THE IMPACT OF FINANCIAL INCLUSION ON ECONOMIC GROWTH: THE CASE OF SELECTED AFRICAN COUNTRIES

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DECLARATION

I, the undersigned, Nontobeko Nomfundo Andre, hereby declare that this research is my own, unaided work. It is being submitted in partial fulfillment of the requirements for the degree of Masters in Economic Sciences at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in this or any other university.

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There is a Zulu phrase "**Umuntu ngumuntu ngabantu**", I am who I am today because of you. Thank you all

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ABSTRACT

This study uses a panel data estimation approach to estimate the relationship between financial inclusion and economic growth using the case of 34 countries in Sub-Saharan Africa. The study uses panel data sourced from the World Bank which include the Global Financial Index survey and World Development Indicators covering the periods of 2011, 2014 and 2017. The study analysis is based on two models, the first model measures the relationship between financial inclusion and economic growth and the second model measures the relation between financial inclusion and financial development. The results of the first model established a relationship between financial inclusion (measured by account ownership and a composite financial index) and economic growth (measured by Logarithm of GDP). This confirms what is in the literature, that financial inclusion stimulates economic growth. The results from the second model established that financial development (measured by the ratio of credit to GDP) is significantly related to financial inclusion (measured by account ownership and the composite index of financial inclusion). Overall, the results indicate that the use of composite variable and General Least Squares estimation approaches improves the robustness of the regression models. Based on these findings, the study, therefore, recommends among other things that the government promote financial inclusion through reforms in education, trade and industrialisation.

Keywords: Financial inclusion, Economic growth, Financial development, Sub-Saharan Africa

1. INTRODUCTION

1.1 Background

Financial inclusion is a critical component of the global human development in the 21st century. It bears different definitions to different role players from researchers to policymakers. Financial inclusion is often misunderstood as it is often referred to as the access of affordable financial products by households and firms. Financial inclusion is an environment created by policymakers of a specific country which promote development and consumption of financial products by the less privileged sections of that country (Sarma, 2012). Khan suggested that financial inclusion refers to access by all, to formal financial products tailor-made to serve economically disadvantaged individuals of the country (as cited in Siddik and Kabiraj, 2018).

Financial inclusion refers to access to financial products by ordinary citizens these include use and access to a bank account and financial services such as credit, savings and investments. Financial inclusion is a topical subject which is used to measure human economic development. Financial inclusion is important for households, firms and the nation, it allows these entities to participate in economic transaction through the access to financial services. Households need financial products for several purposes which ranges from saving surplus income, making and receiving payments, and smoothing out consumption. Firms require financial products to enable them to operationalise their business which includes making and receiving payments and procurement of capital goods. At economic level financial inclusion allows the government to collect tax, make payments and develop plans for driving economic activities.

Access to a formal bank account is the dominant variable used for measuring financial inclusion, however, there are many variables which are used, including access to credit, savings and availability of banking infrastructures such as banking halls, electronic pay points and ATMs. Recently access to mobile money has become one of the variables which are used to measure financial inclusion. Lack of access to these is seen as an impediment to a decent livelihood, hence governments across the world are driving the financial inclusion agenda as an anti-poverty strategy.

In developing countries, exclusion from formal finance systems presents a hardship for families and limits the productivity of firms. In the absence of formal financial system, household and firms resort to informal system which includes hoarding of cash (staffing cash under the mattress), borrowing at exorbitant rates from informal money lenders and investment in illicit investment practice.

All these informal finance products are usually inferior to those offered by the formal financial systems. Instead of hoarding, formal financial system provides a saving account where their money can be kept safe in interest-bearing accounts. Households and firms are likely to get cheap and affordable credit from formal finance systems as opposed to loan sharks who charge exorbitant interests. Formal financial institutions such as stock exchange allow households and firms to invest their surplus which means that they can grow their surplus and allows them to own businesses through equity of listed companies. Overall, financial inclusion allows the government to undertake its fiscal role and enables it to provide basic services for households, the infrastructure of industry and other national priority services such as national security among other common goods.

Defining financial inclusion is usually informed by two schools of thought; market-based and livelihood approach. The market-based approach argues that financial inclusion drives economic growth whereas the livelihood approach suggests that financial inclusion results in poverty reduction (Beck *et al*., 2009). These approaches are responsible for shaping theoretical and empirical studies on financial inclusion across the globe. According to Sumua *et al*., (2018), the efforts to increase access to financial services is being prioritized by policymakers. Governments throughout the world, especially in Africa are promoting financial inclusion to drive economic growth.

The empirical and theoretical work on financial inclusion is linked to the finance-growth debate which has a long history of scholarly (Schumpeter 1911, Gerschenkron 1962, Patrick 1966, Goldsmith 1966). This topic on the financial inclusion and economic growth nexus has been at the Center of theoretical and empirical studies since the dawn of the 21st century and has generated a lot of literature.

Demirgüç-Kunt and Levine (2009) argued that the way in which financial systems operate has a direct bearing on the distribution of economic opportunities across citizens and firms. Ashraf *et al*., (2006) established that an increase in the percentage of the population that is financially included will translate into high investments into productivity which lead to increase economic growth. It therefore means that financial inclusion allows engagement of economic agents in productive activities, promotes economic growth and financial development. It is hypothesised that financial inclusion increases the accumulation of working capital, which increases economic participation by marginalised households, firms and society (AfDB, 2013, p.25).

The research on establishing the relationship between financial inclusion and economic growth has been undertaken at three levels; at household, firm and the economy levels (Luigi, 2014). At household level financial inclusion drives economic participation as they consume more economic goods (food, shelter, education). Financially included households tend to manage risks or shocks well than those excluded and they are able to deal with a personal economic crisis such as illness or accident. At the firm level, financial inclusion reduces transaction costs thereby improving their productivity and viability. Financially included firms may easily take advantage of investment opportunities as they arise. The empirical results of the study on the impact of financial inclusion on economic growth are coherent at both the micro and macro levels; however, macro-level studies have produced mixed findings on impact and causality (Cull, Demirgüç-kunt and Morduch, 2014).

A number of micro-level studies (Banerjee, Duflo, Glennerster, and Kinnan 2010 and 2013; Crépon, Devoto, Duflo, and Parienté 2011; Karlan and Zinman 2011; Angelucci, Karlan, and Zinman 2013 in Cull *et al*., 2014) showed that access to microcredit improves household welfare. Other studies (Attanasio *et al*., 2011, Angelucci, Karlan, and Zinman 2013 discussed by Cull *et al*., 2014) for Mongolia and Mexico respectively did not find the impact of financial inclusion (proxied by access to microcredit) on economic growth (proxied by household consumption and expenditure) to be true.

At macro level the same dichotomy exists, on the one hand financial inclusion drives economic growth (Levine 2005, Pasali 2013, Demetriades and Law 2006). On the other hand, researchers

have pointed to a negative relationship, especially in the short-run (Loayza and Ranciere 2006). Despite these studies reaching different conclusions on the direction and significance of their causal relation the bulk of the empirical evidence points to a positive relation between the two (Demirguc-Kunt *et al*., 2015, Kpodar and Andrianaivo 2011, Oruo 2013, Onaolapo 2015, Babajide *et al*., 2015). Some authors have found a way to explain the negative and positive trends by proposing that there is a non-linear relation between financial inclusion and economic growth (U shaped), driven by levels of inequality across rich and poor countries (Cecchetti and Kharroubi 2012). As a result, many scholars and researchers took an interest perusing macro-level studies to improve understanding of the relationship between financial inclusion and economic growth.

Given the different conclusion reached by these studies there is still demand for more empirical research effort to establish the relationship between economic growth and financial inclusion. . It is therefore imperative to undertake more empirical studies to improve understanding especially among policy makers, on how they can design and implement financial inclusion to drive economic growth and financial development.

1.2 Problem Statement

Efforts to increase access to finance to drive the economy have not yielded the desired results, especially in Africa. Financial role players have an elitist approach, as they have been designed to serve the corporate sector. The financial industry in Africa lags behind those in other third world sub-regions in Latin America and Asia. Based on the 2017 Global Findex Survey only 43% of the adult population in Africa has a bank account however, only 7% have accessed credit from formal financial institutions.

The population of adults with accounts with formal financial institutions is highest in Mauritius (80%) and South Africa (54%), whereas there are 14 African countries that have less than 10% of their adult population with accounts with formal financial institutions. The worst cases include DRC Congo, Central African Republic, Guinea and Congo, with less than 5% of adults who have access to formal financial services (Demirgüç-Kunt and Klapper, 2012). Many countries in Africa have leap forged the west with respect to increasing financial inclusion through access to digital

products (Aker, 2010). Despite an improvement in account ownership, fewer people have access to other financial products such as credit, insurance and investment products.

Research has shown that access to finance is a major limitation to the development of African economies, especially in those regions where banks rather than stock exchange provide the bulk capital (Mathenge and Nikolaidou, 2015). The non-banking segments such as the stock markets and insurance are less developed in comparison to the banking sector and only a few are sufficiently liquid. Few countries in Africa have functional stock markets and strong insurance industry (Mathenge and Nikolaidou, 2015). Consequently, there is a range of informal financial inclusion mechanisms which play an important role among the poor especially in the rural areas. These include saving and lending clubs, burial societies, remittances, rotating schemes and loan sharks. Conventionally these alternative financial inclusion mechanisms do not get equal attention from researchers and policymakers.

The informal financial products play an important role in driving financial inclusion among low-income earners. According to Finmark Trust 2016 report, saving groups known as stokvels account for 400 million rands per year. It is therefore imperative that policymakers throughout the continent consider saving and lending clubs as levers for driving rural financial inclusion.

Many African countries have a huge financial inclusion gap, this has been largely driven by a lack of appropriate financial products among major banks. There is currently a move amongst major banks to capture the previously unbanked as the gap left by banks is being taken by micro-finance institutions which have accessible but expensive finance.

Ironically, the financial system in Africa is still highly consolidated, controlled by monopolistic firms which crowd out alternative financial systems (MFI, saving groups and mobile banking). The few firms who have monopolistic control, dominate the financial industry in many African countries. Until the advent of mobile banking, banks were the *de facto* benchmark of financial inclusion. They provide platform for access and usage of financial products (account, access to savings, credit, payment methods, insurance and investment products). Mobile money has brought structural shifts around financial inclusion. The growing population in Africa can now access and

consume financial products outside the traditional banks (e.g MPESA and Eco cash in Kenya and Zimbabwe respectively). These platforms have developed a mobile money product which caters for formerly excluded individuals however, the industry has not reached maturity in terms of penetration and product development, and hence access to formal institutions is still the benchmark for financial inclusion. The research and policy debates on financial inclusion are still premised on having a bank account. This is despite the adverse selection shortcomings with regards to the role of formal financial institutions in driving financial inclusion such as fees, discriminatory credit policies, reckless lending, over-indebtedness, among many other malpractices perpetuated by banks.

1.3 Aim of the study

This research study seeks to investigate the relationship between financial inclusion of economic growth. The primary focus of this research study is to establish whether financial inclusion drives economic growth or the reverse as well as the impact of financial development on financial inclusion. The research seeks to establish whether financial inclusion efforts are bearing fruits in growing African economies, with a focus on understanding the mechanism and channels with regards relationship between financial inclusion and economic growth. The study results will be used to draw lessons and recommendations for financial inclusion policies and programs for the continent.

1.3.1. Research Objectives

The main research objectives of the research study are to:

- Investigate the impact of financial inclusion on economic growth in Africa.
- Investigate the impact of financial development on financial inclusion in Africa.

1.3.2. Research Questions

The research questions for this study are aligned to the research objectives, namely

- Does financial inclusion stimulate economic growth in Africa?
- Does financial development stimulate financial inclusion in Africa?

1.4 Study Approach

The study uses a multi-country macro-level analysis to investigate the relationship between financial inclusion and economic growth. A panel data estimation approach is used to analyse the relationship (direction and significance of their relationship) between financial inclusion and economic growth as well as the relationship with socioeconomic factors such as the structure of the financial sector and demographic variables (age, employment, urbanisation and infrastructure development). The study uses panel data from Global Findex Survey, World Bank Development Indicators for 34 African countries covering the period 2011, 2014 and 2017.

Panel data allow the undertaking of the spatial (between countries) and temporal (across time) analysis with respect to drivers of economic growth and financial inclusion. Economic growth is estimated using GDP whereas financial inclusion is measured as a composite index and proxy (account ownership, bank access, mobile money). The study addresses two empirical issues. Firstly, if financial inclusion drives economic growth among African economies and secondly how the development of the financial sector impacts on financial inclusion. The output of the research will contribute to the literature on the financial inclusion and economic growth nexus as well as public policy debates.

