-0.008 (0.09)	-0.006 (0.10)
Sch. Enrolment	0.079 (0.06)	0.043 (0.05)	0.030 (0.06)	0.076 (0.06)	0.084 (0.06)
InGDP per Capita	11.991* (5.34)	5.992 (5.21)	9.899* (4.21)	12.885** (4.47)	11.780** (4.13)
Pop. Density	0.027* (0.01)	0.030*** (0.01)	0.026** (0.01)	0.027** (0.01)	0.026** (0.01)
Pensions		0.140** (0.05)			
Insurance			1.301*** (0.31)		
Microfinance				-0.080 (0.05)	
Central Bank					0.091 (0.15)
Constant	-39.252* (15.57)	-17.215 (15.31)	-28.587* (12.07)	-42.336** (12.55)	-40.641** (11.32)
No. of Countries	44	44	44	44	44
R-squared	0.567	0.629	0.641	0.578	0.570

***Significant at 1%, **Significant at 5%, *Significant at 10%

Note: Table 20 presents the results of the estimation of equation (23) which shows the relationship between *financial inclusion, financial literacy and financial institutions*. *Financial inclusion, measured by savings is the dependent variable. Finlit is the independent variable. Financial institution is the mediator variable. This is represented by commercial banks, pensions, insurance, micro-finance and central bank. Robust standard errors in parenthesis. Refer to Table 9 on page 126 for the detailed proxies of these variables.*

Table 20 shows the output of the estimation of financial institutions and financial literacy to predict financial inclusion (savings dimension). Again, as shown in the table pensions and insurance are

significant predictors of savings. Intuitively, this makes meaning because pensions and insurance are direct and indirect ways of saving respectively. Though one may argue that practically the percentage of the population that have pensions and insurance in Africa is relatively small, we opine this finding cannot be overlooked because of the relevance of insurance. The finding here suggests that as pensions and insurance institutions provide services to the populace, financial knowledge would improve and to stimulate financial inclusion (savings).

Table 21: Relationship between Financial Inclusion (Bank Credit), Financial Literacy and Financial Institutions

Variable	OLS				
	Comm Banks	Pensions	Insurance	Microfinance	Central Bank
FinLit	0.179** (0.05)	0.155** (0.05)	0.153** (0.05)	0.188*** (0.05)	0.192*** (0.05)
Comm. Banks	-0.051 (0.17)				
Internet Use	0.052 (0.03)	0.052* (0.02)	0.050 (0.03)	0.059* (0.03)	0.068* (0.03)
Sch. Enrolment	0.020 (0.03)	0.009 (0.03)	0.004 (0.03)	0.017 (0.03)	0.029 (0.03)
InGDP per Capita	2.437 (1.90)	0.611 (1.96)	1.602 (1.75)	3.242 (1.63)	2.241 (1.67)
Pop. Density	0.012** (0.00)	0.013** (0.00)	0.012** (0.00)	0.012*** (0.00)	0.011** (0.00)
Pensions		0.037 (0.02)			
Insurance			0.376* (0.15)		
Microfinance				-0.076*** (0.02)	
Central Bank					0.135* (0.06)
Constant	-11.589 (5.98)	-4.871 (6.18)	-7.652 (5.16)	-14.358** (4.83)	-14.091** (4.98)
No. of Countries	44	44	44	44	44
R-squared	0.492	0.513	0.522	0.545	0.534

***Significant at 1%, **Significant at 5%, *Significant at 10%

Note: Table 21 presents the results of the estimation of equation (23) which shows the relationship between financial inclusion, financial literacy and financial institutions. Financial inclusion, measured by bank credit is the dependent variable. Finlit is the independent variable. Financial institution is the mediator variable. This is represented by commercial banks, pensions, insurance, micro-finance and central bank. Robust standard errors in parenthesis. Refer to Table 9 on page 126 for the detailed proxies of these variables.

Finally, we present the output of the estimation results of how financial literacy may influence financial inclusion (bank credit) through financial institutions in Table 21. The results show that

insurance, micro-finance institutions and central bank (proxied by broad money growth) have statistically significant effect on financial inclusion (bank credit). Also, financial literacy is statistically significant across all the financial institutions. This suggests that financial literacy can be influenced by the use of financial institutions to enhance financial inclusion (Bank credit). In addition, when financial institutions focus attention on creating financial awareness, patronage of financial institutions services would improve and this can shore up financial inclusion (bank credit).

Bootstrapping Test of Indirect Effect

To confirm the results of the causal steps approach to mediation analysis, this section re-estimates equation (23) and tests for the indirect effect using the bootstrap estimation technique by Preacher & Hayes (2004, 2008). Equation (23) is given by $FI = \alpha_1 \text{Finlit} + \alpha_2 \text{FinInst} + \varepsilon$,

where FI is financial inclusion (the dependent variable), proxied by ownership of account, savings and bank credits. Finlit is financial literacy, the independent variable; and FinInsti is financial institutions, the mediating variable given by bank branches, pension funds, insurance companies, micro-finance institutions and central bank.

The estimations are done in Stata using the following commands:

```
sgmediation FI, iv(Finlit) mv(FinInsti)
```

```
bootstrap r (ind eff), reps (5000): sgmediation FI, iv (Finlit) mv(FinInsti)
```

```
estat bootstrap, percentile
```

Since FI is proxied by account ownership, saving and bank credit, each of these was estimated one at a time. Also, the financial institutions – commercial bank, pension funds, insurance companies, micro-finance institutions and central bank – entered the model one at a time. The output of the results from the estimations using the Preacher and Hayes approach shows the total effect along path ‘c’, indirect effect along paths ‘a’, ‘b’, and the total impact along path ‘c’’. The results of these estimations together with the test of significance are presented in Tables 22, 23 and 24.

Table 22: Bootstrap Estimation and Test of Significance – Account Ownership

ACCOUNT OWNERSHIP					
Path	Effect	BootLLCI	BootULCI	SE	P-value
Total Effect (c)	0.673	-0.124	1.469	0.392	0.095
Direct Effect (c')					
Comm Banks	0.167	-0.473	0.808	0.315	0.506
Pensions	0.065	-0.580	0.709	0.317	0.840
Insurance	0.116	-0.548	0.782	0.327	0.723
Microfinance	0.486	-0.273	1.273	0.373	0.020
Central Bank	0.568	-0.267	1.401	0.410	0.175
Indirect effect (a)					
Comm Banks	0.203	-0.001	0.413	0.104	0.059
Pensions	1.242	0.151	2.332	0.537	0.027
Insurance	0.108	0.009	0.207	0.049	0.033
Microfinance	0.374	-0.252	1.000	0.308	0.254
Central bank	-0.264	-0.572	0.043	0.151	0.089
Indirect effect (b)					
Comm Banks	2.493	1.501	3.484	0.488	0.000
Pensions	0.490	0.301	0.679	0.093	0.000
Insurance	5.131	2.974	7.289	1.062	0.000
Microfinance	0.501	0.093	0.908	0.200	0.017
Central Bank	-0.398	-1.290	1.495	0.439	0.372
Total Indirect effect					
Comm Banks	0.506	-0.074	1.212	0.325	0.006
Pensions	0.608	-0.057	1.219	0.331	0.025
Insurance	0.556	0.118	1.215	0.273	0.050
Microfinance	0.187	0.057	1.262	0.337	0.171
Central Bank	0.105	-0.078	0.458	0.137	0.015

Note. Path coefficients, indirect effects, and 95% confidence interval that predicts financial inclusion (N = 44). BootLLCI is bootstrap lower limit confidence interval; BootULCI is bootstrap upper limit confidence interval; SE is standard error.

The results in Table 22 show the output of mediation using bootstrapping approach suggested by Preacher and Hayes (2004, 2008). This approach follows three steps when estimations are done in Stata. The first step evaluates the total effect; indirect and direct effects from the estimation. This step evaluates total effect along path c; the indirect effect along paths ‘a’ and ‘b’ which represents

the portion that relates the independent variable and the dependent variable that is mediated by the mediator; and then the direct effect given by nexus between the independent and the dependent variable without the mediator.

Step two performs the bootstrap analysis by testing the indirect effect and finally step three reports the results of the bootstrap testing of indirect effect ($a*b$). OLS regression analysis is employed to evaluate the premise that financial institutions (commercial banks) proxied by bank branches mediate financial literacy and financial inclusion (account ownership dimension). The results indicate that financial literacy does not significantly predict use of financial institutions (Commercial banks) along path 'a'; $b = 0.203$, $SE = 0.104$, $p\text{-value} = 0.059$ but commercial bank was a significant predictor of financial inclusion (Account ownership) along path 'b'; $b = 2.493$, $SE = 0.488$ and $p\text{-value} = 0.000$ (significant at 1%).

According to the causal steps approach, there cannot be mediation if either the 'a' or 'b' path are not statistically significant. However, with bootstrapping, there can be statistically significant indirect effect (mediation) even when one or both pathways that define indirect effect is not significant. This arguably make the bootstrap technique of mediation analysis an enhanced technique compared to the casual step approach. The results do not support the mediation premise that financial institutions (banks) mediate the impact of financial literacy on financial inclusion because the results of the test of the indirect effect using bootstrap estimation using 5000 samples Shrout & Bolger (2002) show that the coefficient of the indirect is insignificant given that the 95% CI contains zero; $b = 0.506$, $SE = 0.325$, 95% CI = -0.074, 1.212. Hence, the bootstrapping analysis revealed an insignificant indirect effect of financial literacy on financial inclusion via commercial banks. Also, financial literacy does not significantly predict financial inclusion (account

ownership) after controlling for financial institution (commercial banks); $b = 0.167$, $SE = 0.315$ and $p\text{-value} = 0.506$. These results suggest that commercial banks could be an independent or third variable that influence financial inclusion.

Next, the nexus between financial literacy and financial inclusion (Account ownership) is mediated by pensions. The standardized regression coefficient amid financial literacy and financial institutions (pensions) in pathway 'a' was statistically significant; $b = 1.242$, $SE = 0.537$ and $p\text{-value} = 0.027$ as was the standardized regression coefficient between pensions and account ownership along path 'b' given by; $b = 0.490$, $SE = 0.093$ and $p\text{-value} = 0.000$. Financial literacy does not predict account ownership after controlling for pensions; $b = 0.065$, $SE = 0.317$ and $p\text{-value} = 0.840$. The indirect effect using bootstrapping procedures with 5000 bootstrapped samples at 95% CI showed that the indirect effect is statistically insignificant as shown by the results: $b = 0.608$, $SE = 0.331$ and the 95% CI ranged from -0.057 , 1.219 . The result suggests that pensions have insignificant indirect effect on financial inclusion (account ownership).

Insurance is used to mediate the link between financial literacy and financial inclusion (account ownership). The goal here is to examine the role insurance institutions can play in promoting financial literacy to achieve financial inclusion. The estimations in Table 22 show that financial literacy significantly predicts use of insurance as shown by $b = 0.108$, $SE = 0.049$, $p\text{-value} = 0.033$. Similarly, insurance also significantly predicts financial inclusion along pathway 'b'; where $b = 5.131$, $SE = 1.062$, $p\text{-value} = 0.000$. When insurance is controlled for along pathway 'c', financial literacy does not predict financial inclusion anymore given that $b = 0.116$, $SE = 0.327$ and $p\text{-value}$ is 0.723 .

The indirect effect test of significance shows that it is significant given that $b = 0.556$, $SE = 0.273$ and a 95% CI ranges from 0.118 to 1.215 as the 95% bootstrap CI excludes zero which shows that the indirect effect is statistically significant. Hence, in this analysis the bootstrap approach overcomes the challenge of the causal step approach where there can be an indirect effect (mediation) but the criteria for mediation under the causal step approach may not be met under pathways 'a' and 'b' and because of this the analysis is stalled though there is a mediation effect. This result gives an indication that insurance fully mediate financial literacy and financial inclusion.