1.5 Significance of the Study

This study seeks to establish the relationship between financial inclusion and economic growth for selected African countries. Research has shown that financial inclusion has a dual effect on the economy; it increases economic activity and improves livelihoods. There are two schools of research bodies. The first one looks at the impact of financial inclusion on economic growth and the second focuses on the impact on socio-economic conditions of poor people. Most studies on financial inclusion focus on one of these two schools. This study adopts approaches and methodologies from both approaches.

The study estimates the relation between financial inclusion and (i) economic growth and (ii) financial development. The aim of this study is to establish the relation between financial inclusion and economic growth as well as financial development. Financial inclusion is achieved when the economically excluded sections of society are integrated into the formal financial systems. It means lives are improved and the financially included are able to contribute to economic growth.

At household level, the impact of financial inclusion improves welfare by providing products which allow improvement of cash flow management (formal account), consumption smoothing for basics (access to savings and credit) as well as ability to mitigate and manage shocks such as illness and funerals (access to insurance). At firm level financial inclusion results in lowering of transaction costs (access to payment arrangements) and better distribution of capital (access to savings, insurance and investment products). At country level, financial inclusion assists governments to deliver basic services (payment for public services) and social programs (through mobile cash payments) as well as fiscal tax collection system (access to account ownership and payment arrangement.

The importance of this study is that it seeks to contribute to empirical literature and theory with respect to measuring the impact of financial inclusion on the economy. There is mixed empirical results on the impact of financial inclusion on economy, this depends on the level of the study (household, institutional and national), variable choice, analytical framework, quality of data and theoretical framework (Demirguc-Kunt *et al.,* 2015, Cecchetti and Kharroubi 2012, Loayza and Ranciere 2006). The literature review in this study will explore extensively the different scholars who have written on this topic highlighting their different approaches. With respect to the theoretical framework, the study will use multiple frameworks to understand how financial inclusion drives economic growth. Multi-country (panel data) analysis will be used to evaluate the impact of financial inclusion on economic growth and financial development on financial inclusion.

1.5 Study Organisation

This study is structured as follows; the first section is the introduction, which highlights the aim of the study, problem statement, research objectives, questions and hypotheses. It is followed by section 2 which is the literature review. This section presents a literature review on the issues of financial inclusion and economic impact, it also contains empirical evidence on the economic impact of financial inclusion. Section 3 presents the research methodology for the study with respect to study design, data collection framework, analytical framework, design of estimation models. Section 4 presents the results of the study based on the econometric estimations on the

impact of financial inclusion on economic growth and on the impact of financial development on financial inclusion. Section 5 presents a summary of the study results, study limitations, conclusion, recommendations and areas for future studies.

2. LITERATURE REVIEW

2.1 Introduction

This section is a literature survey on financial inclusion and economic growth based on empirical and theoretical studies drawn from books, working papers, journal articles and academic publications. The sections are presented in three sub-sections, the first sub-section defines financial inclusion and the development perspective around it. The second subsection presents a review of theories which have been applied to understand the drivers of financial inclusion. The third subsection presents a survey of theoretical and empirical studies on the relation between financial inclusion and economic growth as well as financial development impact on financial inclusion.

2.2. Definitions

Researchers have done extensive work on developing definitions for financial inclusion and economic growth and their relationship. Most of the definitions have been drawn from various academic disciplines economics, economic history, development studies, banking and development finance geography. Most of the research work comes from scholars and researchers in the fields of economics, and development finance.

2.2.1. Economic growth

The definition of economic growth is an increase of the total output of goods and services produced by a country. It is usually measured by the gross domestic product which is the value of goods and services produced and compared from one period of time to another. Economic growth occurs whenever people take resources and rearrange them in ways that are more valuable. GDP increases from one period to another emanating from increase production and consumption of goods and services. Economic growth is measured in nominal terms which include inflation or in real terms where inflation is adjusted (Ayres *et al.*, 2006).

Economic growth can be either positive or negative, when it is negative it is translated as shrinking, which is conventionally referred to in economic terms as economic recession or depression. Economic growth measures are used to compare the performances of an economy over time as well as compare countries. When economic growth measures are used for comparative analysis they are quoted in a single currency the American dollar, either using prevailing exchange rate or the purchasing power parity. As countries have different population sizes GDP per capita is used instead and to adjust for inflation or deflation (Ayres and Benjamin, 2006).

2.2.2. Financial Development

Financial development is defined as a combination of financial instruments, financial markets, and the financial institutions in a country. Stock markets and banks are the main sources of finance in an economy and globally there are two financial systems, bank-based system and stock market-based system. A financial system with more reliance on the banking system is characterised as bank-based and the dominant source of financing, whereas the one that relies more on the stock market is characterised as market-based. Germany and Japan are typical banks based financial systems whereas the United States of America (US) and the United Kingdom (UK) have market-based financial systems (Luintel *et al.,* 2008).

2.2.3. Financial inclusion

The term financial inclusion has different definitions in literature but all of them have a similar description and largely refers to the same thing (Masui *et al.*, 2018). The World Bank (2014) defined financial inclusion as the proportion of individuals and firms that use financial products and services. It can also be defined as a process where financial products are made available to all members of society at the fair price, at the right place without any form of discrimination to all members of society by the service provider (Aduda and Kalunda, 2016).

The Global Partnership for Financial Inclusion (GPFI) and the Consultative Group to Assist the Poor (CGAP) defined financial inclusion as a state where everyone has access to financial services such as finance, savings payment and insurance that is provided by formal institutions (Cull *et al.,* 2014). Financial inclusion means the availability, accessibility and use of formal financial services for all (Kumar and Mohanty, 2011). It can also be viewed as supply and access to payment platform

facilities to transmit remittances including access to affordable financial services, savings, loans and insurance services by the formal financial system (Nagadevara, 2009 as cited in Unnikrishnan and Jagannathan, 2014, p. 20). Financial inclusion is measured by several variables, access, affordability, appropriateness, usage, quality, financial education, innovation, and simplicity and consumer protection (Mini *et al.*, 2018).

Table 1: Key indicators for financial inclusion

Access	Refers to the availability of cheap and relevant financial products and through appropriate delivery channels.
Affordability	Refers to the low cost of acquiring financial products and services. There is need to reduce cost-to-client and the cost-to-serve to ensure that the target market (poor) are in a position to pay for the products and services.
Appropriateness	Refers to the ability of financial products and services to meet the needs of customers with respect to protection, dignity including tackling regulatory and language barriers.
Usage	Refers to the act of employing or utilizing a financial service or product. It means financial inclusion can only realise when targeted persons are using the products and services, it means to access and appropriateness alone are not enough to drive financial inclusion.
Quality	Refers to product design and delivery traits that enhance the value of services to clients. The traits of the financial services and products provided by financial institutions. There are several traits which a product has to be in order to attain expected levels of quality. These traits include affordability, simplicity, convenience, product-fit, safety, dignity of treatment and client protection.
Consumer Financial Education	Refers to the provision of financial literacy education to consumers so that they can use financial products and services in a productive and responsible manner which does not adversely cause harm and increase their vulnerability to financial risk and shock.
Innovation and Diversification	Refers to innovation around product and service in terms of product design, delivery channels and new technologies.

Simplicity	Refers to the level of ease of understanding financial products and services. That they are delivered in an understandable language through appropriate accessible channels

Source: Adapted from Finmark, GDPI, CGAP

According to the African Development Bank(AfDB) access to financial services allows enable populations to have a better living and access to essential financial products and services which enable their wellbeing with respect to education, health and business among other basic living conditions (Gourène *et al.,* 2017). GFPI and CGAP indicate that financial products and services should be convenient and must be delivered in a responsible and affordable manner for both consumers and providers. According to the International Network on Financial Education (INFE), financial inclusion refers to fostering the delivery of well-timed financial products and services. The Maya Declaration is a global commitment towards financial inclusion, introduced in 2011 and adopted by 61 countries. This is a pledge to recognize the importance of financial inclusion and to develop relevant policies to assert this commitment to expand access to financial services to the poor.

2.3. Theoretical Review

There are many theories which have been put forward to understand the relationship between financial inclusion and economic growth. There are several theories which were put forward to examine the relationship between financial inclusion and economic inclusion. There are many theorists ranging from Smith (1776), Bagehot (1873), Schumpeter (1911), Gerschenkron (1962), Patrick (1966), and Goldsmith (1966). Levin and King (2002) postulated that there is a significant role of the financial sectors in economic growth in both theoretical and empirical studies. Development of theories on the relationship between finance and real activity can be traced to Smith (1776) who pointed out that real growth in an economy is driven by the activities of the financial system because increased production and specialization is facilitated by enhanced resource (credit) acquisition offered by the financial system. Bagehot (1873) postulated the industrial revolution in Europe was propelled by the financial system which mobilized funds for the industry. According to Schumpeter, finance reduces the cost of external resources to financially dependent firms which create opportunities for new firms, therefore enhance innovation, and hence increase growth indirectly (Schumpeter, 1912). Robinson (1952) argued that economic

development drives financial development this was a departure from early theorist Smith and Schumpeter.

McKinnon (1973) argued that an improvement in financial development would promote the development of physical capital and increase saving ratio and therefore, increase economic growth. Levine study in 1993 showed that most financial indicators are positively correlated with economic development. Lucas (1998) study showed the opposite results on the relationship between financial growth and economic development. His argument is that the growth of financial systems is overstressed in the process of economic development. King and Levine studies in 2001 and 2004 established a positive correlation between economic growth and indicators of financial inclusion. Gerschenkron's theories (1962) argued that the banking system in an economy relied on its economic development in the initial stages of industrialization.

Growth theories - these theories focus on establishing causality between financial inclusion and economic growth in terms of significance and direction of the relationship. There are two sets of growth theories, exogenous growth theory and endogenous growth theory.

Exogenous growth theory - focuses on the importance of the external sector with respect to financial inflows affecting economic growth, wealth inequality and poverty (Dabla Norris, *et al*., 2014, IMF 2015. Beck, *et al.*, 2007). The exogenous growth approach points to economic growth, in the long run, relies on exogenously determined variables, such as technical progress.

Endogenous growth theory - states that direct savings lead to productive investments and this leads to enhanced growth. The theory is based on the notion of economic growth attributed to three factors: growth in labour, growth in capital, and growth in technical progress. In this regard, the theory suggests that human capital, technological factors, savings and investments, cannot influence economic growth.

Kuznets curve theory - is based on describing the link between inequality and financial inclusion. The theory stipulates that at the early stages of economic development, there is a high inequality with respect to financial inclusion. High costs of financial intermediary discriminate against the

poor, as financial intermediaries are in their early development stages. Under these circumstances, only the well-off citizens are able to consume financial products and services. As the economy grows, financial intermediaries will mature and the cost of financial products goes down, which means financial intermediaries will create more products which can be consumed by poor people. The transition of cost of access to financial products and services with respect to economic growth translates into an *inverted U-shape* relationship. This means there is high-income inequality with respect to financial inclusion in the early phases of financial development.

Financial development theories - several theories have been developed to describe the role of financial structure with respect to financial inclusion and financial development. The market based and bank-based theory are the main financial development theories. The market-based theory articulates that market-based financial systems (stock markets, money markets among others) are better placed to drive economic growth and development. Alternatively, the bank based theory states that dominant big banks can hinder or limit financial inclusion through technological innovations and poor governance structure. The market theory puts stock markets ahead of banks as enabling financial inclusion. When stock markets are well developed, they enhance corporate governance by mitigating against principal-agent problems (Arestis *et al*., 2001). Fund managers for unit trust cannot divert funds from the core business unlike the bank managers and therefore work more towards ensuring profitability.

Financial service theory - it stipulates that the source of finance does not matter in driving financial inclusion. The theory states that availability and the efficient provision of financial services are more important drivers of financial inclusion than the source of finance (Arestis *et al*., 2004, Levine 2002). The theory minimizes the role of banks and stock markets in financial inclusion. The theory postulates that if the financial systems are functioning efficiently they reduce transaction costs of accessing or providing finance products. This leads to increased financial inclusion and the costs of financial products such as saving, credit and investments are reduced (Peia and Roszbach, 2014).

2.4. Empirical studies

Several empirical studies were undertaken to assess the relationship between financial inclusion and economic growth. These studies attempt to address two questions, firstly if there is causality (and its direction) between the two variables, and secondly what is the role of financial institutions in promoting financial inclusion in Sub-Saharan African countries. The discussions on the empirical work done to understand the financial inclusion-economic growth nexus are presented in two sections. The first section presents studies on the relationship between financial inclusion on economic growth and the second section presents studies on the role of financial development on financial inclusion.

2.4.1. Financial inclusion and economic growth

There has been an increasing number of studies which produce empirical results that established financial inclusion is a precondition for economic growth (Mohan 2006, Chibba 2009, Manji 2010, Kpodar and Andrianaivo 2011, Unnikrishnan and Jagannathan 2014). Goldsmith (1966) was one of the early academics who produced significant empirical evidence about the relationship between economic growth and financial inclusion. The evidence was based on a cross-country study covering 35 economies between 1860 and 1963. However, his results were not conclusive on the significance of the relationship and the causality.

Following Goldsmith pioneer work, King and Levine (1993a, 1993b, and 1997) showed much stronger evidence, which proved that financial inclusion is significantly associated with capital accumulation and growth of productivity and culminates into economic growth. Their studies support the Kuznets curve theory between inequality and economic growth, a spread between high-income and low-income countries and how this spread can become wider with the increase of financial intermediaries.

King and Levine (1993a), Renelt and Levine (1991) using panel data estimation study showed a positive correlation between financial inclusion and economic growth. Aattouh (2002) study results showed that financial inclusion is positively associated with economic growth only for high-income countries, in low-income countries, there is no causality. Cyn-Young Park *et al*., (2018) study showed that high and middle-income countries have high levels of financial inclusion

and are likely to have low rates of poverty. However, low-income countries tend to have low levels of financial inclusion and high poverty levels.

Studies by Demetriades and Hussein (1996), using data from 16 developing countries showed causality between financial inclusion and economic growth. Khan's study (1999) used vector autoregressive models for 10 developing countries which suggest strong bi-directional relationship for the whole sample. Odedokun (1996) study based on 71 developing countries covering the periods from 1960 to 1980 showed a strong causality between financial inclusion and economic growth. These results are in line with classical theories from Smith and Schumpeter which hypothesized a positive significant relationship between financial inclusion and economic growth strongly.

Grakolet *et al*., (2017) study established that in the short run, between 2 and 4 years, there is no relationship between financial inclusion and economic growth. Despite that, the study established that in the long run there was a bi-directional relationship between financial inclusion and economic growth. Suk Yu *et al*., (2016) showed that financial inclusion has a positive effect on economic growth with a bi-directional causality relation. The study by Sharma in 2016 showed that there is a positive association between economic growth and various dimensions of financial inclusion such as banking penetration, access to banking services and usage of banking products and service.

NurAlam *et al*., (2018) study established that the share of private credit to GDP is positively associated with an increase in financial inclusion measured by access to credit by households and firms. Cecchetti and Kharroubi study in 2012 showed a positive non-linear relationship between financial depth and economic growth. These results suggest that when there are no deep financial systems and products, there will be a negative relationship with financial inclusion. Nikolaidou and Mathenge (2015) paper study covering 14 African countries for 24 years showed that financial development/structure has no effect on financial inclusion and economic growth. Alter *et al.*, (2011) study established that financial inclusion (access to credit) and financial development (access gap) influences economic development in Sub-Saharan Africa.

2.4.2. Financial inclusion and financial development

Financial inclusion depends on financial development which is the level of development of a financial system, countries with well developed financial systems have high financial inclusion. Empirically, financial development is usually measured with access to credit for households and businesses. Countries with developed financial systems usually have strong financial systems, which provide credit to households and business thereby enhancing capital accumulation which results in an increase in investment levels. Studies by Levine (2005) and Pasali (2013) showed financial intermediation is positively correlated with growth and employment. Demetriades and Law (2006) showed that the hypothesis that financial intermediation has growth impact does not hold for developing economies with weak institutional frameworks. This can be explained by poor levels of financial regulation characterized by the inflationary environment (Rousseau and Wachtel 2002).

Empirical results on evaluating the relationship between financial development and financial inclusion show a positive relationship (Evans, 2015). Based on the supply-leading hypothesis, financial development increases economic growth, general economic efficiency, liquidity, savings, capital accumulation and entrepreneurship. In contrast, the demand-following hypothesis postulates a lagged response to economic growth, implying that growth creates demand for financial products. It means that economic growth generates increased demand for financial services, leading to higher financial development and thus financial inclusion.

Gregerio and Guidotti (1995) study established that financial intermediation has a positive relationship with economic growth. This means that the efficiency of investment (rather than scale) is the main channel of transmission from financial development to economic growth. Evans (2015) established that lack of banking infrastructure drives high exclusion rates among African countries. Thus, countries in Africa and Asia have high exclusion rates due to poor banking infrastructure. Many countries in Africa have set up formal targets for achieving universal financial access by 2020 (i.e. Lesotho, Nigeria, and Rwanda). Allen *et al*., (2015) study showed that population density is considerably more important for financial development and inclusion in Africa.

3. RESEARCH METHODOLOGY

3.1. Introduction

This section presents the methodology and the research tools which were used to undertake an analysis of the relationship between financial inclusion and economic growth in selected African countries. The aim of this research is to establish the relationship and impact of financial inclusion on both economic growth as well as financial development. This section presents research methods which will be implemented and includes the following sub-sections; design of the study, analytical framework, and data collection framework.

3.2. Study Design

The study sets to establish two things, firstly whether there is a link between financial inclusion and economic growth and secondly if there is a link between financial development and financial inclusion. The study undertakes a quantitative approach using panel estimation econometric modelling to evaluate whether financial inclusion stimulates economic growth. The study covers 34 countries in Sub-Saharan Africa over three periods 2011, 2014 and 2017 over which data on financial inclusion indices are available (see the list in Annexure 1). The study adopted a descriptive research approach based on empirical inquiry and analysis which means that the researcher has no control of independent variables, as they inherently cannot be manipulated (Mugenda and Mugenda, 2003). Conventionally, descriptive studies are concerned with the what, where and how of a phenomenon. The research design is compatible with this study focusing on assessing the relationship between financial inclusion and economic growth using selected cases of Africa countries.

3.3. Data collection framework

The study uses secondary quantitative multi-country data from international sources mainly the World Bank, World Development Indicators, and Global Findex Surveys. The Financial Inclusion (Global Findex) database uses a number of variables to measures how people across 256 countries save, borrow, make payments, and manage risk. To date, the database covers three years 2011, 2014 and 2017. Global Findex surveys collect information every three years focusing on financial inclusion indicators such as access and use of financial products and services. The World

Development Indicator online database is a time-series dataset which collects information on a range of development indicators from agriculture to economic development. The explanatory variables used in this study were drawn from previous empirical studies on the financial inclusion and economic growth nexus and from other studies that examine the determinants of financial development (Levine 2005, Grakolet *et al.,* 2019, Yilmaz *et al.,* 2018, Patrick *et al.,* 2018, Evans 2015, ADB 2018).

Table 2 shows the dependent and explanatory variables used in the two-panel data estimation models, first to estimate the impact of financial inclusion on economic growth, second to estimate the relationship between financial development and financial inclusion.

Table 2: List of variables used in panel data estimation

Variable	**Description**	**Source**	**Apriori relationship**
Economic growth	The logarithm of GDP at current prices	World Bank, World Development Indicators	+
Account ownership	Ownership of a bank account in the past year (% of people older than 15 year old)	World Bank Global Findex Surveys	+
Financial inclusion index	Composite variable for Financial inclusion	Asian Development	+
ATM per 1000	Distribution of ATM per 1000 people Global Findex Database	Global Findex Database	+
Financial Development	Private credit to GDP ratio	World Development Indicators	+
Government expenditure	Government expenditure as a percentage of GDP	World Development Indicators	+
Exports	Percentage of exports to GDP	World Development Indicators	+
Donor support	Overseas Development Assistance	World Development Indicators	-

Rule of Law	Incidences of Violence and Maladministration	World Governance Indicators	_
Industrialisation	Percentage of Manufacturing and Value addition to GDP	World Development Indicators	+
Foreign Investment	Foreign Direct Investments (in billions)	World Development Indicators	+
Education	School enrolment at the secondary level	World Development Indicators	+

Source: Own compilation

Twelve variables for 34 sub-African countries were used to estimate the relationship between financial inclusion and economic growth as well as the relationship between financial inclusion and financial development. The dependent variable for the two models is the logarithm GDP and financial inclusion (we use account ownership as a proxy). A number of socio-economic factors were also regressed against economic growth these included government expenditures, export levels, donor support, education (school enrolment), Foreign investment and rule of law.

Economic growth is measured by the linearised logarithm of GDP at current American Dollar prices derived from the World Bank Development Indicators database covering 2011, 2014 and 2017. The apriori hypothesis is that economic growth has a positive significant relationship with financial inclusion variables (Account ownership, ATM per 1000, mobile money account and the Financial Inclusion Index).

Financial inclusion is measured by several variables derived from the World Bank Global Findex Surveys and Asian Development Bank. From the Global Finex surveys account ownership and access to ATM per 1000 were used in this study covering 2011, 2014, 2017 periods. The Financial Inclusion Index is a composite variable of weighted Global Findex Survey data which was calculated by the Asian Development Bank covering 2011 and 2014 periods. apriori hypothesis we assume that financial inclusion indicators have a positive significant relationship with economic growth (measured by LNGDP) and financial development (measured by a credit to GDP ratio).

Financial development is measured by the ratio of Credit to Gross Development Product Apriori hypothesis is financial development has a significant positive relationship with financial inclusion.

Government expenditure is measured by Government expenditure as a percentage of GDP covering periods 2011, 2014 and 2017.

Exports are measured by the value of exports as a percentage of GDP covering 2011, 2014 and 2017 periods. Apriori hypothesis is that exports have a significant positive relationship with economic growth.

Donor support is measured by overseas development assistance as a percentage of GDP covering 2011, 2014 and 2017 periods. Apriori hypothesis is that donor support has a significant negative relationship with economic growth. In the analysis, this variable is captured as development assistance.

Rule of law is measured by incidence of violence and mal-administration in a county covering 2011, 2014 and 2017. Apriori hypothesis rule of law has a significant negative relationship with economic growth.

Industrialisation is measured by the value of manufacturing and value addition sectors as a percentage of GDP covering 2011, 2014 and 2017 periods. Apriori hypothesis is that industrialisation level has a positive significant relationship with economic growth.

Foreign Investments is measured by the level of foreign direct investment at current United States Dollar Prices for 2011, 2014 and 2017 periods. Apriori foreign investment has a positive significant relationship with economic growth.

Education level is measured by secondary school enrolment covering 2011, 2014 and 2017 periods, Apriori hypothesis is that education level has a significant positive relationship with economic growth and financial inclusion. In the analysis, this variable is captured as school enrolment.

3.4. Analytical framework

The analytical framework for this study is based on two-panel data econometric models, model one assess the link between financial inclusion and economic growth, and model two assess the impact of financial development (structure) on financial inclusion.

Model 1: Estimating the impact of financial inclusion on economic growth

To estimate the impact of financial inclusion on economic growth we use a panel estimation model covering 34 countries in sub-Saharan Africa.

Model Specification

$$lnGDP_{it} = \alpha_0 + \alpha_1 FinInc_{it} + \sum_{k=2}^{T} \alpha_k X_{it} + c_i + l_t + \varepsilon_{it} \quad \ldots\ldots\ldots\ldots (1)$$

Where

- Log GDP is the dependent variable for economic growth for 34 African countries, covering 2011, 2014 and 2017
- $FinInc_{it}$ is the financial inclusion variables (Account ownership, ATM per 1000, Mobile money account and Index for Financial inclusion (developed by ADB) for each of country (*i*=1,2,…34) for 3 time periods (t=2011, 2014 and 2017)
- X_{it} is a vector of variables that also drive economic growth (exports, government expenditure, rule of law, donor support, foreign investments)
- C_i country fixed effects estimator
- L_t time fixed effects estimator
- e_{it} is a well behaved normally distributed error term.

Test for the hypothesis that financial inclusion has a significant positive impact on economic growth

Model 2: Estimating the impact of financial development on financial inclusion

The model measures the impact of financial development on financial inclusion; we use a panel data estimation model. We regress financial inclusion against financial development variables by number of ATMs per 1000 and financial deepening which is the ratio of credit to GDP for each

country. In addition to financial development variables, control variables such as education level and population density will also be regressed against financial inclusion.

Model specification

$$FinInc_{it} = \alpha_0 + \alpha_1 FinDev_{it} + \sum_{k=2}^{T} \alpha_k X_{it} + c_i + l_t + \varepsilon_{it} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (2)$$

Where

- $FinInc_{it}$ is financial inclusion measured by account ownership, Bank access, Mobile money and Index for Financial inclusion
- $FinDev_{it}$ is for financial development measured by Credit to GDP ratio (proxy) captured by the World Development Indicators and Global Findex surveys for 34 countries for 2011, 2014 and 2017
- X_{it} is a vector of control variables that also drive financial inclusion (government expenditure, exports, rule of law, donor support, foreign investments)
- C_i country fixed effects estimator
- L_t time fixed effects estimator
- e_{it} is an error term.