The results under microfinance section suggests financial literacy insignificantly predicts use of microfinance institutions as shown along the path 'a' by $b = 0.374$, $SE = 0.308$ and a p-value of 0.254. However, microfinance institutions predict financial inclusion as indicated by $b = 0.501$, $SE = 0.200$ and a p-value of 0.017. These results do not fully support the mediational premise that financial institutions (microfinance) mediate financial literacy and financial inclusion as path 'a' is not statistically significant but path b is. When microfinance was controlled for, financial literacy was not significant in predicting financial inclusion (account ownership) given that $b = 0.486$, $SE = 0.373$ and p-value = 0.202. The test of indirect effect shows that the indirect effect is statistically significant as shown by $b = 0.181$, $SE = 0.337$ and 95% CI = 0.057, 1.262. Since the test of the indirect effect shows the coefficient is statistically significant under the bootstrap technique, microfinance institutions can be said to have a significant indirect effect on financial literacy and financial inclusion.

When the function of central bank is explored as a medium for achieving financial inclusion through financial literacy, the results indicate that financial literacy insignificantly predict central

bank along pathway 'a' as shown by $b = -0.26$, $SE = 0.151$ and $p\text{-value} = 0.089$. Also, central bank was not a significant predictor of financial inclusion (account ownership) along path 'b' as given by $b = -0.398$, $SE = 0.439$ and $p\text{-value} = 0.372$. This suggests that central bank is not a channel through which financial literacy can achieve financial inclusion. One reason that could be alluded to explain this finding is that the central bank arguably does not directly stimulate account ownership. Financial literacy is also not a significant predictor of financial inclusion when central bank was controlled for along pathway 'c'' as given by $b = 0.568$; $SE = 0.410$ and $p\text{-value} = 0.175$. Again, the test of indirect effect given by $b = 0.105$, $SE = 0.137$, $95\% \text{ CI} = -0.078, 0.458$ suggests that it is not statistically significant. These findings indicate that the financial institution (central bank) is another variable that influence financial literacy but may have no direct association with financial inclusion (account ownership).

In sum, the evaluation of the mediating effect of financial institutions on financial literacy and account ownership (dimension of financial inclusion) show that some financial institutions such as insurance and microfinance institutions exert significant indirect effect on financial literacy and financial inclusion. The implication of this is that these institutions can be channels to stimulate financial literacy to achieve financial inclusion. Commercial banks, pensions and central bank did not show to be channels to influence financial literacy to achieve financial inclusion. One can argue that this finding support the reality that happens because mostly the poor cannot have access to services of mainstream commercial banks due to some restrictions the poor may be have to face. In addition, signing up for pensions for the future may not be the current priority of the poor hence their limited use of pension institutions. Thirdly, central bank may not have a direct control over financial literacy and financial inclusion. It may therefore be useful to explore commercial banks, pensions and central bank as independent or third variables that can promote financial inclusion.

Table 23: Bootstrap Estimation and Test of Significance - Savings

Path	Effect	SAVINGS			
		BootLLCI	BootULCI	SE	P-value
Total Effect (c)	0.272	-0.128	0.672	0.197	0.176
Direct Effect (c')					
Comm Banks	0.061	-0.000	0.419	0.176	0.730
Pensions	0.103	-0.346	0.367	0.176	0.954
Insurance	0.026	-0.333	0.384	0.176	0.884
Microfinance	0.234	-0.176	0.643	0.201	0.254
Central Bank	0.232	-0.189	0.652	0.207	0.270
Indirect effect (a)					
Comm Banks	0.203	-0.008	0.413	0.104	0.059
Pensions	1.242	0.151	2.332	0.537	0.027
Insurance	0.108	0.009	0.207	0.049	0.033
Microfinance	0.374	-0.252	1.000	0.308	0.234
Central bank	-0.264	-0.572	0.043	0.151	0.089
Indirect effect (b)					
Comm Banks	0.008	0.487	1.594	0.272	0.010
Pensions	0.211	0.106	0.316	0.514	0.000
Insurance	2.272	1.109	3.436	0.572	0.000
Microfinance	0.103	-0.116	0.323	0.108	0.346
Central Bank	-0.153	-0.603	0.298	0.222	0.496
Total Indirect effect					
Comm Banks	0.211	-0.024	0.470	0.134	0.002
Pensions	0.202	0.025	0.565	0.153	0.007
Insurance	0.246	0.048	0.531	1.225	0.023
Microfinance	0.039	0.001	0.540	0.159	0.085
Central Bank	0.040	-0.068	0.223	0.072	0.009

Note. *Path coefficients, indirect effects, and 95% confidence interval that predicts financial inclusion (N = 44). BootLLCI is bootstrap lower limit confidence interval; BootULCI is bootstrap upper limit confidence interval; SE is standard error.*

Table 23 presents the output of the estimation of financial literacy, financial institutions and financial inclusion (savings dimension). The results along the pathways of ‘a’ (showing the influence of financial literacy on financial institutions; ‘b’ (showing the effect of financial institutions on financial inclusion; ‘c’ (direct impact). The results show financial literacy does not

significantly predict of the use of commercial banks as indicated along pathway 'a' which shows how financial literacy influence the use of commercial banks; with $b = 0.203$; $SE = 0.104$ and p-value of 0.059. However, a significant connection exists between financial institutions (commercial banks) and savings along the pathway 'b' as shown by the results $b = 1.04$, $SE = 0.272$ and a p-value = 0.010. This suggests that commercial banks influence financial inclusion (saving dimension) significantly.

The results along pathway 'c', which shows the direct effect of financial literacy on financial inclusion without any channel. It suggests that financial literacy does not influence savings level given that $b = 0.06$; $SE = 0.176$ and p-value = 0.730. This is partly consistent with theory, which gives indication that saving is affected by other factors such as income levels, real interest rate on saving deposit, future expectations, taste and preferences among others. Similarly, the indirect test of significance also shows that commercial banks have an insignificant indirect effect on savings as indicated by the results; $b = 0.211$; $SE = 0.134$ and 95% CI = -0.024, 0.470. Hence, this result confirms that commercial banks do not seem to mediate between financial literacy and savings.

In analyzing pensions as a mediator of financial literacy and savings, the output shows that financial literacy influences pensions along pathway 'a' and pensions also impact savings significantly along path 'b' as given by $b = 1.242$; $SE = 0.537$; p-value = 0.027 and $b = 0.211$; $SE = 0.514$; p-value = 0.000 respectively. Under the direct effect, the estimates suggest that financial literacy does not influence savings. The bootstrap results showing the test of the indirect effect gives indication that pensions show a significant indirect impact on the link between financial literacy and savings as shown by $b = 0.202$; $SE = 0.153$ and 95% CI = 0.025, 0.565. This finding

gives indication that pension institutions can play a central function in financial education of people to improve savings as pensions arguably is a method of saving towards the future.

The estimation output under insurance is very similar to that of pensions. The results indicate that financial literacy impacts insurance significantly along pathway 'a'; $b = 0.108$; $SE = 0.041$; $p\text{-value} = 0.033$. The analysis along path 'b' which shows the relationship between insurance and financial inclusion (Saving) indicates that insurance significantly impacts savings given that $p\text{-value} = 0.000$. However, financial literacy does not seem to have a significant direct influence on savings as shown along the results along path 'c', $b = 0.026$; $SE = 0.176$ and $p\text{-value} = 0.884$. The reason for this is partly grounded in theory, which suggests that other factors influence savings. Finally, the test of significance of the indirect effect suggests that financial literacy significantly exert an indirect influence on savings through insurance as shown by $b = 0.246$; $SE = 1.225$ and $95\% CI = 0.048, 0.531$. The implication of this finding is that insurance institutions can be a useful channel for financial literacy programmes to achieve increased savings for the future. Arguably, insurance can be seen as an indirect way of saving.

The estimates under microfinance institutions shows an insignificant connection between financial literacy and microfinance along pathway 'a' as indicated by the results $b = 0.374$; $SE = 0.308$ and $p\text{-value} = 0.234$. Similarly, microfinance shows a statistical insignificant impact on savings as shown by the estimates along path 'b' with $b = 0.103$; $SE = 0.108$; $p\text{-value} = 0.346$. In addition, the direct effect along path 'c' indicates an insignificant link between financial literacy and savings. This suggests that being financially literate by itself does not lead to savings. However, the test of the indirect effect using the bootstrap approach shows a significant indirect effect of financial literacy on financial inclusion(saving) via microfinance institutions as given by $b = 0.039$;

SE = 0.159 and 95%CI = 0.001, 0.540. It must be noted that having pathways 'a' and 'b' not being statistically significant but the test of significant showing that the indirect effect is significant under the bootstrap approach may give an indication of confounding effect which cancels out and make the variables appear not to have an effect. This challenge is resolved under the bootstrap estimation technique. This finding suggests that financial literacy can be achieved through the efforts of microfinance institutions to achieve financial inclusion (savings). The implication of this finding is that for savings to be improved to enhance the overall financial inclusion, the role of microfinance institutions in promoting financial literacy should not be over looked.

Finally, the results showing how central bank can influence financial literacy to achieve savings is not very different from the role of central bank under account ownership dimension of financial inclusion. Financial literacy significantly impacts the activities of central bank but there is a statistically insignificant relation between central bank and saving given by $b = 0.153$; SE = 0.222 and p-value = 0.496. This suggests that central bank may not be able to impact saving directly but may be through other channels. The estimates of the direct influence of financial literacy on savings also shows an insignificant link between them. Again, test of the indirect effect reveals that financial literacy does not have significant indirect effect on savings through central bank. Hence, central bank may be an independent variable for achieving financial inclusion but not a mediator variable.

To summarize, in analyzing the mediating role of financial institutions amid financial literacy and financial inclusion (saving dimension), the findings are that pensions, insurance and microfinance institutions serve as a channel between financial literacy and savings. Therefore, efforts to accomplish higher financial inclusion need to carefully consider the role of these institutions.

Table 24: Bootstrap Estimation and Test of Significance – Bank Credit

Path	BANK CREDIT				
	Effect	BootLLCI	BootULCI	SE	P-value
Total Effect (c)	0.219	0.054	0.383	0.081	0.011
Direct Effect (c')					
Comm Banks	0.152	0.007	0.311	0.078	0.061
Pensions	0.160	0.010	0.330	0.084	0.065
Insurance	0.151	-0.014	0.317	0.081	0.071
Microfinance	0.223	0.053	0.393	0.083	0.012
Central Bank	0.228	0.054	0.402	0.085	0.012
Indirect effect (a)					
Comm Banks	0.203	-0.008	0.413	0.104	0.059
Pensions	1.242	0.151	2.332	0.537	0.027
Insurance	0.108	0.009	0.207	0.049	0.033
Microfinance	0.374	-0.252	1.000	0.308	0.234
Central bank	-0.264	-5.72	0.043	0.151	0.089
Indirect effect (b)					
Comm Banks	0.330	0.083	0.567	0.121	0.010
Pensions	0.048	-0.002	0.097	0.025	0.061
Insurance	0.023	0.087	1.159	0.263	0.024
Microfinance	-0.011	-0.103	0.080	0.045	0.800
Central Bank	0.034	-0.152	0.220	0.092	0.713
Total Indirect effect					
Comm Banks	0.067	0.010	0.191	0.054	0.000
Pensions	0.059	0.007	0.167	0.064	0.002
Insurance	0.067	0.003	0.215	0.053	0.012
Microfinance	-0.004	-0.025	0.201	0.065	0.033
Central Bank	-0.009	-0.055	0.034	0.022	0.000

Note. *Path coefficients, indirect effects, and 95% confidence interval that predicts financial inclusion (N = 44). BootLLCI is bootstrap lower limit confidence interval; BootULCI is bootstrap upper limit confidence interval; SE is standard error.*

Table 24 shows the estimation outputs of the mediating role of financial institutions on financial literacy and financial inclusion (Bank credit dimension). Again, commercial bank proxied by bank branches and how financial literacy impacts financial inclusion through bank branches is analyzed along pathways 'a' and 'b'. The outcome shows that financial literacy insignificant influence on

commercial banks along path 'a' but commercial banks significantly impacts financial inclusion (bank credit) along pathway 'b' as given by $b = 0.330$, $SE = 0.121$ and $p\text{-value} = 0.010$. Financial literacy insignificantly exerts a direct influence on bank credit at $p\text{-value} = 0.061$. The test of indirect effect shows a statistically results given by $b = 0.067$; $SE = 0.054$ and $95\% \text{ CI} = 0.010, 0.191$. This shows a mediating effect of bank branches on financial literacy and bank credit. The implication of this finding is that as people become financially literate through the education and other activities of commercial banks, they are better able to make a decision to patronize bank credit.

Further, the study also examined how pensions can mediate amid financial literacy and financial inclusion (bank credit). Along the indirect pathways of 'a' and 'b', the results show that financial literacy influences pensions significantly at $p\text{-value} = 0.027$ along path 'a' but pensions do not significantly impact on bank credit given that $p\text{-value} = 0.061$. In addition, financial literacy does not influence bank credit significantly along path 'c' which shows that the direct impact of financial literacy on bank credit. Nonetheless, the indirect effect test shows a statistically significant relationship suggesting that pensions play an indirect role in promoting financial literacy to shore up financial inclusion (bank credit) given that $95\% \text{ CI} = 0.007, 0.167$.

The estimates under financial literacy, insurance and bank credit demonstrates that financial literacy has significant impact on insurance along the pathway 'a' as given by $p\text{-value} = 0.033$; and insurance also has a significant influence on bank credit along pathway 'b' with $b = 0.023$; $SE = 0.263$ and $p\text{-value} = 0.021$. Nevertheless, financial literacy has insignificant direct effect on bank credit when insurance is controlled for along the path 'c'. The result of the test of the indirect

effect indicates that insurance plays a significant indirect role between financial literacy and bank credit as given by $b = 0.067$; $SE = 0.053$ and 95% CI = 0.003, 0.215.

Lastly, the results give indication that microfinance and central bank do not mediate amid financial literacy and bank credit because the indirect effect test is not statistically significant. The 95% CI under the bootstrap approach for microfinance and central bank are -0.025, 0.201 and -0.055, 0.034 respectively. However, when both microfinance and central bank are controlled for, financial literacy exerts a statistically significant impact on bank credit given by $p\text{-value} = 0.012$ along pathway 'c'. These results suggest that microfinance and central bank may be independent variables that affect savings instead of being a channel through which financial literacy passes through to achieve financial inclusion.

It can be concluded from the analysis that though the Baron and Kenny's criteria for the causal step approach to mediation analysis are not met in the analysis, the bootstrap estimation approach shows that even when the criteria of the causal step approach are not met mediation can still exist. For example, when one or both of the pathways that define indirect effect is insignificant under the Baron and Kenny approach, there is still statistically significant indirect impact which is indicative of mediation effect under the Preacher and Hayes (2004). This confirms the argument in the literature that bootstrap approach to mediation analysis is a better technique.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary of the main findings of the thesis based on the objectives of the study. The overarching goal of this study is to examine the relationship between financial inclusion, financial literacy and inclusive growth in Africa. Specifically, it sets out to achieve three main objectives. Firstly, to compute an index to determine the extent of financial inclusion using current data and an index to ascertain the extent of inclusive growth; and to evaluate the nexus between financial inclusion and inclusive growth. Secondly, to investigate the nexus between financial literacy and inclusive growth employing the supply leading and demand following propositions in finance. Lastly, to evaluate the impact of financial literacy on financial inclusion using financial institutions as a mediator variable.

The chapter is organized into six sections. Section 5.2 shows a synthesis of financial inclusion, financial literacy and inclusive growth. Section 5.3 presents the summary of findings. The conclusion and policy implications are offered in sections 5.4 and 5.5 respectively. Section 5.6 shows the contributions of the study. Finally, suggestion for future research is outlined in section 5.7.

5.2 Synthesis of Financial Inclusion, Financial Literacy and Inclusive Growth

Financial inclusion has the potential to ameliorate societal challenges such as poverty, inequality and generation of employment. Financial inclusion is a key pillar of inclusive growth because access to and usage of financial products enable people to embark on productive economic ventures to earn income. This helps in poverty reduction and empower people who were initially involuntarily excluded from the financial system to engage in viable economic ventures and participate in the growth process and make growth inclusive. In addition, financial literacy is relevant to promote access to finance and create an environment that encourage financial conducts such as investing, saving and budgeting which further reinforce financial inclusion.

Further, financially literate people are in a position to make prudent financial decisions, increase their economic security, accumulate wealth and enable them to contribute to economic activities that contribute to growth. Africa falls behind other developing countries in relation to access to finance from the formal financial sector. To improve financial inclusiveness, it is relevant to explore the role of financial literacy as it is arguably the demand side of financial inclusion. One of the agents that can promote financial literacy to improve financial inclusion is financial institutions hence the role of financial bodies such as pension and insurance institutions in addition to banks cannot be over emphasized.

The main problem this thesis pursues to achieve is that though financial inclusion has a potential to help address societal challenges, Africa falls behind other developing countries in financial inclusion because a greater percentage of adults are involuntarily excluded from the financial system. A related issue is high level of poverty on the continent though economic growth has

increased progressively over the ten years with six sixty percent of the world fastest developing economies in the world being in Africa. This near paradox gives an indication that gains from economic growth do not seem to reach the broad masses. This phenomenon suggests that economic growth per se is not enough to reduce poverty. For growth to lead to poverty reduction, it needs to be inclusive where members of a society not only equitably benefit from growth but contribute to it irrespective of their situations. Financial inclusion becomes relevant in achieving inclusive growth because access to financial products enable people to be financially empowered and to embark on economic activities which leads to poverty reduction and contribution to growth. Further, financial literacy has arguably been said to stimulate demand for financial products which improve financial inclusion. Hence, an attempt to improve financial inclusion need to carefully consider financial literacy. The reason for this is that financially literate population is likely to fuel and deepen financial inclusion. The need arises to explore avenues via which financial literacy can be promoted to improve financial inclusion. The role of financial institutions becomes germane.

5.3 Summary of Findings

The first objective of this thesis is to compute an index to determine the extent of financial inclusion using current data and an index to ascertain the extent of inclusive growth; and to examine the relationship between them. The study uses the modified approach of Sarma (2008) to compute the indices of financial inclusion and inclusive growth. To examine the nexus between financial inclusion and inclusive growth, financial inclusion is decomposed into access and usage dimensions. Inclusive growth is also spilt into benefit and participation dimensions. Poverty and inequality are proxies for the benefit dimension while employment to population ratio measures

the participation dimension. The study employs the system generalized moment to analyze this relationship.

For the first objective the main findings are the extent of financial inclusion and inclusive growth in Africa is low. Secondly, financial inclusion (access dimension) exerts significantly positive influence on the participation dimension of inclusive growth at 1%. This suggests that access to finance enables people to contribute to growth. In addition, financial inclusion (access) is inversely related to poverty, although this statistically insignificant. This gives an indication that access to financial products can lead to poverty reduction. Further, financial access positively influences inequality at 1% significance level. This suggests that as people get access to finance inequality reduces. However, the usage dimension of financial inclusion does not significantly influence both the participation and benefit dimensions of inclusive growth. This finding indicates that usage of financial services may be for other purposes other than productive economic ventures. Based on the findings of this research, it concludes that deliberate and aggressive policies need to be undertaken to improve the levels of financial inclusion and inclusive growth in Africa. The reason for this assertion is that the values of the indices for most of the countries were below 0.3 for each. Only few countries in Africa have medium extent of financial inclusiveness and inclusive growth.

The second objective evaluates how financial literacy impacts inclusive growth in developing countries relative to Africa. The study applies the supply-leading and demand-following hypotheses that have been employed to assess the nexus between finance and growth in the finance and economic literature. It seeks to establish whether financial literacy influences inclusive growth or inclusive growth influences financial literacy using robust ordinary least squares regression estimation technique. Results of the supply-leading hypothesis shows statistically significant

positive impact of financial literacy on participation dimension of inclusive growth in the developing countries but this is not the case in Africa. Also, financial literacy inversely correlates with income poverty though this is not statistically significant in developing countries. Yet in Africa, financial literacy positively correlates with income poverty but this connection is insignificant. This suggests that financial awareness can contribute to reduce poverty in Africa.

The finding of the demand-following hypothesis is that the participation dimension of inclusive growth influences financial literacy positively at 5% significance level in developing countries and Africa. This implies that as people engage in viable economic activities and participate in growth they will demand more financing to expand their ventures. This requires that they improve their financial acumen to enable them make prudent financial choices to maximize profits. Nonetheless, the benefit dimension of inclusive growth does not influence financial literacy both in developing countries and Africa.

The final objective is to investigate how financial institutions (commercial banks, pensions, insurance, microfinance and central bank) can be channels to promote financial literacy to improve financial inclusiveness (account ownership, savings and bank credit). To evaluate the intervening effect of financial institutions on financial literacy and financial inclusion study used both the causal approach of mediation analysis by Baron and Kenny (1986) and bootstrap technique by Preacher & Hayes (2004, 2008). Multiple linear regression estimation technique is used for the analysis.

In analyzing the role of commercial banks as a mediator amid financial literacy and financial inclusion, the study finds that commercial banks significantly exert indirect effect on financial

literacy and bank credit but not on account ownership and savings. Therefore, commercial banks serve as a conduit via which financial literacy can be promoted to make sound decisions on bank credit. The analysis further shows an insignificant link between financial literacy and use of commercial banks in all three dimensions of financial inclusion. However, commercial banks are a significant predictor of account ownership, savings and borrowings. Thus, commercial banks mediate financial literacy and bank credit.

The analysis also shows that pensions significantly influence the link between financial literacy and savings and bank credit dimensions indirectly but not the account ownership dimension of financial inclusion. Hence, pensions mediate financial literacy and savings as well as borrowing. Also, the results suggested that financial literacy significantly predict the use of pensions in all the three dimensions of financial inclusion. Similarly, pensions are a significant predictor of account ownership, savings and bank credit. Further, financial literacy does not significantly predict financial inclusion after pensions have been controlled for.

In examining the indirect effect of insurance financial literacy and financial inclusion, the study finds statistically significant indirect effect of financial literacy on financial inclusion (account ownership, savings and bank credit) via insurance. This suggests that insurance is a channel through which financial literacy can achieve financial inclusion. In addition, the assessment of the link between financial literacy and insurance shows that financial literacy has a statistically significant impact on insurance in all the three dimensions of financial inclusion. Also, insurance significantly predicts account ownership, savings and bank credit. However, financial literacy does not significantly impact account ownership, savings and bank credit when insurance is controlled for. Insurance institutions therefore mediate between financial literacy and account ownership, savings and bank credit.

The estimates for the role of microfinance in achieving financial literacy to enhance financial inclusion show that microfinance institutions have a significant indirect effect on financial literacy and account ownership and savings but not bank credit. This gives an indication that microfinance institutions play a mediating role amid financial literacy and owning an account and savings. The estimates also demonstrate that financial literacy does not significantly predict use of microfinance institutions in all the three dimensions of financial inclusion. However, microfinance is a significant predictor of account ownership but not savings and borrowing. Further, financial literacy insignificant influence account ownership and savings when microfinance is controlled for. Yet, financial literacy significantly affects bank credit after controlling for micro finance.