Test for the hypothesis that financial development has a positive impact on financial inclusion.

STATA (version 12) statistical package was used to undertake panel data estimation. We employ two estimation approaches; OLS fixed effects approach and the contemporise Generalised Least Squares. Fixed effects OLS model also known in STATA as **xtreg** can produce the between-regression estimator and the within-regression (fixed effects) estimator. Generalized least-squares also was known in STATA as **xtgls** estimates for models in which the regression estimator has a variance structure (random effects) (www.stata.com). Two data sets were used; the first data set from the Global Findex covers 2011, 2014 and 2017 period for 34 countries. In this dataset account ownership is the independent variable whereas the second dataset covers 2011 and 2014, Index of Financial Inclusion calculated by the Asian Development Bank (derived from Sarma 2008) is used

as the independent variable. A number of statistical tests were computed and are summarised in the table below.

4. RESULTS AND DISCUSSION

4.1. Introduction

The section presents the study results on the impact of financial inclusion on economic growth in selected Africa countries. The results are presented in three sections; the first section presents results of descriptive analysis of financial inclusion and economic growth across the 34 selected countries. The second section presents the results of a panel data econometric estimation to assess the impact of financial inclusion on economic growth as well as the impact of financial development on financial inclusion. The last section presents the study summary and discussion of findings.

4.2. Descriptive Analysis

This section presents the descriptive analysis of the levels and drivers of financial inclusion in sub-Saharan Africa focussing on those variables which were used in the panel estimation models. The descriptive analysis can be discussed at two levels, firstly the level of financial inclusion for the 34 selected countries and secondly comparison between Sub-Saharan Africa with the rest of the world. The Global Findex surveys and World Development Indicators were used as the main data sources for the descriptive analysis. Global Findex surveys collect information from 256 countries every three years focussing on financial inclusion indicators such as access and use of financial products and services. The World Development Indicator online database is a time-series data set which collects information on a range of development indicators from agriculture to economic development. The study also uses the Index for Financial Inclusion (IFI) from the Asian Development Bank (ADB, 2018) paper as one of the variables.

4.2.1. Study coverage

The data used for this study covers 34 countries out of a total of 54 countries covered in the Global Findex; the major limitation is that the dataset has gaps especially for the year 2017 where there are no data entries for certain countries. The ADB economic growth paper calculations only cover

34 countries and these countries are classified into 3; upper middle income, low middle income and low-income countries.

4.2.2 Financial inclusion

There are several financial inclusion measures which are used in this study, account ownership was selected used as a proxy for financial inclusion. Other variables for financial inclusion will be discussed in the analysis (these include access to credit, ATM access, and mobile money use and payment methods).

4.2.2.1 Account ownership

According to the Global Findex Index survey, statistics for 2017 indicate that 69% of the global population has an account at a formal financial institution; this is an increase of 7% from 2014 and 18% from 2011 levels. Global account ownership levels are lowest in sub-Saharan Africa; at 43% and described as the only region where more than half of the population does not have an account with a financial institution. However, the levels increased from 23% in 2011 to 43% in 2017 showing signs of improvement. Despite the low numbers, financial inclusion for sub-Saharan Africa has experienced the second most rapid increase in bank account ownership behind South Asia. The table below shows the percentage of the population with a bank account for the period 2011, 2014, 2017.

Table 3: Account ownership by region

Country	**2011**	**2014**	**2017**	**Changes between 2011 and 2017**
East Asia & Pacific	60%	72%	74%	**23%**
Europe & Central Asia	69%	78%	81%	**17%**
Latin America & Caribbean	39%	52%	55%	**41%**
North America	89%	94%	94%	**6%**
South Asia	32%	47%	70%	**119%**
Sub-Saharan Africa	23%	34%	43%	**87%**
United States	88%	94%	93%	**6%**

World	51%	62%	69%	**35%**

Source: World Bank Indicators Online database source in 2019

Between 11% to 13% of the population in the 34 selected countries have an account with a formal institution. Mauritius has the highest account ownership in Sub-Saharan Africa whereas Chad has the lowest. There are five countries that have half of their population possessing bank accounts, these include the likes of South Africa, Kenya, Mauritius, Tunisia, Botswana and Algeria. Most of these countries are classified as upper-middle-income economies.

4.2.2.2. Financial inclusion parameters

Table 4 shows a regional comparative analysis of financial inclusion parameters besides account ownership which includes ATM access, internet banking, access to saving, access to credit, mobile payments, credit and debit card ownership. North America has the highest statistics in relation to financial inclusion and Sub-Saharan Africa scores lowest on most of the financial inclusion parameters. The results on sub-Saharan Africa shows that there is wide coverage with respect to banking infrastructure (ATM, internet banking and mobile payment) but there is very limited use of financial products (access to credit and savings, credit and debit cards). Despite high exclusionary trends on most of these parameters, a significant portion of the population in sub-Saharan Africa use mobile platforms for banking.

Table 4: Financial inclusion parameters by region

	ATM access	**Internet Access**	**Saving Access**	**Credit services**	**mobile payments**	**credit card ownership**	**Debit card ownership**
East Asia & Pacific	53%	30%	28%	11%	58%	16%	57%
Europe & Central Asia	68%	41%	32%	15%	78%	34%	71%
Euro area	73%	50%	47%	17%	92%	45%	87%
Latin America & Caribbean	55%	11%	12%	10%	46%	19%	41%
North America	94%	65%	64%	29%	92%	67%	82%
South Asia	72%	3%	16%	7%	28%	3%	27%

Sub-Saharan Africa	54%	6%	14%	7%	34%	3%	18%
World	52%	22%	24%	10%	52%	18%	48%

Source: World Bank Indicators Online database sourced in 2019

On average 47% of the population in the selected 35 countries save, 17% have access to credit, 62% use mobile payment and 87% have debit cards. Mauritius and Namibia have the highest saving levels whereas Kenya and Uganda are the highest users of mobile money. South Africa and Mauritius have the highest number with access to debit and credit cards. With high levels of debt, it can be argued that not all financial instruments/services to improve financial inclusion serve an economy well.

4.2.3 Economic growth

Table 5 shows GDP at the current price for the different regions across the world. Central Europe has the highest GDP whereas Sub Saharan Africa has the lowest GDP figures. GDP for Sub-Saharan Africa increased from 2011 to 2014 however, it then decreased between 2014 and 2017. GDP growth in Sub Saharan Africa region increased on average for the period 2011- 2017 due to high commodity prices and improved access to markets. This was despite the rising debt levels that posed a threat to growth.

Table 5: GDP current USD prices (in millions) by region

Country Name	**2011**	**2014**	**2017**
Arab World	2,501.30	2,906.92	2 591.04
East Asia & Pacific	19,647.94	21,914.17	23 999.25
Europe & Central Asia	23,180.85	23,658.23	21 438.51
European Union	18,350.56	18,635.54	17 277.69
Latin America & Caribbean	6,073.30	6,404.66	5 954.67
North America	17,312.12	19,232.66	21 049.97
South Asia	2,272.00	2,581.99	3 291.73
Sub-Saharan Africa	1,538.45	1,783.85	1 648.71
World	73,297.34	79,131.44	80 683.78

Source: World Development Indicators Online database source in 2019

4.2.4 Financial Development

Financial development is measured as a ratio of private sector credit to GDP. In simple terms, it is the rate at which the private sector invests in the financial system. North America has the highest credit to GDP ratio and globally sub Saharan Africa has the lowest. The results show a positive trend between 2011 and 2014in financial development at the global level, Sub Saharan Africa has a positive trend between 2011 to 2014 and between 2014 to 2017as expected for a developing region.

Table 6: Credit to GDP ratio

Country Name	2011	2014	2017	Changes (2011 and 2017)
Arab World	37.95	45.89	1400.36	97%
East Asia & Pacific	194.18	199.07	191.03	-2%
Europe & Central Asia	149.17	140.08	140.51	-6%
European Union	168.51	155.56	146.35	-15%
Latin America & Caribbean	67.88	76.75	81.82	17%
North America	231.02	250.60		
Sub-Saharan Africa	28.88	33.45	38.52	25%
East Asia & Pacific	126.89	153.28	195.81	35%
Latin America & the Caribbean	67.85	76.74	81.84	17%
World	163.49	169.29		

Source: World Development Indicators Online database source in 2019

4.3. Regression Analyses

Panel data estimation approach was used to estimate the impact of financial inclusion on economic growth covering 34 African countries using data from the World Bank in the Global Findex survey. The analysis is based on two regression models the first model estimates the relationship between financial inclusion and economic growth and the second model estimates the relationship between financial inclusion and financial development. The dependent variable in the first model is the logarithm of economic growth and in the second model, it is financial inclusion proxied by account ownership, mobile money account, access to ATM and index for financial inclusion.

The main explanatory variable in the model 1 is financial inclusion proxied by several variables such as account ownership, mobile money account, access to ATM and index for financial inclusion. In model 2, the main explanatory variable is financial development proxied by Credit to GDP ratio. A number of control variables are also used to explain changes in the dependent variable, these include government expenditure, export levels, school enrolment, development assistance, rule of law and foreign direct investment(see table 7).

Table 7: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Account ownership	102.00	0.26	0.19	0.02	0.89
LNGDP	102.00	23.66	1.37	21.16	27.07
Credit ratio	102.00	31.29	33.77	0.81	185.21
School enrolment	102.00	53.11	24.15	14.22	101.80
Bank ATM per 100	102.00	10.50	14.74	0.47	66.18
Government expenditure	102.00	23.57	8.20	6.01	41.96
Exports	102.00	30.98	15.96	8.15	94.03
Development assistance	102.00	6.57	7.54	0.05	35.73
Rule of Law	102.00	-0.64	0.58	-1.73	0.91
Industrialisation	102.00	25.14	13.08	2.31	76.63
Foreign Direct Investment(millions)	102.00	1,045.65	1,974.69	-7,397.30	8,841.11
Mobile money	102.00	0.27	0.17	0.05	0.79

Source: STATA Analysis

4.3.1. Impact of financial inclusion on economic growth

Table 8 shows the results from the first regression models which measures the impact of financial inclusion on economic growth. LnGDP is the dependent variable regressed against different measures of financial inclusion. There are six regression models, the first three are based on different specification models, ordinary least squares fixed and random effects models, and the Generalised Least Squares Approach (GLS) for the financial inclusion variable account ownership.

The other three models are based on the choice of financial inclusion variable, ATM per 1000, index of financial inclusion and mobile money account.

Table 8: Impact of financial inclusion on economic growth

	(1)	(2)	(3)	(4)	(5)	(6)
LNGDP	FEM	REM	GLS	FEM	FEM	FEM
Account ownership	-0.010 (0.97)	-0.150 (0.67)	1.750 (0.01)***			
Bank ATM per 1000				-0.017 (0.22)		
Mobile Money account					0.400 (0.529)	
Index of FI						0.040 (0.051)**
School enrolment	0.017 (0.00)***	0.017 (0.001)***	0.017 (0)***	0.018 (0.001)****	0.014 (0.007)***	0.007 (0.26)
Government expenditure	-0.007 (0.612)	0.005 (0.72)	0.007 (0.61)	-0.007 (0.65)	-0.009 (0.56)	-0.007 (0.55)
Exports	-0.003 (0.48)	-0.004 (0.29)	-0.034 (0)***	-0.003 (0.46)	-0.001 (0.723)	-0.040 (0.001)***
Development assistance	-0.008 (0.107)	-0.012 (0.027)**	-0.084 (0)***	-0.00793 (0.12)	-0.008 (0.118)	-0.061 (0.002)***
Rule of Law	0.350 (0.009)***	0.155 (0.248)	-1.002 (0)***	0.361 (0.006)***	0.338 (0.011)**	0.195 (0.404)
Industrialization	0.006 (0.099)**	0.008 (0.035)**	0.028 (0.003)***	0.00 (0.081)***	0.007 (0.045)**	0.046 (0)**
FDI	-6.11E-06 (0.735)	-1.6E-05 (0.401)	-4.5E-05 (0.367)	-7.14E-06 (0.68)	-7.11E-06 (0.693)	9.06E-12 (0.914)
Constant	23.293 (0)	22.748 (0)	22.421 (0)	23.257 (0)	23.199 (0)	23.296 (0)
_Wald test	40.420		137.110			48.240
_ F test	0	0.002	0	0.000	0.000	0
Obs	34	34	34	34	34	34

Source: Own STATA Analysis

Notes: *Significance level testing: * 10%, ** 5 % and *** 1 % level of significance where values in brackets are the t statistic for fixed and random effects, z statistic for generalised least squares; FEM stands for Fixed Random Effects Model, REM stands for Random Effects Model, GLS stands for Generalised Least Squares model*

Model 1 results are based on a linear fixed-effects regression model it shows no significant relationship (at 10% significance level) between financial inclusion (proxied by account ownership) and economic growth (proxied by the logarithm of GDP). School enrolment, rule of law and industrialisation, however, have significant, positive relationship with economic growth. This suggests that financial inclusion does not stimulate economic growth in sub-Saharan Africa.

Model 2 results are based on a linear random effects regression model shows no significance (at 10% significance level) between financial inclusion (proxied by account ownership) and economic growth (proxied by the logarithm of GDP). School enrolment, development assistance and industrialisation, however, are significant at 5% level of significance, showing a positive relationship with economic growth. This suggests that financial inclusion does not stimulate economic growth in sub-Saharan Africa.

Model 3 results are based on the Generalized Least Squares regression model they show significance (at 1% significance level) between financial inclusion (proxied by account ownership) and economic growth (proxied by the logarithm of GDP). In addition to five control variables are significant at the 1% level of significance. School enrolment and industrialisation show a positive relationship to whereas the rule of law, exports and development assistance are negative related to economic growth. The results show that a 1% increase in financial inclusion is likely to result in a 1% increase in economic growth. This suggests that financial inclusion stimulate economic growth in sub-Saharan Africa. Overall, the specification tests show a good fit however, there is a possibility of endogeneity being present.

Model 4 results are based on a linear fixed-effects regression model they show no significance (at 10% significance level). Rule of law, school enrolment and industrialisation are significant and they have a positive relationship with economic growth. The results suggest that banking infrastructure which is an indicator of financial inclusion (proxied using bank ATM per 1000) does not directly stimulate economic growth in sub-Saharan Africa.

Model 5 results are based on a linear fixed-effects regression model, they show no significance (at 10% significance level) between financial inclusion (proxied by mobile money account) and

economic growth (proxied by the logarithm of GDP). Mobile money account alone is not a strong variable to measure financial inclusion. However, digital financing solutions are reaching more historically excluded groups through the mobile phone even when they do not have a formal bank account with a financial institution.

Model 6 results are based on a linear fixed-effects regression model they show a significant positive relationship (at 5% significance level) between financial inclusion (proxied by the index of financial inclusion) and economic growth (proxied by the logarithm of GDP). The results show that an increase in financial inclusion is likely to increase the GDP of Sub-Saharan Africa. The financial inclusion index seems to be a good measure given that it is a computation of a number of variables that contribute to financial inclusion. Exports and development assistance have a significant negative relationship with economic growth. This is interesting as the results of the control variables differ compared to the other models where school enrolment and rule of law are significant and is not the case for model 6.

The results from Model 6 points to the importance of the design of the explanatory variable, it is based on an aggregate index as opposed to the other models which use single indicators such as account ownership, ATM access and mobile money accounts. It shows that an index made from several indicators is a better measure for financial inclusion and is more robust when applied to statistical analysis. The need to shift from the use of indicators to indices has been promulgated by Sarma who has pioneered the development of an index for financial inclusion using indicators from the Global Findex Survey dataset (Sarma, 2012).

The analysis presented above also points to the role of certain control variables in driving economic growth in sub-Saharan. Education, exports, donor support, rule of law and industrialization play a significant role in driving economic growth among the countries selected in the study.

School enrolment (measured by school enrolment) has a positive significant relationship to economic growth (in all the models except for model 6). This suggests that an increase in enrolment at secondary school level translates into economic growth in sub-Saharan Africa. The

results are in line with work done by Cooray (2009) which showed that government expenditure on economic growth is largely indirect through its impact on improved education quality.

Government expenditure gives mixed results depending on the model estimation, either a positive or negative relationship with GDP. However, in all models the variable is insignificant. This is not in line with general literature which postulates that there is a positive significant relationship between government expenditure and economic growth. It should be however noted that the impact varies from country to country. Other studies use components of government expenditure such as investment in education to measure its impact on economic growth. They established a positive relationship between economic growth and expenditure on education.

Exports have a negative significant relationship with economic growth (at 1% significance level). The result nullifies aprior assumption that exports drive economic growth in Sub-Saharan Africa. The results are not in line with literature around the "Export-led Growth Hypothesis", further research is required to explain the negative relationship.

Development assistance (measured by overseas development assistance as a percentage of GDP) has a negative significant relationship with economic growth (at 1% significance level). This suggests that dependency on donor support has a negative likelihood for economic growth in sub-Saharan Africa. A study by Abeba (2002) in Ethiopia reiterates this point it shows that international aid has a negative impact on economic growth.

Rule of law has a positive significant relationship with economic growth (at 1% significance level). A study by Kodongo and Ojah (2016) support this finding it showed that democracy and rule of law have a positive and significant effect on growth, more so in Sub Saharan Africa.

Industrialisation shows economic development (measured by manufacturing value as a percentage of GDP) has a positive significant relationship with economic growth (at 5% significance level). This emphasises the importance of growing local value addition industries which stimulates economic growth through job creation and income generation.

4.3.2 Impact of Financial development on financial inclusion

A panel data estimation was used to estimate the impact of financial development on financial inclusion for 34 African countries using on Global Findex data. Credit to GDP ratio was used to measure financial development and bank account ownership as the proxy for financial inclusion.

Table 9: Financial Development and financial inclusion

FinInc	(1)	(2)	(3)	(4)	(5)	(6)
	Account ownership			Bank access ATM per1000.	Mobile money	
	FEM	REM	GLS			FI index
Credit to GDP ratio	0.001 (0.109)	0.001 (0.299)	0.001 (0.023)**	0.022 (0.294)	0.001 (0.352)	0.100 (0)***
School enrolment	0.004 (0.109)	0.005 (0.025)**	0.000 (0.588)	0.151 (0.001)***	0.004 (0)***	0.109 (0)***
Government expenditure	0.002 (0.444)	0.009 (0.185)	-	0.044 (0.753)	0.000 (0.885)	-
Exports	0.002 (0.175)	-0.000 (0.899)	0.001 (0.246)	-0.063 (0.054)**	0.000 (0.776)	0.204 (0)***
Rule of Law	0.079 (0.03)**	-0.018 (0.748)	0.092 (0)***	1.009 (0.381)	0.064 (0.078)*	1.865 (0.037)**
Industrialisation	-0.001 (0.178)	-0.002 (0.18)	0.001 (0.326)	-0.058 (0.088)*	-0.001 (0.501)	-0.096 (0.042)**
Foreign Direct Investment	2.47E-07 (0.971)	-6.40E-07 (0.94)	-1.21E-12 (0.814)	6.07E-05 (0.216)	-5.55E-06 (0.454)	3.58E-10 (0.281)
constant	0.029 (0.769)	-0.227 (0.239)	0.036 (0.381)	4.740 (0.7216)	0.115 (0.238)	-3.452 (0.143)
_Wald test	40.940		49.310		33.160	139.890
_ F test	0	0.022	0	0.000	0	0
Obs	34	34	34	34	34	34

Source: Own STATA analysis

Notes: *Significance level testing: * 10%, ** 5 % and **** 1 % level of significance where values in brackets are the t statistic for fixed and random effects, z statistic for generalised least squares; FEM stands for Fixed Random Effects Model, REM stands for Random Effects Model, GLS stands for Generalised Least Squares model*

In the table 9 above we estimate financial inclusion as the dependent variable proxied by account ownership [1, 2, 3], Bank access [4], mobile money [5] and index [6] and regress it against credit to GDP ratio (financial development) and other control variables (school enrolment, government expenditure, exports, rule of law, industrialization and foreign direct investment).

Model 1 results are based on a linear fixed effects regression model, they show no significant relationship (at 10% significance level) between financial inclusion (proxied by account ownership) and financial development (proxied by Credit to GDP ratio). Rule of law is the only significant control variable it is positively related to financial inclusion.

Model 2 results are based on a linear random effects regression model, they show no significant relationship (at 10 % significance level) between financial inclusion (proxied by account ownership) and financial development (proxied by Credit to GDP ratio). School Enrollment is the only significant variable, it is significantly related to financial inclusion. This suggests that school enrolment increases the probability of one to be financially included. Financial inclusion requires certain literacy level hence the more a population is educated the more likely there are going to access finance products

Model 3 results are based on the Generalised Least Squares regression model and they show significance (at 5 % significance level) between financial inclusion (proxied by account ownership) and financial development (proxied by Credit to GDP ratio). A 1% percent increase in Credit to GDP ratio is likely to translate into a 2% increase in financial inclusion (account ownership).

When using ATM per 1000 as the dependent variable in Model 4, the results show no significant relationship (at 10% significance level) between financial inclusion (proxied by bank ATM per 1000) and financial development (proxied by Credit to GDP ratio).

Model 5 results are based on a linear fixed effects regression model, they show no significant relationship (at 10% significance level) between financial inclusion (proxied by mobile money account) and financial development (proxied by Credit to GDP ratio.

Model 6 shows a significant relationship (at 1% significance level) between financial inclusion (proxied by index of financial inclusion) and financial development (proxied by Credit to GDP ratio). A 1% increase in Credit to GDP ratio is likely to result in 1% increase in the index of financial inclusion.

Education, measured by school enrolment has a positive significant relationship to financial inclusion (in all the models except for model 1). The results suggest that education increases individual's financial inclusion probability.

Exports have a negative significant relationship with financial inclusion for model 4 and positive relationship for model 6 (at 1% significance level for both). The results are mixed therefore there is need for further research to ascertain the relationship between financial inclusion and exports.

Rule of law has a positive significant relationship with financial inclusion for model 4, 5 and 6. (at 1% significance level for all). The results suggest that rule of law stimulates financial inclusion in Sub Saharan Africa.

Industrialisation has a negative significant relationship with financial inclusion in model 6 (at a 5% significance level). The results is not in line with literature which states that industrialization drives financial inclusion, further analysis is required to ascertain the drivers of the relationship between financial inclusion and industrialization.

The results from Model 3 and 6 are in line with empirical findings by Evans (2016) which showed a positive relation between financial inclusion and financial development. Similar to the first regression on financial inclusion and economic growth, the estimation depends on the model specification. Hence, using GLS and a composite index gives better results.

The results from the six models used to estimate the relationship between financial inclusion and economic growth, as well as the relationship between financial development and financial inclusion show a mixed outcome. This can be explained by the model specification, for example, the GLS estimation is a better estimator than OLS as it resolves the problems of heteroscedasticity. Tests of heteroscedasticity for model 1 and 2 shows the presence of heteroscedasticity which is addressed by using GLS approach in model 3.

The results from model 1 and 2 show that OLS is not an efficient estimator due to heteroscedasticity. Heteroscedasticity occurs due to omission of a variable from the model, this is verified by the significance of the constant which points to missing values. The presence of heteroscedasticity reduces the value of variance hence the OLS estimation is unable to fulfil the best linear unbiased estimator (BLUE). This means that the OLS estimation significant tests would be inaccurate due to the presence of heteroscedasticity. To address this, classical statisticians like Atiken (1934) introduced the GLS estimator for addressing OLS limitation emanating from the presence of heteroscedasticity. GLS uses the weighted least squares to calculate efficient estimators which makes it an unbiased, consistent, efficient estimator. It is equivalent to applying ordinary least squares to a linearly transformed version of the data.

Another possible explanation for the lack of significant relationship for the OLS estimators emanates from endogeneity problems. This emanates when the explanatory variable is correlated to the error terms which means is a sign of omitted explanatory or control variables. therefore it distorts OLS estimate. Since we dropped the OLS estimator and focus on GLS in model 3, no action was taken to correct endogeneity. In theory endogeneity problem can be addressed by lagging the explanatory variable or by use of instrumental variables(IV estimator).

5. CONCLUSION

5.1 Summary

The broad aim of this study was to examine the impact of financial inclusion on economic growth and the impact of financial development on financial inclusion, with the use of panel data estimation on a sample of 34 African countries for the period 2011, 2014 and 2017. The empirical results of the study show that using account ownership [1] as a proxy for financial inclusion has no significant positive impact on economic growth. However, using the index of financial inclusion [2] shows that there is a significant relationship between financial inclusion and economic growth. The results suggest that the choice of proxy for financial inclusion is important for the robustness of the model, as the composite index has a better explanatory power than individual indicators (such as account ownership). Control variables such as education level, exports, development assistance, rule of law and industrialization also play a significant role in driving economic growth in Sub-Saharan Africa.

The study contributes significantly to the importance of measuring financial inclusion, data limitation is usually the source of mixed results for studies analyzing the financial inclusion and economic growth nexus. The study also highlights the importance of country level and time specific factors (government expenditure, rule of law, level of industrialisation) which drive financial inclusion and economic growth in Africa.