Finally, the results of the estimation for central bank indicate that central bank does not mediate financial literacy and financial inclusion. Nonetheless, financial literacy significantly affects central banks under savings but not account ownership and bank credit. Central bank is also not a predictor of account ownership, savings and bank credit. Lastly, financial literacy significantly predicts bank credit when central is controlled for but not account ownership and savings. The analysis concludes that financial institutions can be channels for promoting financial literacy to achieve financial inclusion – account ownership, savings and borrowing in Africa.

5.4 Conclusion

The thesis brings out some insightful conclusions on the basis of the findings. It provides evidence that though financial inclusion has the potential to promote inclusive growth, the level of financial inclusion and inclusive growth is low. For inclusive growth to be scaled up in Africa, financial inclusion needs to be expanded. One way to do this is to embark on deliberate financial literacy

programme. Low inclusive growth in Africa gives indication that there is low participation of the working population in the growth process and this weakens the base of economic activities that spurs growth. Nonetheless, there is an opportunity to harness the role of other financial institutions to improve financial inclusion through a deliberate financial literacy plan. Low level of financial inclusion and inclusive growth is a threat to the fight of poverty and inequality in Africa.

In addition, it demonstrates empirically that financial access contributes positively to the inclusive growth and also enhances poverty and inequality reduction. Further, financial access reduces poverty and inequality. It is also worthy of note that financial literacy is important and can make positive contribution to inclusive growth in developing countries. Policies, programmes and strategies that are being implemented to promote participation in the growth process and to reduce income poverty and inequality should actively include financial literacy programmes both formally and informally. Similarly, participation dimension of inclusive growth influences financial literacy positively while poverty impacts financial literacy negatively. This gives indication that efforts to improve inclusive growth should not ignore financial literacy and vice versa. Further, the study concludes that apart from banks, non-depository institutions such as pensions and insurance; and microfinance are channels that promote financial knowledge to expand financial inclusion. Hence, the role of these institutions in promoting financial inclusion is very pertinent.

Further, financial literacy is important and can make positive contribution to inclusive growth in developing countries. Finally, both depository and non-depository financial institutions are channels for financial literacy to improve financial inclusion. The unique contribution of this study to the literature are: firstly, it broadens the indicators used to compute financial inclusion index to include remittances and withdrawals. Secondly, it computes an inclusive growth index for the entire Africa by applying a weighting approach that is different from the AfDB approach and this

serves as an alternative method of computing index to the AfDB. This study also broadens the indicators AfDB uses to compute an inclusive growth index by extending the indicators from thirteen (13) to twenty-seven (27). Further, it decomposes inclusive growth into participation and benefit dimensions and empirically tests the relationship between financial inclusion, financial literacy and inclusive growth in Africa. Finally, it makes a case that the definition of financial inclusion in the current literature should be expanded to include the activities of other financial institutions and not be limited to only banks.

5.5 Policy Implications

Some policy implications for these findings are that there is the need for a deliberate concerted effort and the adoption of new approaches to expand the extent of financial inclusion in Africa. For instance, policy makers need to consider developing, implementing and continuously reviewing a national financial inclusion plan in each of the countries in Africa in order to improve financial inclusion.

There is also the need to integrate financial literacy plans that target both the formal and informal sectors of the economy in order to boost the financial inclusion and to promote inclusive growth. One reason policy makers need to take steps to aggressively increase financial inclusion is that financial access increases inclusive growth in the participation dimension. There is also the need for policies that focus on expansion of economic opportunities and provision of access to productive resources in a bid to broaden the base of growth and make it more inclusive.

Policymakers need to consider developing and adding financial literacy curriculum into the mainstream educational curriculum and also explore means to make those who are not in the

formal educational stream financially literate as financial literacy makes a positive contribution to growth. Further, financial institutions need to be encouraged to embark on intentional financial literacy programmes to equip people with basic financial literacy because this financial literacy improves financial inclusiveness which is one of the bedrocks of inclusive growth.

In addition, the scope of financial inclusion need to be examined and broadened in both academia and practice to include the activities of other financial institutions such as pensions, insurance and microfinance instead of predominantly limiting it to banks. The reason for this recommendation is that other financial institutions also play key roles in the financial inclusion process.

To the academia, the scope of financial inclusion need to be expanded to include the activities of other financial institutions such as insurance and pensions instead of limiting the scope to the activities of banks only. Secondly, it is recommended that both the causal step and the bootstrap approaches to mediation analysis should be employed together in mediation analysis as this provides an insightful exposition for appreciating how a mediating variable can influence an independent variable to explain a dependent variable.

5.6 Contributions of the Study

This thesis contributes to both literature and practice in a number of ways: Firstly, it measures the current level of financial inclusion for Africa by computing an index of financial inclusion. This index broadens the indicators used to compute financial inclusion index to include remittances and withdrawals. It also measures the level of inclusive growth index for the entire Africa by computing an index that employs a new weighting approach that is relatively more robust and

serves as an alternative method of computing index to the AfDB. It also broadens the indicators AfDB uses to compute an inclusive growth index by extending the indicators from thirteen (13) to twenty-seven (27).

Secondly, it decomposes inclusive growth into participation and benefit dimensions and empirically tests the relationship between financial inclusion, financial literacy and inclusive growth in Africa. It provides an empirical evaluation of the nexus between financial inclusion and inclusive growth and establishes that financial inclusion positively influences inclusive growth.

Finally, it provides evidence that non-depository financial bodies such as pension and insurance institutions are channels to promote financial literacy to enhance financial inclusion. It makes a case that the definition of financial inclusion in the current literature should be expanded to include the activities of other financial institutions and not be limited to only banks.

5.7 Suggestions for Further Research

To expand the frontier of research on financial inclusion, financial literacy and inclusive growth there is the need to examine the reasons why the usage dimension of financial inclusion does not seem to impact inclusive growth significantly in Africa. In addition, it will be useful to examine how central banks can stimulate financial inclusiveness, financial literacy and inclusive growth in Africa and also examine the effectiveness of the specific structures that are in place to promote financial inclusion, financial literacy and inclusive growth. Another key area to consider is other determinants that impact the different dimensions of financial need to be carefully examined,

investigated and applied together with financial literacy in order to achieve a more holistic financial inclusion for inclusive growth.

Lastly, it will also be relevant to further investigate why financial literacy does not seem to impact inclusive growth in Africa because the findings of the developing countries suggest that financial literacy do influence inclusive growth.

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APPENDICES

APPENDIX 1: Descriptive Statistics for Objective 1

Variable	Obs	Mean	Std. Dev.	Min	Max
ETPR	484	61.74	13.96	34.3	87.7
POV	483	16.21	11.15	0.07	64.5
INEQU	484	43.30	17.28	14	35.5
ACDX	484	5.37	7.69	0.01	42.43
USDY	484	1.50	0.66	-0.63	2.65
TGDP	484	1.85	0.18	1.29	2.51
INFL	484	6.77	11.10	-0.76	24.41
AYSC	484	9.97	2.30	5	15
LEXP	484	57.77	7.38	41.06	74.81
FDGD	484	4.79	7.11	-5.98	84.95

APPENDIX 2: Correlation Matrix for Objective 1

	ETPR	POV	INEQU	ACDX	USDY	TGDP	INFL	AYSC	LEXP	FDGD
ETPR	1.0000									
POV	0.4253	1.0000								
INEQU	0.0423	0.0717	1.0000							
ACDX	-0.4337	-0.4245	0.1423	1.0000						
USDY	-0.1454	-0.2404	0.0235	0.1770	1.0000					
TGDP	-0.2837	-0.0589	0.0538	0.2588	0.1117	1.0000				
INFL	0.0708	-0.0398	0.0049	-0.0017	0.0393	0.0197	1.0000			
AYSC	-0.2047	-0.2437	-0.0946	0.4773	0.3047	0.1674	0.0004	1.0000		
LEXP	-0.2991	-0.4070	-0.2259	0.3582	0.0993	0.1382	-0.0915	0.3530	1.0000	
FDGD	-0.0652	0.1161	0.0047	-0.1110	-0.0896	0.3443	-0.0239	-0.1385	0.0189	1.0000

APPENDIX 3: The list of the developing countries

THE LIST OF THE 93 DEVELOPING COUNTRIES			
Algeria	Africa	Bangladesh	Asia
Angola	Africa	Bhutan	Asia
Benin	Africa	Cambodia	Asia
Botswana	Africa	Georgia	Asia
Burkina Faso	Africa	Indonesia	Asia
Burundi	Africa	Iran, Islamic Rep.	Asia
Cameroon	Africa	Iraq	Asia
Chad	Africa	Jordan	Asia
Congo, Dem. Rep.	Africa	Kazakhstan	Asia
Congo, Rep.	Africa	Kyrgyz Republic	Asia
Cote d'Ivoire	Africa	Lebanon	Asia
Egypt, Arab Rep.	Africa	Malaysia	Asia
Ethiopia	Africa	Mongolia	Asia
Gabon	Africa	Myanmar	Asia
Ghana	Africa	Nepal	Asia
Guinea	Africa	Pakistan	Asia
Kenya	Africa	Philippines	Asia
Madagascar	Africa	Russian Fed.	Asia
Malawi	Africa	Sri Lanka	Asia
Mali	Africa	Thailand	Asia
Mauritania	Africa	Turkey	Asia
Mauritius	Africa	Turkmenistan	Asia
Namibia	Africa	Uzbekistan	Asia
Niger	Africa	West Bank and Gaza	Asia
Nigeria	Africa	Yemen, Rep.	Asia
Rwanda	Africa	Albania	Europe
Senegal	Africa	Belarus	Europe
Sierra Leone	Africa	Bosnia and Herzegovina	Europe
South Africa	Africa	Bulgaria	Europe
Sudan	Africa	Kosovo	Europe
Tanzania	Africa	Macedonia, FYR	Europe
Togo	Africa	Moldova	Europe
Tunisia	Africa	Montenegro	Europe
Uganda	Africa	Romania	Europe
Zambia	Africa	Serbia	Europe
Zimbabwe	Africa	Ukraine	Europe
Afghanistan	Asia	Belize	North America
Armenia	Asia	Costa Rica	North America
Azerbaijan	Asia	Dominican Republic	North America
		El Salvador	North America

Guatemala	North America	Argentina	South America
Haiti	North America	Bolivia	South America
Honduras	North America	Brazil	South America
Jamaica	North America	Colombia	South America
Mexico	North America	Ecuador	South America
Nicaragua	North America	Peru	South America
Panama	North America	Venezuela, RB	South America

Diagnostics for Objective 2

Diagnostics for Supply Leading Hypothesis Models (Developing Countries)

1. The relationship between financial literacy and inclusive growth (Participation dimension)

a. Testing for Omitted Variables

RESET test of Ramsey using powers of the fitted values of InETPR

Ho: model has no omitted variables

$$F(3, 79) = 1.87 \quad \text{Prob} > F = 0.1413$$

b. Model Specification Test

This checks whether there is a need for more variables in a model. The key indicator of focus is the significance of $_hatsq$. The null hypothesis is that there is no specification error. If the p-value of $_hatsq$ is insignificant then we fail to reject the null and conclude that the model is correctly specified.