The study results were mixed on determining the relationship between financial inclusion and economic growth as well as financial inclusion and financial development. This is a result of different specifications and variable choice which were used. The Generalised Least Squares model results shows a significant positive relationship between financial inclusion and economic growth as well as a positive link between financial inclusion and financial development. However, the Least squares models results (both random and fixed) do not establish any results.

The analysis also showed the importance on the choice of the financial inclusion variable, models which use individual indicators are not significant for both the relation between financial inclusion and economic growth as well as its link to financial development. However, the use of a composite

variable, Index of financial inclusion shows significant relationship in relation to economic growth and financial development. This suggests that composite variables are more suitable for estimating the role of financial inclusion as opposed to individual indicators.

5.2 Recommendations

5.2.1 Research recommendations

The empirical results can be useful to researchers and subject matter experts as certain research recommendations can be drawn from the study. However, it is important to highlight the need to access more data on financial inclusion indicators given that the Global Findex survey index has limited time series to allow for the use of model specification which require macro panel data. Currently the survey only covers 3 periods hence limiting the capacity to capture the random effects of certain variables and their impact on financial inclusion and economic growth.

We recommend that in future data sets, long time series like the World Indicators should be used. These include deposit ratio and savings ratio. There is a need for standardised calculation for the Index of Financial Inclusion because currently researchers apply different weights in creating the index. Standardisation will allow for adoption of the index as the benchmark for measuring financial inclusion globally. More research work is needed with respect to the choice of control variables used in studies pertaining impact of financial inclusion on economic growth. The variable can be an explanatory variable however the measure might not have a direct impact on economic growth. Similar to education were we use school enrolment measuring quantity, another variable could be used to measure the quality of education and how if influences financial literacy. The choice of these variables is key to informing government policy and business practices with respect to design and delivery of programs for driving financial inclusion at a macro level.

5.2.2 Policy Recommendations

Several policy recommendations can be drawn from the study, the policy implications that emanate is that further reforms are needed to enhance financial inclusion in Africa. The effectiveness of financial institutions is more critical now than it has ever been to promote accessible and affordable finance for individuals and businesses. Governments in Africa need to invest in education as it enables financial inclusion. An educated nation has a high likelihood of increased consumption of

financial products. Focus should be on developing financial education rather than increasing enrolment, as studies have shown that it is the quality not quantity of education which matters. Government's also need to develop industries on a wide scale by investing in the financial structure of the country and promote funding of entrepreneurs to grow industries in the economy. There needs to be a shift in the rule of law by focusing more on financial institutions rather than the consumer. The regulatory framework needs to hold both the private and public sector accountable for providing diverse financial solutions to the consumer. Lastly, the negative significant relationship of exports calls for trade reforms in the region that will foster economic growth.

[1] Based on data set derived from Global Findex and World Development Indicators covering 2011, 2014 and 2017

[2] Based on Global Findex survey and World Development Indicators covering 2011 and 014

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Annexure 1: Dataset for 2011, 2014, 2017

Country	Year	Account ownership	LNGDP	Credit to GDP ratio	School enrolment	bank access (ATM per 1000)	Government expenditure	Exports	Development assistance	Rule of Law	Industrialisation level	Foreign direct investment	FDI million dollars	GDP
Angola	2011	0.39	25.37	16.64	26.68	12.78	26.67	60.67	0.19	-1.27	56.03	-3 023 770 965.84	-3 023.77	104 115 807 985.97
Angola	2014	0.29	25.57	24.21	26.68	18.22	27.97	44.70	0.17	-1.12	46.20	1 921 699 719.14	1 921.70	126 730 196 125.43
Angola	2017	0.30	25.55	29.48	26.68	18.22	16.67	29.00	0.19	-1.10	42.17	-7 397 295 409.19	-7 397.30	124 209 385 825.22
Burundi	2011	0.07	21.58	27.96	26.74	0.69	20.00	8.80	25.80	-1.14	14.81	3 354 999.18	3.35	2 355 652 125.85
Burundi	2014	0.07	21.85	25.56	40.08	1.48	20.10	8.70	19.10	-0.97	15.50	81 747 197.23	81.75	3 093 647 226.81
Burundi	2017	0.07	21.97	32.80	50.33	1.78	20.10	8.80	13.52	-1.40	15.50	316 473.45	0.32	3 477 502 178.28
Benin	2011	0.10	22.78	20.96	49.13	2.87	26.32	21.22	8.62	-0.66	21.60	161 091 309.02	161.09	7 814 081 155.65
Benin	2014	0.16	23.00	21.27	56.24	4.52	26.73	31.33	6.21	-0.49	20.77	405 197 656.02	405.20	9 707 432 015.61
Benin	2017	0.32	22.95	25.93	58.24	5.52	26.85	27.29	7.36	-0.62	21.54	184 358 176.47	184.36	9 273 558 271.65
Botswana	2011	0.30	23.48	7.82	67.89	26.58	29.32	49.95	0.76	0.67	35.05	1 371 087 724.00	1 371.09	15 682 926 895.97
Botswana	2014	0.49	23.51	8.30	68.56	27.94	27.73	60.83	0.62	0.63	33.08	515 184 275.52	515.18	16 250 774 266.67
Botswana	2017	0.45	23.58	17.05	68.56	28.94	26.05	39.83	0.61	0.51	30.26	400 570 859.79	400.57	17 406 530 780.72
Central African Republic	2011	0.03	21.51	25.44	17.67	0.94	16.16	11.51	12.19	-1.29	13.14	36 908 455.89	36.91	2 195 599 556.74
Central African Republic	2014	0.14	21.26	34.03	17.55	0.94	16.50	13.03	35.73	-1.70	16.02	3 475 007.99	3.48	1 702 899 386.14
Central African Republic	2017	0.15	21.39	34.03	17.55	0.94	16.50	12.52	25.98	-1.73	15.42	17 179 339.68	17.18	1 949 411 659.20
Cote d'Ivoire	2011	0.15	23.96	24.81	39.56	4.50	13.87	53.82	5.89	-1.27	24.20	301 577 298.55	301.58	25 381 616 734.07
Cote d'Ivoire	2014	0.15	24.29	28.98	39.62	6.66	12.73	39.27	2.69	-0.59	27.41	438 772 570.98	438.77	35 372 603 446.26
Cote d'Ivoire	2017	0.15	24.42	33.76	49.70	6.71	12.73	34.01	2.28	-0.63	24.69	674 683 759.47	674.68	40 388 624 117.11
Cameroon2011	2011	0.15	24.10	12.07	49.66	2.38	13.65	25.93	2.11	-1.07	27.19	652 411 755.81	652.41	29 337 006 833.08
Cameroon2014	2014	0.11	24.28	14.91	59.12	3.64	13.65	24.94	2.47	-0.90	27.14	724 889 079.35	724.89	34 942 948 737.40
Cameroon2017	2017	0.27	24.27	16.62	59.34	3.66	13.65	18.58	3.54	-1.02	25.29	814 001 700.79	814.00	34 798 596 482.43
Congo, Dem. Rep.2011	2011	0.04	23.98	7.90	43.35	0.49	14.65	39.52	22.52	-1.20	40.94	1 596 024 303.86	1 596.02	25 839 749 198.78
Congo, Dem. Rep.2014	2014	0.11	24.30	7.91	45.53	1.11	14.65	36.83	7.30	-1.11	42.98	1 499 572 152.50	1 499.57	35 917 650 629.61
Congo, Dem. Rep.2017	2017	0.15	24.34	7.91	45.53	1.11	14.65	35.60	6.18	-1.10	41.63	1 053 658 066.17	1 053.66	37 241 300 948.66
Congo, Rep.2011	2011	0.10	23.39	-16.13	44.35	2.33	12.65	87.28	2.44	-1.62	76.63	298 288 001.19	298.29	14 425 607 179.66

Congo, Rep.2014	2014	0.17	23.37	0.81	44.53	6.31	12.65	72.99	0.90	-1.45	69.42	2 887 256 932.11	2 887.26	14 177 437 982.26
Congo, Rep.2017	2017	0.23	22.89	0.81	44.53	8.13	12.65	94.03	1.37	-1.69	53.52	1 158 816 776.12	1 158.82	8 722 553 000.84
Algeria2011	2011	0.33	26.02	-4.51	99.65	6.07	29.53	38.79	0.10	-0.81	49.63	2 571 237 024.69	2 571.24	200 019 057 307.66
Algeria2014	2014	0.50	26.09	18.00	99.65	7.47	29.53	30.22	0.08	-0.77	42.31	1 502 206 170.56	1 502.21	213 810 022 462.43
Algeria2017	2017	0.43	25.86	66.80	99.65	7.47	29.53	22.64	0.11	-0.86	37.24	1 200 965 279.93	1 200.97	170 370 810 917.97
Egypt, Arab Rep2011	2011	0.10	26.19	74.61	78.90	9.01	29.19	20.57	0.18	-0.45	35.95	-482 700 000.00	-482.70	236 001 858 960.02
Egypt, Arab Rep2014	2014	0.14	26.45	87.06	83.19	11.85	32.92	14.24	1.19	-0.66	39.89	4 612 200 000.00	4 612.20	305 529 656 458.44
Egypt, Arab Rep2017	2017	0.32	26.18	99.05	86.49	11.85	32.92	15.82	-0.05	-0.53	33.75	7 391 700 000.00	7 391.70	235 369 129 337.71
Ghana2011	2011	0.29	24.40	27.48	56.08	4.06	26.32	36.94	4.71	0.00	23.86	3 247 588 000.00	3 247.59	39 566 292 432.86
Ghana2014	2014	0.35	24.39	38.21	64.75	8.13	26.73	28.82	2.16	0.05	34.59	3 363 389 444.44	3 363.39	39 086 625 008.62
Ghana2017	2017	0.42	24.58	30.55	69.95	8.13	26.85	35.26	2.23	0.13	30.78	3 254 990 000.00	3 254.99	47 330 016 342.57
Guinea2011	2011	0.04	22.60	24.06	38.52	0.91	29.32	32.60	3.20	-0.93	8.30	2 086 006 933.33	2 086.01	6 511 123 904.00
Guinea2014	2014	0.06	22.89	21.46	40.30	1.69	29.32	26.69	6.63	-0.81	15.71	501 870 828.62	501.87	8 765 067 644.04
Guinea2017	2017	0.15	23.07	21.46	40.30	1.69	29.32	42.73	4.39	-0.97	10.20	247 842 983.01	247.84	10 496 056 732.55
Kenya2011	2011	0.42	24.46	41.68	82.26	9.10	22.82	21.63	5.91	-0.90	18.91	1 450 474 757.08	1 450.47	41 954 942 416.91
Kenya2014	2014	0.55	24.84	44.74	89.68	9.75	22.82	18.30	4.39	-0.42	17.44	820 937 598.36	820.94	61 448 046 801.72
Kenya2017	2017	0.56	25.04	42.63	89.68	9.75	22.82	13.17	3.15	-0.41	16.53	671 488 392.89	671.49	74 938 190 654.86
Liberia2011	2011	0.19	21.16	34.63	36.75	1.43	13.44	21.81	33.53	-0.93	8.30	2 086 006 933.33	2 086.01	1 545 400 000.00
Liberia2014	2014	0.22	21.42	35.98	38.35	1.79	13.44	28.43	26.67	-0.81	15.71	501 870 828.62	501.87	2 013 000 000.00
Liberia2017	2017	0.22	21.49	35.98	36.90	1.79	13.44	24.28	20.84	-0.97	10.20	247 842 983.01	247.84	2 158 000 000.00
Lesotho2011	2011	0.18	23.02	12.25	52.49	7.91	41.96	44.15	7.79	-0.25	31.38	61 173 319.21	61.17	9 892 702 357.57
Lesotho2014	2014	0.20	23.09	17.28	52.15	10.98	37.83	35.62	3.70	-0.21	30.88	94 459 059.36	94.46	10 673 516 672.67
Lesotho2017	2017	0.33	23.17	18.98	56.02	10.98	41.30	35.62	5.07	-0.27	31.95	43 161 840.14	43.16	11 499 803 806.57
Madagascar2011	2011	0.06	23.29	15.24	36.75	8.91	19.23	26.74	4.59	-0.89	18.15	815 534 454.53	815.53	12 978 107 560.60
Madagascar2014	2014	0.06	23.39	21.44	38.35	8.98	20.47	32.76	5.67	-0.74	17.62	555 252 070.50	555.25	14 388 360 064.12
Madagascar2017	2017	0.10	23.45	27.28	36.90	8.98	19.79	35.42	6.99	-0.86	22.56	464 856 589.65	464.86	15 288 163 367.26
Mauritania 2011	2011	0.17	23.30	24.26	22.26	4.10	23.56	56.13	7.62	-0.92	45.29	588 749 564.24	588.75	13 131 168 011.81
Mauritania 2014	2014	0.20	23.55	34.93	29.68	7.65	23.76	39.15	5.07	-0.86	32.96	502 589 833.82	502.59	16 961 117 243.49
Mauritania 2017	2017	0.19	23.24	32.62	32.23	7.65	23.86	41.96	5.75	-0.60	28.37	588 217 194.76	588.22	12 333 859 926.28
Mauritius2011	2011	0.80	22.37	34.62	90.93	43.43	20.40	52.44	1.61	0.90	21.60	433 358 879.68	433.36	5 179 690 135.80