Source	SS	df	MS	Number of obs =	87
Model	2257.11176	2	1128.55588	F(2, 84) =	7.63
Residual	12431.1299	84	147.989641	Prob > F =	0.0009
Total	14688.2416	86	170.793507	R-squared =	0.1537
				Adj R-squared =	0.1335
				Root MSE =	12.165

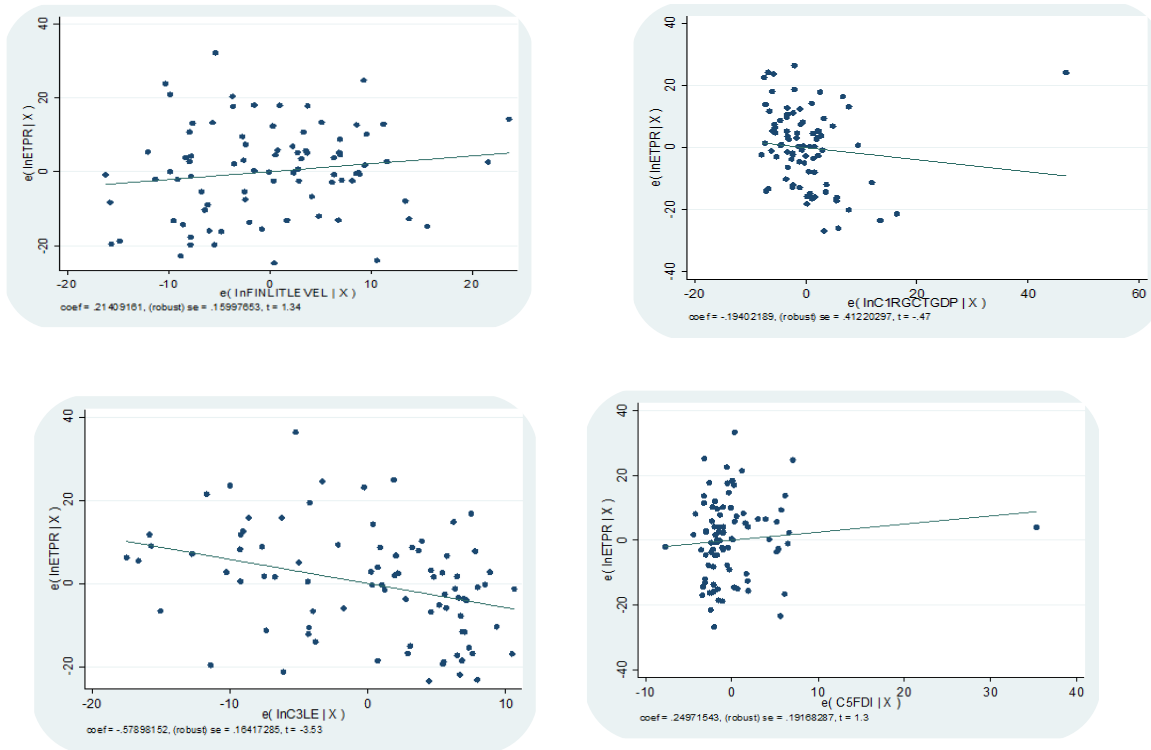
InETPR	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
_hat	9.674457	6.468351	1.50	0.138	-3.188569	22.53748
_hatsq	-.0726579	.0541312	-1.34	0.183	-.1803038	.034988
_cons	-257.0947	192.2015	-1.34	0.185	-639.3085	125.1192

c. Testing for Multicollinearity

Variable	VIF	1/VIF
InFINLITTLE~L	1.08	0.925607
InC1RGCTGDP	1.08	0.929086
C5FDI	1.01	0.991767
InC3LE	1.01	0.994389
Mean VIF	1.04	

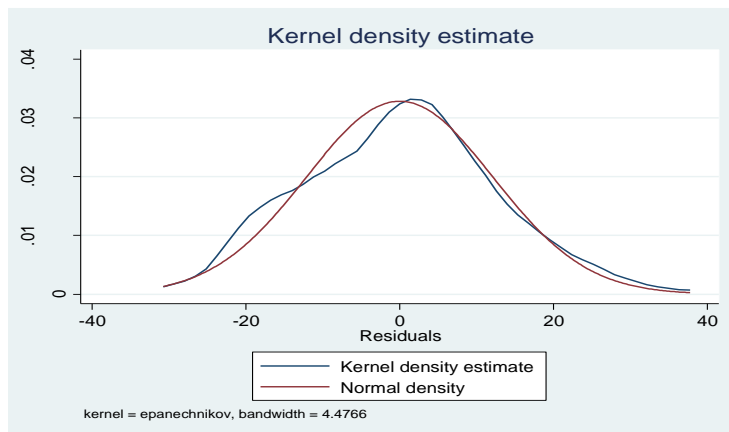
d. Testing for Outliers

Outliers are data points with relative greater values that could exert a negative effect on the estimates.



The plot shows that the data points are in range.

e. Testing for Normality



The graph of the kernel density above seems to show that the residuals do follow a “normal” pattern.

Relationship between Financial Literacy and Inclusive Growth (Benefit Dimension)

Testing for Omitted Variables

Ramsey RESET test using powers of the fitted values of InPOV

Ho: model has no omitted variables

$$F(3, 52) = 0.28 \quad \text{Prob} > F = 0.8412$$

Model Specification Test

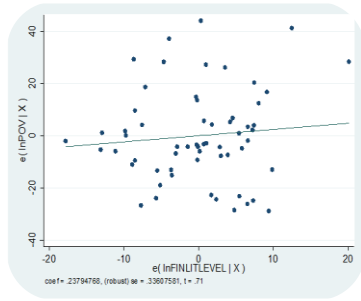
Source	SS	df	MS	Number of obs =	60
-----+-----					
Model	5477.90839	2	2738.95419	F(2, 57) =	8.55
Residual	18263.5286	57	320.412783	Prob > F =	0.0006
-----+-----					
Total	23741.437	59	402.397237	R-squared =	0.2307
-----+-----					
				Adj R-squared =	0.2037
				Root MSE =	17.9

InPOV	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
-----+-----						
_hat	1.902367	2.243427	0.85	0.400	-2.590018	6.394752
_hatsq	-.0111743	.0276177	-0.40	0.687	-.0664778	.0441291
_cons	-17.16857	43.51457	-0.39	0.695	-104.305	69.96785
-----+-----						

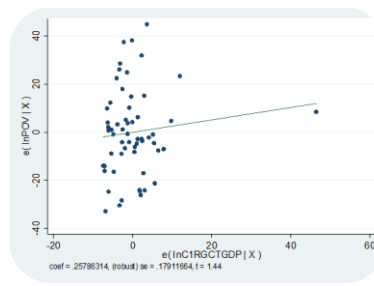
Testing for Multicollinearity

Variable	VIF	1/VIF
-----+-----		
InC1RGCTGDP	1.06	0.940443
InFINLITTLE~L	1.06	0.941196
C5FDI	1.00	0.998807
InC3LE	1.00	0.999197
-----+-----		
Mean VIF	1.03	

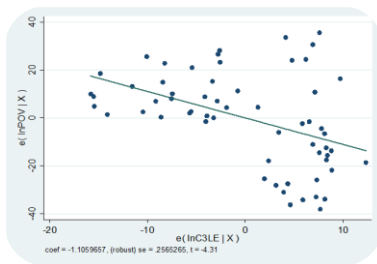
Testing for Outliers



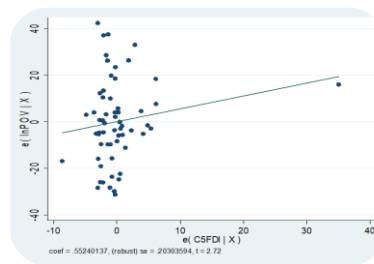
FINANCIAL LITERACY



RATIO OF GOVT. EXP TO GDP

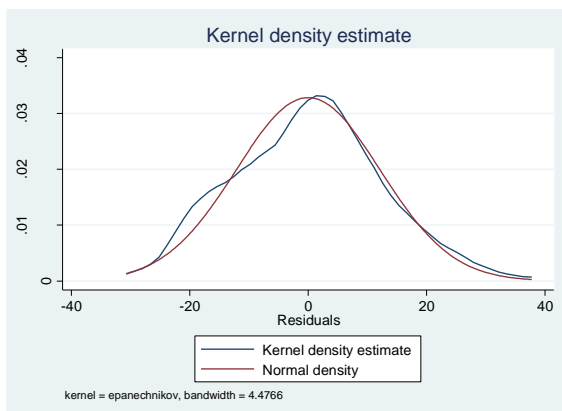


LIFE EXPECTANCY



FDI

Normality Test



Diagnostics for Demand Following Hypothesis Models

Relationship Between Inclusive Growth (Participation Dimension) & Financial Literacy

Testing for Omitted Variables

Ramsey RESET test using powers of the fitted values of InFINLITLEVEL

Ho: model has no omitted variables

$$F(3, 79) = 3.25 \quad \text{Prob} > F = 0.0262$$

Model Specification Test

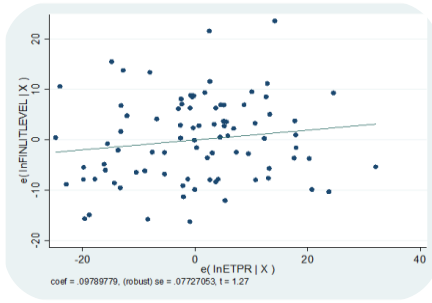
Source	SS	df	MS	Number of obs = 87		
-----+-----				F(2, 84) = 6.26		
Model	830.65064	2	415.32532	Prob > F = 0.0029		
Residual	5576.61373	84	66.3882587	R-squared = 0.1296		
-----+-----				Adj R-squared = 0.1089		
Total	6407.26437	86	74.503074	Root MSE = 8.1479		

InFINLITLE~L	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
-----+-----						
_hat	5.449096	2.414872	2.26	0.027	.6468585	10.25133
_hatsq	-.0636508	.0342195	-1.86	0.066	-.1317	.0043984
_cons	-75.80488	41.9721	-1.81	0.074	-159.271	7.66125

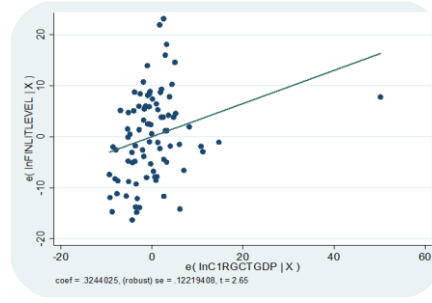
Testing for Multicollinearity

Variable	VIF	1/VIF
-----+-----		
InETPR	1.13	0.882991
InC3LE	1.12	0.890157
C5FDI	1.02	0.984402
InC1RGCTGDP	1.01	0.992656
-----+-----		
Mean VIF	1.07	

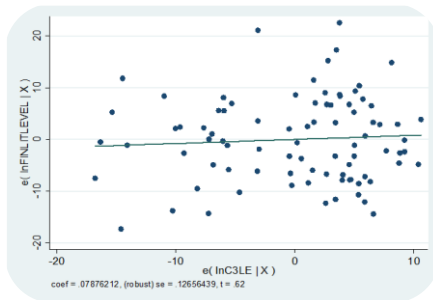
Testing for Outliers



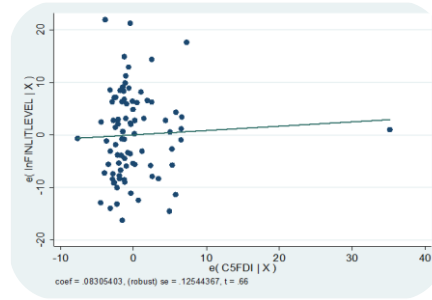
ETPR



RATIO OF GOVT EXP TO GDP

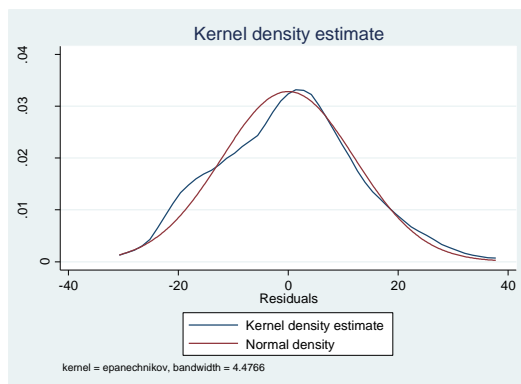


LIFE EXPECTANCY



FDI

Test of Normality



Relationship Between Inclusive Growth (Benefit Dimension) & Financial Literacy

Omitted Variable Test

Ramsey RESET test using powers of the fitted values of InFINLITLEVEL

Ho: model has no omitted variables

$$F(3, 52) = 0.32 \quad \text{Prob} > F = 0.8106$$

Model Specification

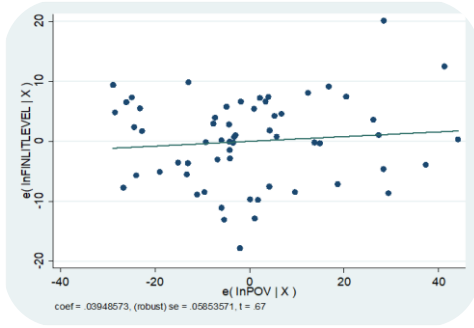
Source	SS	df	MS	Number of obs = 60		
-----+-----				F(2, 57) =	2.32	
Model	245.635686	2	122.817843	Prob > F	= 0.1072	
Residual	3014.29765	57	52.8824149	R-squared	= 0.0753	
-----+-----				Adj R-squared	= 0.0429	
Total	3259.93333	59	55.2531073	Root MSE	= 7.272	

InFINLITL~L	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
-----+-----						
_hat	5.221109	6.145318	0.85	0.399	-7.084679	17.5269
_hatsq	-.0609435	.0884427	-0.69	0.494	-.238047	.11616
_cons	-72.31954	106.0931	-0.68	0.498	-284.7673	140.1282

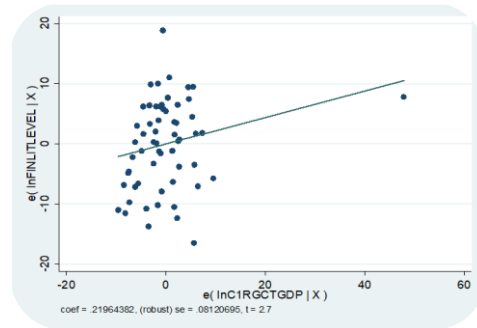
Testing for Multicollinearity

Variable	VIF	1/VIF
-----+-----		
InPOV	1.28	0.778795
InC3LE	1.24	0.807122
C5FDI	1.03	0.973156
InC1RGCTGDP	1.02	0.980465
-----+-----		
Mean VIF	1.14	

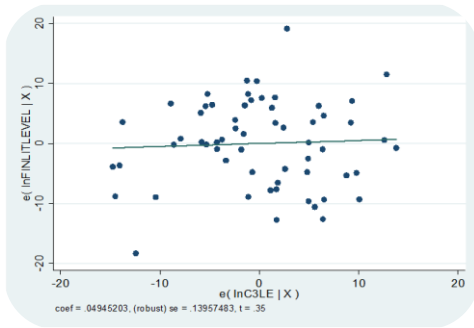
Testing for Outliers



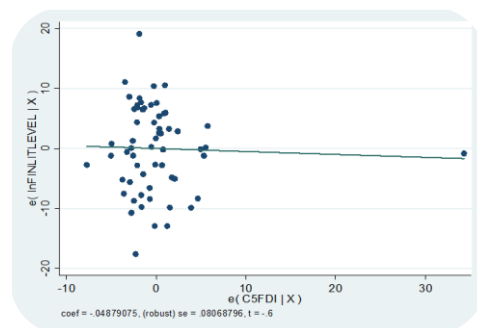
POV



RATIO OF GOVT EXP TO GDP

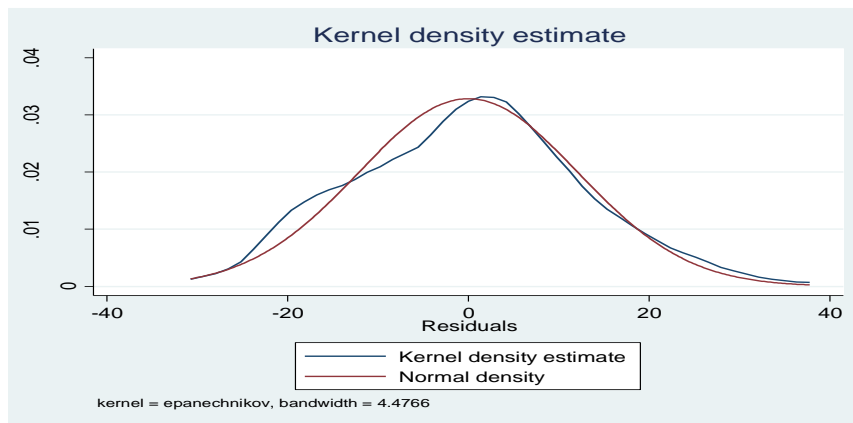


LIFE EXPECTANCY



FDI

Normality Test



Diagnostics for Supply Leading Hypothesis Models (Africa)

1. The relationship between financial literacy and inclusive growth (Participation dimension)

Omitted Variable Test

Ramsey RESET test using powers of the fitted values of InETPR

Ho: model has no omitted variables

$$F(3, 24) = 2.05 \quad \text{Prob} > F = 0.1338$$

Model Specification Test

Source	SS	df	MS	Number of obs = 32		
-----+-----				F(2, 29) =	4.30	
Model	1362.23784	2	681.11892	Prob > F	= 0.0232	
Residual	4593.90686	29	158.410581	R-squared	= 0.2287	
-----+-----				Adj R-squared	= 0.1755	
Total	5956.1447	31	192.1337	Root MSE	= 12.586	

InETPR	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
-----+-----						
_hat	5.8137	5.183576	1.12	0.271	-4.787903	16.4153
_hatsq	-.0395644	.0425018	-0.93	0.360	-.1264903	.0473615
_cons	-144.8026	157.1807	-0.92	0.365	-466.2732	176.668

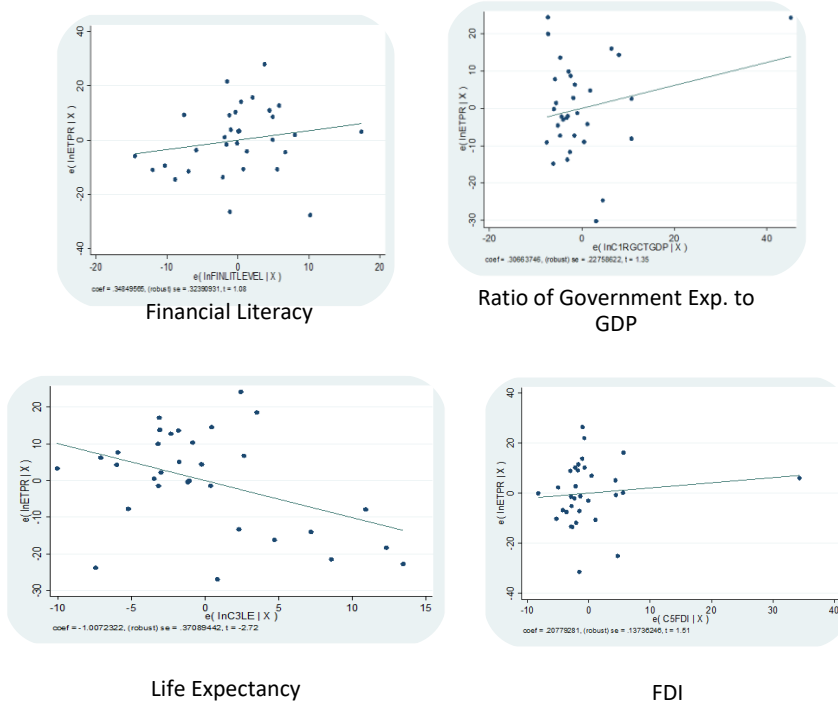
Since the `_hatsq` of the model is 0.360, it suggests that the model is correctly specified.

Test of Multicollinearity

Variable	VIF	1/VIF
-----+-----		
InFINLITTLE~L	1.27	0.788916
InC3LE	1.26	0.794750
InC1RGCTGDP	1.08	0.926336
C5FDI	1.01	0.988143
-----+-----		
Mean VIF	1.15	

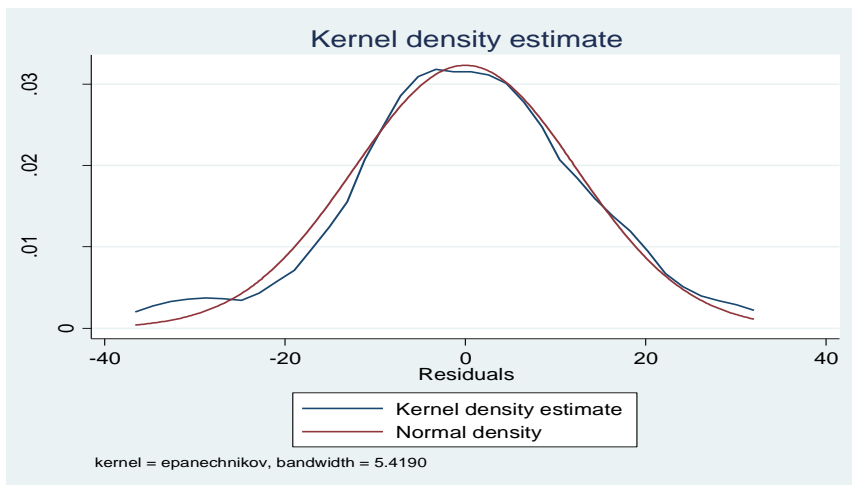
The vif shows that there is no multicollinearity between the variables.

Checking for Outliers



The avplots show that data points seem to be in range and no outliers are observed.

Normality Tests



The graph of the kernel density above seems to show that the residuals do follow a “normal” pattern.