Mauritius2014	2014	0.82	22.41	34.62	99.90	45.04	20.40	51.06	0.36	0.91	19.83	418 430 127.75	418.43	5 391 475 277.24
Mauritius2017	2017	0.89	22.34	34.62	95.71	45.04	20.40	42.30	0.09	0.68	17.68	292 650 459.70	292.65	5 024 705 934.34
Malawi2011	2011	0.17	23.17	103.22	33.08	3.75	18.23	20.78	10.12	-0.16	15.41	812 753 754.65	812.75	11 518 393 367.24
Malawi2014	2014	0.16	23.27	113.96	38.11	4.78	20.47	33.70	15.84	-0.29	14.65	598 087 746.65	598.09	12 803 445 933.59
Malawi2017	2017	0.23	23.31	124.93	38.14	4.78	18.79	29.16	24.60	-0.37	14.35	277 112 167.43	277.11	13 338 147 523.01
Namibia2011	2011	0.58	22.80	26.69	36.66	50.49	34.70	45.53	2.30	0.13	27.81	811 495 035.35	811.50	8 003 300 198.30
Namibia2014	2014	0.63	22.52	15.14	39.80	54.65	36.10	38.71	1.77	0.15	29.22	445 987 359.98	445.99	6 054 750 320.33
Namibia2017	2017	0.77	22.56	15.14	38.13	54.65	36.10	36.66	1.43	0.24	28.40	445 987 359.98	445.99	6 303 277 590.80
Niger 2011	2011	0.02	22.58	14.01	14.22	0.92	41.96	26.68	0.47	-1.18	28.28	8 841 113 286.95	8 841.11	6 409 169 889.51
Niger 2014	2014	0.03	22.83	12.55	18.66	1.27	37.83	26.76	0.45	-1.05	24.64	8 841 113 286.95	8 841.11	8 229 732 168.34
Niger 2017	2017	0.10	22.82	19.09	24.60	1.27	41.30	26.76	0.92	-0.87	22.32	8 841 113 286.95	8 841.11	8 119 732 792.52
Nigeria 2011	2011	0.30	26.74	22.15	25.23	11.94	24.70	17.57	2.70	-1.28	26.19	1 734 376 994.48	1 734.38	411 743 801 711.64
Nigeria 2014	2014	0.44	27.07	21.89	32.56	16.18	26.10	8.15	1.18	-1.17	2.53	1 734 376 994.48	1 734.38	568 498 937 587.91
Nigeria 2017	2017	0.39	26.65	23.28	34.92	16.18	27.12	9.69	0.78	-1.11	2.31	1 734 376 994.48	1 734.38	375 770 713 742.76
Rwanda 2011	2011	0.33	22.60	9.16	36.66	2.73	6.01	13.65	19.41	-0.31	16.53	119 105 385.81	119.11	6 563 320 570.41
Rwanda 2014	2014	0.38	22.80	17.31	39.80	5.52	6.12	14.72	13.21	0.06	17.18	119 105 385.81	119.11	8 016 591 927.66
Rwanda 2017	2017	0.39	22.94	18.95	38.13	5.72	6.12	18.24	13.72	0.13	15.77	119 105 385.81	119.11	9 136 689 514.09
Sudan 2011	2011	0.07	23.39	23.74	37.68	3.70	31.96	17.57	2.70	-1.28	26.19	1 734 376 994.48	1 734.38	14 390 776 643.97
Sudan 2014	2014	0.15	23.45	18.82	45.04	4.42	31.83	8.15	1.18	-1.17	2.53	1 734 376 994.48	1 734.38	15 304 363 138.18
Sudan 2017	2017	0.16	23.52	18.82	45.04	4.42	31.30	9.69	0.78	-1.11	2.31	1 734 376 994.48	1 734.38	16 374 743 753.47
Senegal 2011	2011	0.06	21.80	16.09	40.88	4.56	14.14	21.19	5.99	-0.46	23.09	338 218 819.35	338.22	2 942 546 781.05
Senegal 2014	2014	0.12	22.34	17.05	49.54	4.94	18.17	21.78	5.72	-0.08	23.15	338 218 819.35	338.22	5 015 157 815.73
Senegal 2017	2017	0.20	22.05	17.23	45.42	4.94	18.05	21.73	4.44	-0.15	22.61	338 218 819.35	338.22	3 774 270 392.41
Sierra Leone 2011	2011	0.15	22.59	16.09	42.54	3.70	29.19	14.40	19.41	-0.31	7.87	950 477 688.97	950.48	
Sierra Leone 2014	2014	0.14	22.61	16.05	43.60	4.42	32.92	14.40	13.21	0.06	15.61	950 477 688.97	950.48	6 568 443 572.86
Sierra Leone 2017	2017	0.12	22.72	16.05	43.60	4.42	32.92	14.06	13.72	0.13	5.16	950 477 688.97	950.48	7 368 560 694.66
Chad 2011	2011	0.09	23.39	15.24	23.12	0.47	22.22	45.75	2.70	-1.28	23.09	433 358 879.68	433.36	
Chad 2014	2014	0.08	23.45	21.44	23.13	0.92	22.22	50.25	1.18	-1.17	23.15	418 430 127.75	418.43	
Chad 2017	2017	0.09	23.52	27.28	23.13	1.59	22.22	50.37	0.78	-1.11	22.61	292 650 459.70	292.65	
Togo 2011	2011	0.10	23.22	6.09	45.54	4.61	29.19	38.88	2.59	-0.49	36.78	98 708 321.72	98.71	12 156 380 425.08

Togo 2014	2014	0.18	23.36	11.05	45.60	5.63	32.92	34.16	1.97	-0.31	35.80	98 708 321.72	98.71	13 922 223 233.52
Togo 2017	2017	0.34	23.02	25.23	45.60	5.63	32.92	34.23	3.37	-0.29	33.90	98 708 321.72	98.71	9 981 303 726.23
Tanzania 2011	2011	0.17	24.25	17.23	65.89	4.13	18.40	38.30	3.87	-1.47	12.61	281 900 000.00	281.90	33 878 631 649.42
Tanzania 2014	2014	0.19	24.60	20.15	65.78	4.29	18.51	43.66	2.94	-1.14	14.51	281 900 000.00	281.90	48 219 734 752.18
Tanzania 2017	2017	0.21	24.68	20.15	65.89	4.32	18.60	40.94	6.65	-1.30	14.78	281 900 000.00	281.90	52 090 320 325.47
Uganda 2011	2011	0.20	23.73	18.39	89.07	3.71	21.19	20.76	13.23	-0.88	17.12	727 757 280.60	727.76	20 176 025 418.25
Uganda 2014	2014	0.28	24.03	20.84	89.07	4.26	22.92	19.41	4.57	-0.86	16.94	727 757 280.60	727.76	27 291 880 326.68
Uganda 2017	2017	0.33	23.98	23.20	89.07	4.26	22.92	15.12	7.00	-0.71	17.04	727 757 280.60	727.76	25 891 058 946.19
South Africa 2011	2011	0.54	26.76	171.54	93.30	58.05	32.32	19.02	7.26	-0.51	22.79	812 753 754.65	812.75	416 878 162 440.89
South Africa 2014	2014	0.69	26.58	185.21	101.80	66.18	34.32	18.17	5.56	-0.40	23.23	598 087 746.65	598.09	350 904 575 292.32
South Africa 2017	2017	0.67	26.58	185.21	101.80	66.18	34.32	18.14	5.01	-0.45	26.37	277 112 167.43	277.11	349 419 343 614.09
Zambia 2011	2011	0.21	23.88	21.08	90.07	6.83	20.10	30.46	7.92	-0.36	20.16	894 293 858.00	894.29	23 460 098 339.75
Zambia 2014	2014	0.31	24.02	25.81	90.07	10.18	20.10	31.47	6.12	-0.39	20.41	894 293 858.00	894.29	27 150 630 607.20
Zambia 2017	2017	0.36	23.97	21.81	90.07	10.18	20.10	29.77	7.91	-0.30	20.34	894 293 858.00	894.29	25 808 666 421.56
Zimbabwe 2011	2011	0.40	23.22	11.08	78.89	3.93	19.08	40.47	4.63	-0.46	34.44	4 139 289 122.69	4 139.29	12 098 450 700.00
Zimbabwe 2014	2014	0.17	23.49	25.81	80.12	5.24	19.08	38.82	3.75	-0.24	32.94	1 108 500 000.00	1 108.50	15 891 049 200.00
Zimbabwe 2017	2017	0.28	23.61	18.81	80.12	5.24	19.08	35.16	4.09	-0.33	35.62	1 108 500 000.00	1 108.50	17 845 821 400.00

Source: World Bank Global Findex Survey

Annexure 2: Dataset for 2011, 2014

Country	Year	GDP	LNGDP	Financial inclusion	credit ratio 2011	population density	secondary school enrolment	government expenditure	exports	Development assistance	Rule of law	industrialisation level	foreign direct investment
Angola2011	2011	104 115 807 985.97	25.37	17.45	16.64	19.43	26.68	26.67132	60.66995	0.188986	-1.27	56.02651	-3023770966
Angola2014	2014	126 730 196 125.43	25.57	12.92	24.21	21.59	27.71	27.96736	44.69503	0.17199	-1.12	46.20333	1921699719
Burundi2011	2011	2 355 652 125.85	21.58	3.40	27.96	352.16	26.74	19.9993	8.8	25.79545	-1.14	14.80968	3354999.181
Burundi2014	2014	3 093 647 226.81	21.85	3.39	25.56	385.19	40.08	18.29776	8.700002	19.096	-0.97	15.49821	81747197.23
Benin2011	2011	7 814 081 155.65	22.78	5.50	25.44	83.90	56.63	42.57	21.22206	8.624775	-0.66	21.59905	161091309
Benin2014	2014	9 707 432 015.61	23.00	7.54	34.03	91.23	62.30	42.88	31.33347	6.212966	-0.49	20.76675	405197656
Burkina Faso2011	2011	10 724 063 457.83	23.10	4.97	21.44	58.78	30.26	36.79	25.00369	9.50714	-1.70	24.7024	143657274.8
Burkina Faso2014	2014	12 377 391 462.64	23.24	6.68	32.03	64.28	30.35	36.89	22.26164	9.346949	-1.27	19.80378	356821732.4
Botswana2011	2011	15 682 926 895.97	23.48	14.63	7.82	3.62	67.89	29.31866	49.95054	0.761051	0.67	35.04655	1371087724
Botswana2014	2014	16 250 774 266.67	23.51	22.63	8.30	3.83	68.56	27.73288	60.83019	0.624766	0.63	33.07618	515184275.5
Central African Republic2011	2011	2 195 599 556.74	21.51	1.81	25.44	7.19	17.67	16.15539	11.51483	12.18737	-1.29	13.13551	36908455.89
Central African Republic2014	2014	1 702 899 386.14	21.26	1.96	34.03	7.25	17.91	17.14	13.03009	35.72944	-1.70	16.02349	3475007.991
Cote d'Ivoire2011	2011	25 381 616 734.07	23.96	7.85	24.81	65.71	39.62	13.87458	53.81996	5.893869	-1.27	24.20137	301577298.6
Cote d'Ivoire2014	2014	35 372 603 446.26	24.29	10.03	28.98	70.85	39.71	12.7293	39.27465	2.686378	-0.59	27.41005	438772571
Cameroon2011	2011	29 337 006 833.08	24.10	5.54	12.07	14.26	49.66	22.82284	25.93207	2.108161	-1.07	27.19177	652411755.8
Cameroon2014	2014	34 942 948 737.40	24.28	4.55	14.91	15.46	59.12	13.44486	24.93807	2.470518	-0.90	27.13978	724889079.4
Congo, Dem. Rep 2011	2011	25 839 749 198.78	23.98	1.89	7.90	29.43	43.35	29.31866	39.51562	22.51718	-1.20	40.94274	1596024304
Congo, Dem. Rep 2014	2014	35 917 650 629.61	24.30	4.68	7.91	32.52	45.53	27.73288	36.83219	7.301758	-1.11	42.97985	1499572152
Congo, Rep 2011	2011	14 425 607 179.66	23.39	5.02	-16.13	13.21	39.62	12.64695	87.28305	2.438428	-1.62	76.62564	298288001.2
Congo, Rep 2014	2014	14 177 437 982.26	23.37	7.03	0.81	14.26	39.71	39.31866	72.98675	0.904511	-1.45	69.41703	2887256932
Djibouti 2011	2011	1 239 144 501.78	20.94	7.42	34.10	15.46	43.35	37.73288	35.16	11.46	-0.81	17.25	79000230.7
Djibouti 2014	2014	1 455 035 088.75	21.10	7.49	36.09	16.42	45.53	28.92	34.94219	11.25072	-0.87	17.48018	152998382.3
Algeria2011	2011	200 019 057 307.66	26.02	7.97	-4.51	86.29	99.65	29.53019	38.78695	0.097701	-0.81	49.62516	2571237025
Algeria2014	2014	213 810 022 462.43	26.09	12.50	18.00	92.23	99.80	29.78	30.21912	0.076791	-0.77	42.31057	1502206171
Egypt, Arab Rep2011	2011	236 001 858 960.02	26.19	6.19	74.61	92.79	78.90	32.79	20.56743	0.184269	-0.45	35.95172	-482700000