Relationship Between Financial Literacy and Inclusive Growth (Benefit Dimension)

Omitted Variable Test

Ramsey RESET test using powers of the fitted values of InPOV

Ho: model has no omitted variables

$$F(3, 24) = 0.27 \quad \text{Prob} > F = 0.8474$$

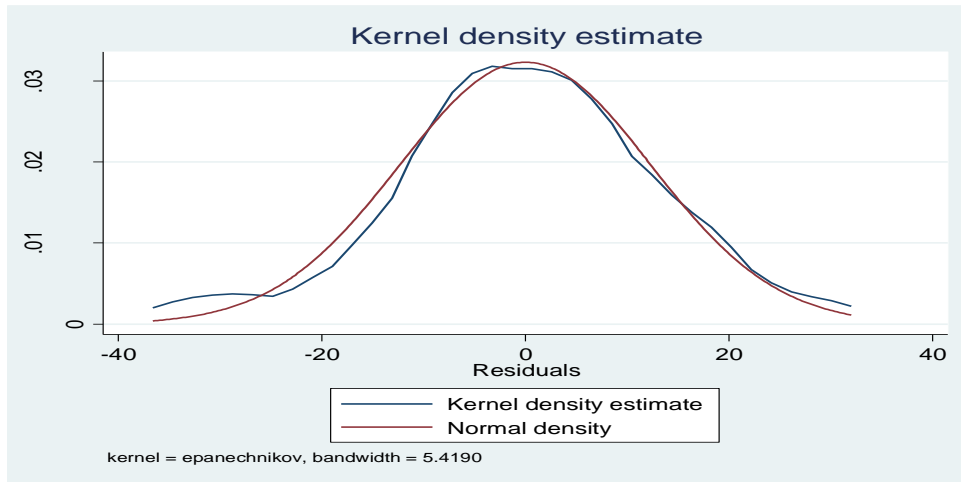
Model Specification Test

Source	SS	df	MS	Number of obs =	32
-----+-----					
Model	1305.63825	2	652.819123	F(2, 29) =	7.77
Residual	2437.21047	29	84.0417402	Prob > F =	0.0020
-----+-----					
Total	3742.84871	31	120.737055	R-squared =	0.3488
-----+-----					
				Adj R-squared =	0.3039
				Root MSE =	9.1674
-----+-----					
InPOV	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]
-----+-----					
_hat	-1.585857	3.482562	-0.46	0.652	-8.708497 5.536783
_hatsq	.0247606	.033255	0.74	0.463	-.0432536 .0927748
_cons	66.53858	90.38875	0.74	0.468	-118.3272 251.4043

Test of Multicollinearity

Variable	VIF	1/VIF
-----+-----		
InFINLITLE~L	1.27	0.788916
InC3LE	1.26	0.794750
InC1RGCTGDP	1.08	0.926336
C5FDI	1.01	0.988143
-----+-----		
Mean VIF	1.15	

Test of Normality



Diagnostics for Demand Following Hypothesis Models (Africa)

Relationship Between Inclusive Growth (Participation Dimension) & Financial Literacy

Omitted Variable Test

Ramsey RESET test using powers of the fitted values of InFINLITLEVEL

Ho: model has no omitted variables

$$F(3, 24) = 0.18 \quad \text{Prob} > F = 0.9068$$

Model Specification Test

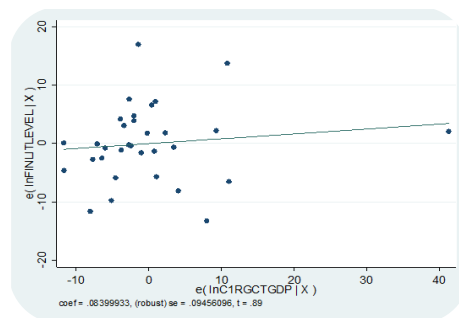
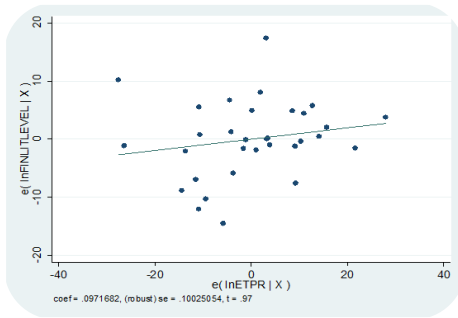
Source	SS	df	MS	Number of obs = 32		
Model	417.886098	2	208.943049	F(2, 29) =	4.62	
Residual	1312.83265	29	45.2700915	Prob > F =	0.0182	
Total	1730.71875	31	55.8296371	R-squared =	0.2415	
				Adj R-squared =	0.1891	
				Root MSE =	6.7283	

InFINLITLE~L	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
_hat	2.816778	4.872517	0.58	0.568	-7.148639	12.7822
_hatsq	-.0271638	.0726831	-0.37	0.711	-.1758174	.1214898
_cons	-30.02497	81.09384	-0.37	0.714	-195.8805	135.8306

Test of Multicollinearity

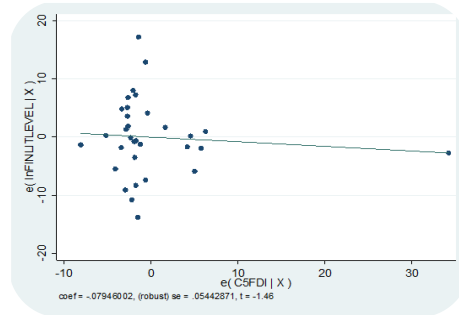
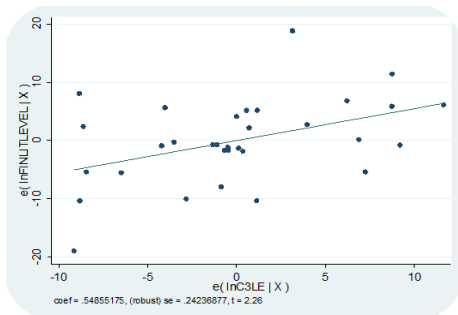
Variable |	VIF	1/VIF
InC3LE |	1.24	0.805915
InETPR |	1.22	0.822177
InC1RGCTGDP |	1.12	0.889072
C5FDI |	1.02	0.981616
Mean VIF |	1.15	

Testing for Outliers



Financial Literacy Level

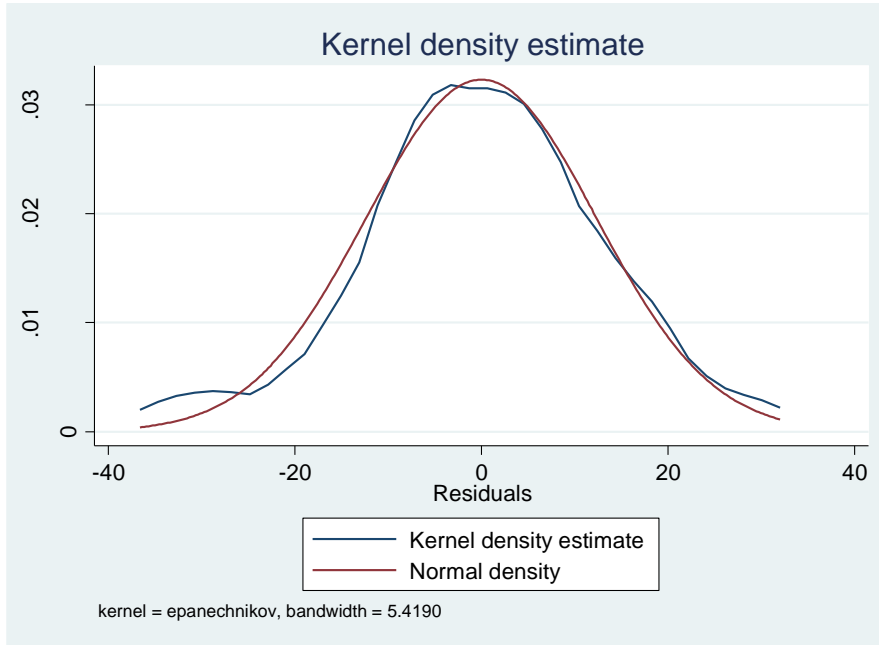
Ratio of government Exp to GDP



Life Expectancy

FDI

Normality Test



Relationship Between Inclusive Growth (Benefit Dimension) & Financial Literacy

Omitted Variable Test

Ramsey RESET test using powers of the fitted values of InFINLITLEVEL

Ho: model has no omitted variables

$$F(3, 24) = 0.48 \quad \text{Prob} > F = 0.7008$$

Model Specification Test

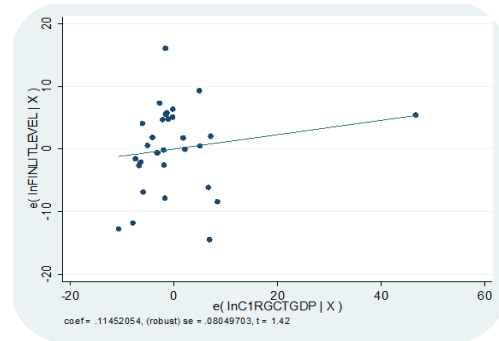
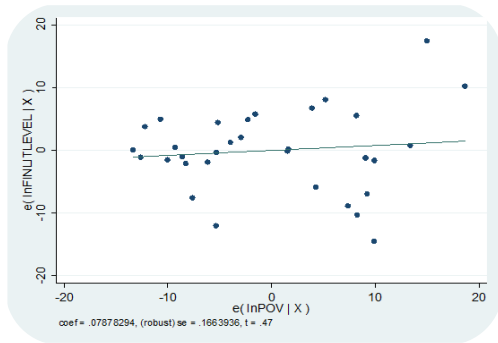
Source	SS	df	MS			
Model	438.409297	2	219.204648	Number of obs =	32	
Residual	1292.30945	29	44.5623949	F(2, 29) =	4.92	
Total	1730.71875	31	55.8296371	Prob > F =	0.0145	
				R-squared =	0.2533	
				Adj R-squared =	0.2018	
				Root MSE =	6.6755	

InFINLITLE~L	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
_hat	7.012394	5.304553	1.32	0.197	-3.836634	17.86142
_hatsq	-.0885462	.077959	-1.14	0.265	-.2479903	.0708979
_cons	-100.9432	89.59947	-1.13	0.269	-284.1947	82.3083

Test of Multicollinearity

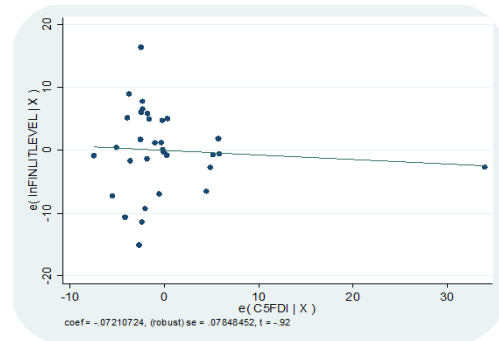
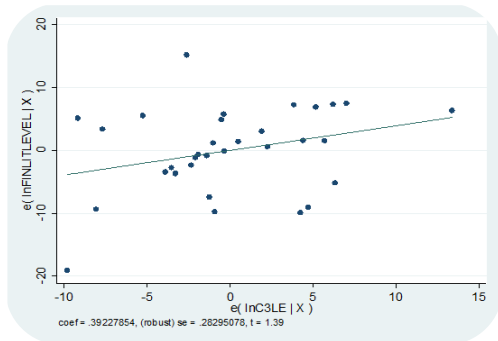
Variable	VIF	1/VIF
InC3LE	1.51	0.664393
InPOV	1.49	0.671279
InC1RGCTGDP	1.05	0.952383
C5FDI	1.02	0.981124
Mean VIF	1.27	

Testing for Outliers



Financial Literacy

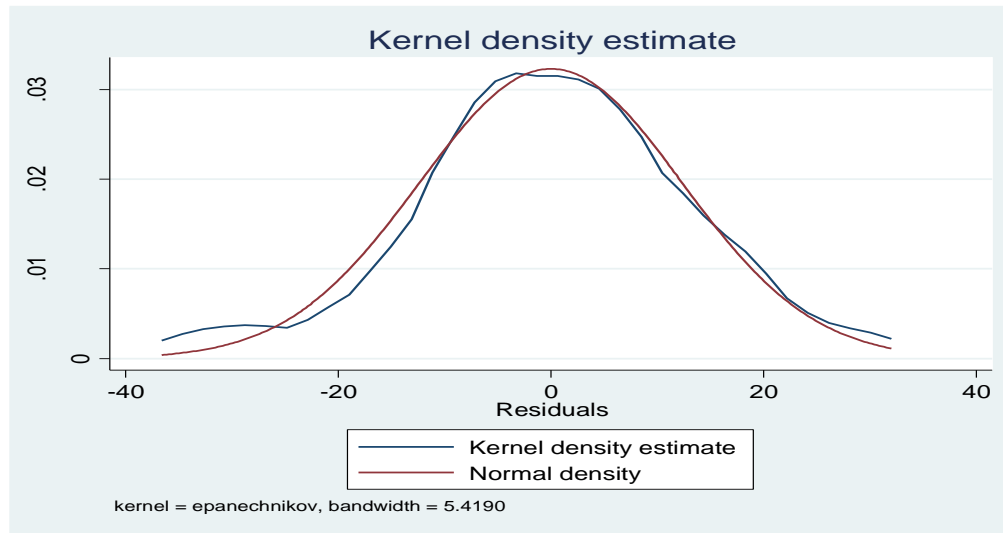
Ratio of government Exp to GDP



Life Expectancy

FDI

Test of Normality



APPENDIX 4: Descriptive Statistics and Diagnostics for Objective 3

Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
AccountOwnership	37	25.09578	18.96378	3.490045	82.20827
Savings	37	12.54153	9.392499	1.981984	35.53308
BankCredit	37	5.792541	4.133447	1.374918	17.06235
FinLit	37	32.83784	7.847553	15	52
BankBranches	37	5.894865	5.07208	.69	24.3
Pensions	37	21.03514	26.77704	.9	100
Insurance	37	1.57	2.419548	.02	13.14
Microfinance	37	7.15073	14.61852	.04	87
Broadmoney	37	13.06885	7.327244	-2.635547	37.29264
InternetUse	37	18.01508	14.33762	1.63	56.8
SchoolEnrolment	37	60.61842	21.50629	15.4567	94.1399
LOGGDPpercapita	37	3.513412	.4018059	2.883367	4.283994
Populationdensity	37	90.17523	132.4221	2.879899	621.1498