Egypt, Arab Rep2014	2014	305 529 656 458.44	26.45	7.72	87.06	96.89	83.19	32.89	14.24413	1.186052	-0.66	39.89033	4612200000
Gabon2011	2011	18 186 515 199.97	23.62	7.19	11.45	110.41	56.08	42.57	61.74437	0.44262	-0.46	60.88121	874873163.5
Gabon2014	2014	18 179 666 879.04	23.62	12.82	13.82	118.50	64.75	42.88	44.52089	0.645669	-0.51	52.72224	1047702841
Ghana2011	2011	39 566 292 432.86	24.40	10.48	27.48	44.91	38.52	36.79	36.93661	4.705401	0.00	23.86366	3247588000
Ghana2014	2014	39 086 625 008.62	24.39	13.23	38.21	48.04	40.30	36.89	28.82108	2.164706	0.05	34.59206	3363389444
Guinea2011	2011	6 511 123 904.00	22.60	2.79	24.06	3.52	49.66	32.66	32.60224	3.197915	-1.45	32.6144	956060000
Guinea2014	2014	8 765 067 644.04	22.89	3.41	21.46	3.53	59.12	32.82284	26.68851	6.632719	-1.36	29.69417	-73758603.66
Gambia, 2011	2011	898 290 989.94	20.62	1.89	43.83	172.57	36.75	41.57	26.45759	15.66338	-0.54	13.46228	36077136.08
Gambia, 2014	2014	833 249 466.85	20.54	4.68	54.82	189.51	38.35	41.76	19.35002	8.157087	-0.69	13.62054	23014092.04
Guinea-Bissau2011	2011	1 099 385 895.08	20.82	5.02	11.88	56.76	41.14	36.79	25.67401	10.91948	-1.31	12.40179	25024047.39
Guinea-Bissau2014	2014	1 053 512 334.26	20.78	7.03	19.65	61.37	43.94	36.89	20.2074	10.10682	-1.33	14.41505	28852727.69
Equatorial Guinea 2011	2011	21 329 395 900.87	23.78	7.42	-2.81	35.45	25.23	4.973677	75.09531	0.177884	-1.27	78.06487	1975000000
Equatorial Guinea 2014	2014	21 736 500 712.96	23.80	7.66	3.35	40.26	32.56	7.092118	65.96329	0.003519	-1.45	70.19095	167875165.6
Kenya 2011	2011	41 954 942 416.91	24.46	17.95	41.68	74.65	82.26	22.66	21.62597	5.907309	-0.90	18.90694	1450474757
Kenya 2014	2014	61 448 046 801.72	24.84	27.09	44.74	80.87	89.68	22.82284	18.29698	4.392602	-0.42	17.44177	820937598.4
Liberia2011	2011	1 545 400 000.00	21.16	8.30	34.63	42.26	90.93	13.44486	21.8073	33.53269	-0.93	8.300117	2086006933
Liberia2014	2014	2 013 000 000.00	21.42	8.12	35.98	45.58	37.97	13.53	28.43219	26.66631	-0.81	15.70939	501870828.6
Libya2011	2011	34 699 395 523.61	24.27	2.79	-114.69	3.52	25.23	12.24227	54.82945	1.84463	-1.20	17.62304	50000000
Libya2014	2014	41 142 722 414.34	24.44	3.41	-42.00	3.53	32.56	12.95836	47.01433	0.503968	-1.51	20.64908	52100000
Lesotho2011	2011	2 788 022 889.09	21.75	7.42	0.63	67.99	52.49	41.96413	44.14582	7.786769	-0.25	31.3767	61173319.21
Lesotho2014	2014	2 614 576 996.40	21.68	7.66	0.60	70.68	52.15	42.66	35.61793	3.704194	-0.21	30.87841	94459059.36
Madagascar2011	2011	9 892 702 357.57	23.02	2.65	12.25	37.37	36.75	34.69605	26.7428	4.593416	-0.89	18.14698	815534454.5
Madagascar2014	2014	10 673 516 672.67	23.09	3.46	17.28	40.55	38.35	36.1004	32.75823	5.668915	-0.74	17.62304	555252070.5
Mali2011	2011	12 978 107 560.60	23.29	5.04	15.24	12.74	41.14	12.24227	42.44415	10.12774	-0.50	20.64908	556147161.6
Mali2014	2014	14 388 360 064.12	23.39	7.22	21.44	13.90	43.94	12.95836	41.06284	8.851748	-0.64	18.38497	144023010.6
Mozambique2011	2011	13 131 168 011.81	23.30	8.38	24.26	31.71	25.23	23.70814	30.77717	15.96045	-0.57	17.75245	488749564.2
Mozambique2014	2014	16 961 117 243.49	23.55	7.83	34.93	34.60	32.56	23.59	30.70157	12.56629	-0.81	18.76544	402589833.8
Mauritania2011	2011	5 179 690 135.80	22.37	8.72	34.62	3.61	22.26	7.91	56.13291	7.6176	-0.92	45.29436	3663937118

Mauritania2014	2014	5 391 475 277.24	22.41	10.68	35.76	3.94	29.68	8.93	39.14783	5.073495	-0.86	32.96015	4998799334
Mauritius2011	2011	11 518 393 367.24	23.17	35.52	103.22	616.95	90.93	20.4	52.44415	1.607726	0.90	21.59958	588749564.2
Mauritius2014	2014	12 803 445 933.59	23.27	35.72	113.96	621.15	99.90	22.28734	51.06284	0.357316	0.91	19.83259	502589833.8
Malawi2011	2011	8 003 300 198.30	22.80	8.38	26.69	165.76	33.08	18.22909	20.77717	10.11964	-0.16	15.41374	433358879.7
Malawi2014	2014	6 054 750 320.33	22.52	7.83	15.14	181.04	88.11	20.4693	33.70157	15.84169	-0.29	14.64902	418430127.8
Namibia2011	2011	12 409 629 835.70	23.24	25.02	50.19	2.69	86.66	24.69605	23.64542	10.13933	-0.39	15.94143	812753754.6
Namibia2014	2014	12 786 078 008.24	23.27	24.22	55.54	2.88	39.80	26.1004	24.72211	11.36145	-0.65	19.37616	598087746.6
Niger2011	2011	6 409 169 889.51	22.58	1.78	14.01	13.47	14.22	34.69605	45.52616	2.303991	0.13	27.80883	811495035.4
Niger2014	2014	8 229 732 168.34	22.83	2.29	12.55	15.12	18.66	36.1004	38.71407	1.772945	0.15	29.21535	445987360
Nigeria2011	2011	411 743 801 711.64	26.74	10.74	22.15	178.83	45.54	27.57	23.64542	10.13933	-0.39	15.94143	1065789606
Nigeria2014	2014	568 498 937 587.91	27.07	14.62	21.89	193.75	45.60	28.68	24.72211	11.36145	-0.65	19.37616	821872392.1
Rwanda 2011	2011	6 563 320 570.41	22.60	11.56	9.16	426.27	36.66	6.008895	36.89	0.467	-1.18	28.2778	8841113287
Rwanda 2014	2014	8 016 591 927.66	22.80	14.10	17.31	459.88	39.80	6.12	38.14913	0.451042	-1.05	24.64361	4651465948
Sudan2011	2011	67 327 289 319.73	24.93	3.59	23.74	69.08	49.59	17.91588	13.64542	19.41404	-0.31	16.52978	119105385.8
Sudan2014	2014	82 151 588 418.83	25.13	6.23	18.82	75.55	49.54	18.91588	14.72211	13.20584	0.06	17.18369	314742419
Senegal2011	2011	14 390 776 643.97	23.39	5.27	32.12	13.47	89.79	34.35	17.56763	2.698705	-1.28	26.19136	1734376994
Senegal2014	2014	15 304 363 138.18	23.45	7.25	37.14	15.12	90.10	34.67	8.149135	1.178598	-1.17	2.525526	1251280889
South Sudan 2011	2011	17 273 335 563.73	23.57	5.78	-6.34	12.74	23.12	14.13519	21.18584	2.590915	-0.46	2.745	338218819.4
South Sudan 2014	2014	15 099 661 016.95	23.44	3.86	19.87	13.90	23.13	18.16682	21.7783	1.96843	-0.08	23.09312	402561894.3
Eswatini2011	2011	4 820 499 924.25	22.30	16.95	21.89	71.24	59.65	47.79	71.10982	3.992515	-1.38	23.1526	1035825.73
Eswatini2014	2014	4 377 293 816.29	22.20	16.49	16.65	75.30	64.76	49.12	34.00907	14.39795	-1.82	23.456	1672550443
Chad2011	2011	12 156 380 425.08	23.22	5.78	6.09	9.76	53.12	22.22328	45.75039	2.590915	-0.49	36.77749	98708321.72
Chad2014	2014	13 922 223 233.52	23.36	3.86	11.05	10.78	53.13	23.12	50.24535	1.96843	-0.31	35.80422	25782635.17
Togo 2011	2011	3 756 023 159.96	22.05	5.66	34.57	122.80	55.07	41.32001	38.87726	3.865172	-1.47	12.609	281900000
Togo 2014	2014	4 482 880 424.14	22.22	6.77	40.53	132.91	54.99	42.32137	34.16136	2.942669	-1.14	14.51112	-675545847.1
Tunisia 2011	2011	45 810 626 509.45	24.55	17.97	83.17	69.27	92.06	32.32001	38.29909	13.2259	-0.88	17.12206	727757280.6
Tunisia 2014	2014	47 587 913 058.84	24.59	17.81	86.45	71.73	87.65	34.32137	43.66067	4.570749	-0.86	16.94394	53948489.72
Tanzania2011	2011	33 878 631 649.42	24.25	8.55	17.23	53.70	78.89	17.99	20.75642	7.263371	-0.51	22.79385	1229361018

Tanzania2014	2014	48 219 734 752.18	24.60	12.28	20.15	58.97	80.12	18.51099	19.41418	5.556555	-0.40	23.227	1672550443
Uganda 2011	2011	20 176 025 418.25	23.73	9.92	18.39	175.01	89.67	42.32001	19.01757	7.918257	-0.36	20.1562	894293858
Uganda 2014	2014	27 291 880 326.68	24.03	17.63	20.84	193.66	90.12	44.32137	18.17026	6.122056	-0.39	20.41053	1058564540
South Africa 2011	2011	416 878 162 440.89	26.76	27.78	171.54	43.08	93.30	32.32001	30.46094	0.344277	0.15	26.94254	4139289123
South Africa 2014	2014	350 904 575 292.32	26.58	32.49	185.21	44.96	94.80	34.32137	31.46865	0.315694	0.18	26.54514	5791659020
Zambia 2011	2011	23 460 098 339.75	23.88	9.80	21.08	19.19	82.61	22.10175	40.47022	4.633398	-0.46	34.44343	1108500000
Zambia 2014	2014	27 150 630 607.20	24.02	11.81	25.81	21.01	84.56	29.07699	38.82243	3.746119	-0.24	32.94433	1507800000
Zimbabwe 2011	2011	12 098 450 700.00	23.22	13.55	17.23	37.19	78.89	20.10175	34.8008	5.970939	-1.78	21.72029	344300000
Zimbabwe 2014	2014	15 891 049 200.00	23.49	13.08	20.15	39.84	80.12	19.07699	20.93015	4.310819	-1.43	23.71855	472800000

Source: Asia Development Bank