Correlation Matrix (obs=37)- For Main Variables

	AccountOwn~p	Savings	BankCredit	FinLit	BankBranches	Pensions	Insurance	MicroFinance	Broadmoney~h
AccountOwn~p	1.0000								
Savings	0.9445	1.0000							
BankCredit	0.7259	0.7573	1.0000						
FinLit	0.2784	0.2275	0.4155	1.0000					
BankBranches	0.6884	0.5779	0.4953	0.3138	1.0000				
Pensions	0.7014	0.6045	0.4188	0.3639	0.4752	1.0000			
Insurance	0.6717	0.5931	0.4657	0.3514	0.5372	0.6871	1.0000		
MicroFinance	0.4265	0.2000	0.0444	0.2007	0.2814	0.4748	0.1477	1.0000	
Broadmoney~h	-0.2202	-0.1740	-0.0623	-0.2832	-0.3732	-0.2673	-0.2677	-0.1396	1.0000

Diagnostics Tests

- a. **Test of Homoscedasticity:** All the models were estimated using robust estimation method to deal with any issues of heteroscedasticity. Following the Stock & Watson (2003), who suggest that as a rule of thumb heteroscedasticity should be assumed in any model hence, it should be estimated with robust technique.

b. Testing for Omitted Variables

i. Account Ownership

Ramsey RESET test using powers of the fitted values of AccountOwnership

Ho: model has no omitted variables

$$F(3, 28) = 0.36 \quad \text{Prob} > F = 0.7828$$

Since the p-value is higher than the threshold of 5% (95% significance), one fails to reject the null hypothesis and conclude that there is no need to add more variables. Thus, there is no omitted variable bias.

ii. Saving

Ramsey RESET test using powers of the fitted values of Savings

Ho: model has no omitted variables

$$F(3, 28) = 0.21 \quad \text{Prob} > F = 0.8856$$

Since the p-value is higher than the threshold of 5% (95% significance), one fails to reject the null hypothesis and conclude that there is no need to add more variables. Thus, there is no omitted variable bias.

iii. Bank Credit

Ramsey RESET test using powers of the fitted values of BankCredit

Ho: model has no omitted variables

$$F(3, 28) = 0.10 \quad \text{Prob} > F = 0.9594$$

Since the p-value is higher than the threshold of 5% (95% significance), one fails to reject the null hypothesis and conclude that there is no need to add more variables. Thus, there is no omitted variable bias.

c. Testing for Multicollinearity

i. Account Ownership

Variable |	VIF	1/VIF
LOGGDPperC~a |	1.77	0.563525
SchoolEnro~t |	1.76	0.568006
InternetUse |	1.30	0.770020
FinLit |	1.19	0.839772
Population~y |	1.17	0.857945
Mean VIF |	1.44	

There is no multicollinearity in the model because the variance inflation factor (VIF) of all the variables in the model is less than 10 or the 1/VIF is greater than 10%.

ii. Savings

Variable |	VIF	1/VIF
LOGGDPperC~a |	1.77	0.563525
SchoolEnro~t |	1.76	0.568006
InternetUse |	1.30	0.770020
FinLit |	1.19	0.839772
Population~y |	1.17	0.857945
Mean VIF |	1.44	

Multicollinearity does not exist in the model because the variance inflation factor (VIF) of all the variables in the model is less than 10 or the 1/VIF is greater than 10%.

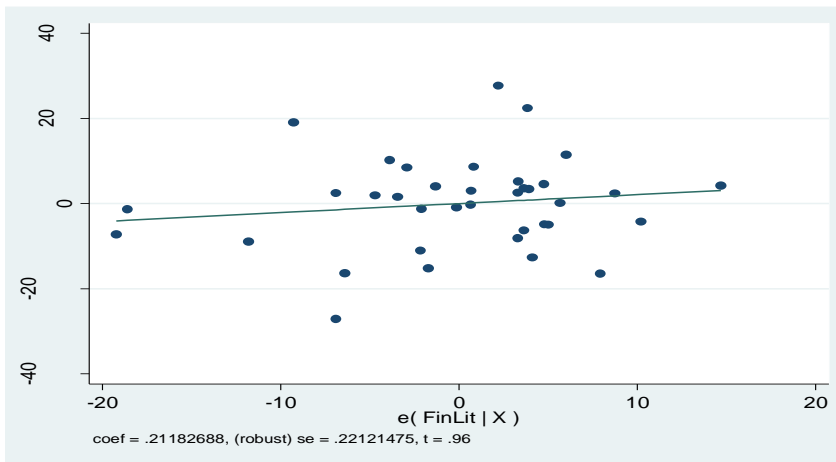
iii. Bank Credit

Variable |	VIF	1/VIF
LOGGDPperC~a |	1.77	0.563525
SchoolEnro~t |	1.76	0.568006
InternetUse |	1.30	0.770020
FinLit |	1.19	0.839772
Population~y |	1.17	0.857945
Mean VIF |	1.44	

Multicollinearity is not present in the model because the variance inflation factor (VIF) of all the variables in the model is less than 10 or the 1/VIF is greater than 10%.

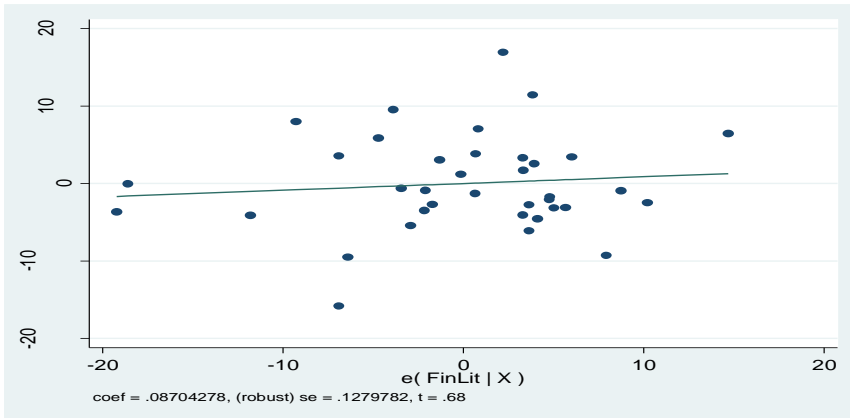
d. Testing for Outliers

i. Account ownership

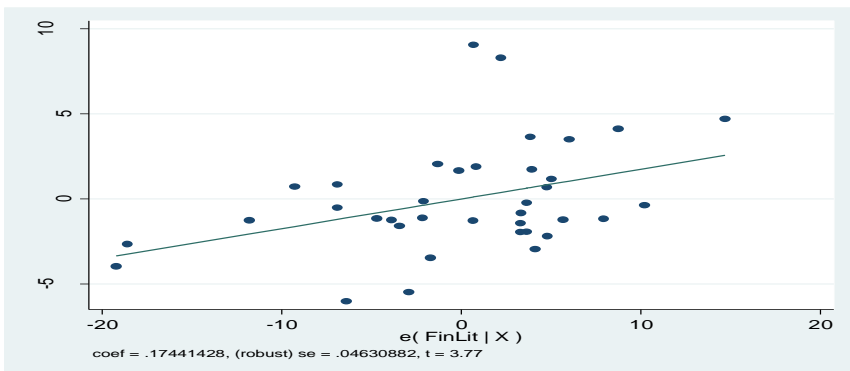


The graph for the data of financial literacy (the main independent variable) shows that there are no data points with larger values that could have a negative effect on the estimates. Hence, there are no outliers in the data.

ii. Savings

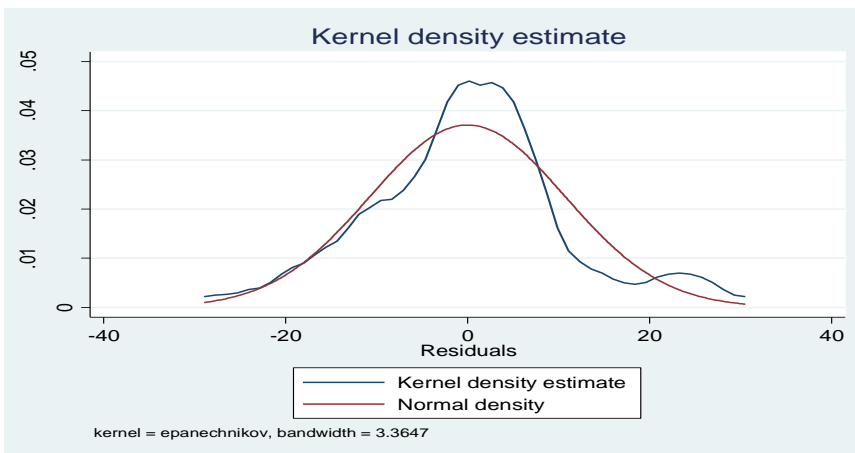


iii. Bank Credit



e. Testing for Normality

i. Account Ownership



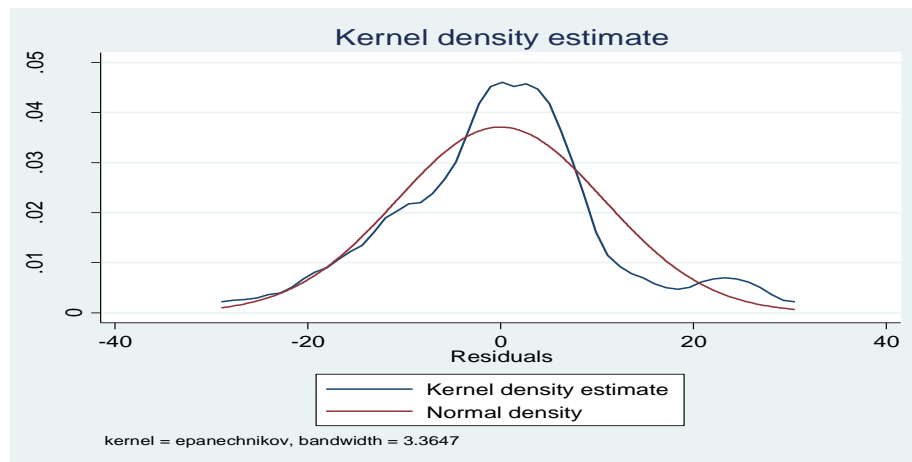
The graph of the kernel density above indicates that the residuals do follow a “normal” pattern.

In addition, the Smirnov-Kolmogorov test shows a probability of 0.3765 which is greater than 0.05. Hence, one must fail to reject the null hypothesis and infer that the residuals are normally distributed.

Skewness/Kurtosis tests for Normality

Variable	Obs	Pr(Skewness)	Pr(Kurtosis)	adj chi2(2)	joint Prob>chi2
resid	37	0.5780	0.2180	1.95	0.3765

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