FINANCIAL DEVELOPMENT AND ECONOMIC GROWTH IN AFRICA: A DYNAMIC CAUSAL RELATIONSHIP

BY:
SAMUEL BOATENG FOSU

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ABSTRACT

This study uses information from World Development Indicator database published by World Bank to examine the relationship between financial development and economic growth in twenty eight African Countries from 1975 to 2011. Westerlund cointegration and GMM dynamic panel techniques are used to examine the causal links between financial development and growth. The results suggest that there exist long-run relationship between financial development and economic growth. Financial development leads to economic growth when domestic credit provided by the banking sector is used as a proxy for financial development. The result provides evidence that there exist bidirectional causality between financial development and growth when financial development is measured by domestic credit provided to the private sector and liquid liabilities. The implication of the results is that there is the need to further develop the financial sector to stimulate real growth in the economies of Africa. Development of microfinance is imperative to engender growth process in the rural areas.
CHAPTER ONE

1.0 Introduction

Over the past decade, extensive interest has focused on the relationship between financial development and economic growth. Most empirical literature suggests a relationship where financial development increases economic growth. McKinnon (1973), Shaw (1973) often known as ‘McKinnon-Shaw’ hypothesis, and Demetriades and Hussein (1996) argue that financial repression hinders economic growth through its negative impact on financial development. Theoretical work by Greenwood and Jovanovic (1990) and Bencivenga and Smith (1991) also support the claim that efficient financial systems stimulate a sound economic development. Contrary to the above, other literatures hypothesize that, it is economic growth that promotes financial development (Robinson, 1952 and Lucas, 1988).

There are some theoretical and empirical works in the finance literature which show that financial development leads to economic growth and vice versa. Levine and Zervos, 1998; King and Levine 1993a and Demetriades and Andrianova (2003) demonstrate that there has not been a general consensus regarding the direction of causality between economic growth and financial development. The contradictory evidence related to cause and effect can be attributed to the particular data used to examine the causality, inadequate long term data to capture rate of change, country’s specific policies and institutional characteristics such as law, governance etc. In the Africa context, there is mixed evidence of the long-run relationship between financial development and economic growth and the causality between them (Akinlo and Egbetunde, 2010; Agbetsiafe, 2004; Baliamoune-Lutz, 2008 and Acaravci, et al., 2009). Most empirical
work uses limited number of countries (Baliamoune-Lutz, 2008; Abu-Bader and Abu Qarn, 2008 and Agbetsiafe, 2004).

In light of the preceding analysis, this work is set to examine the following research questions:

- Are there any association between financial development and economic growth in Africa?
- And if there is such an association, what is the causality between them?
- How can the financial sector be structured to stimulate steady-state growth process?

In view of the above stated problems, the objectives of this research are:

- To examine the long-run relationship between financial development and economic growth;
- To ascertain the direction of causality between financial development and economic growth; and
- To provide a pragmatic approaches to further develop the financial sector and growth process in the study area.

Panel data covering a period of 37 years from 1975-2011 for 28 countries is used in this study. The econometrics techniques used are Fisher Augmented Dickey-Fuller and Levin-Lin-Chu tests for dynamic heterogeneous panel data developed by Choi (2001) and Levin-Lin-Chu (2002) respectively. The four statistical tests developed by Westerlund (2007) to shed evidence on the existence of long-term association between financial development and economic growth.
The generalized method of moments (GMM) approach for dynamic panel data developed by Arellano-Bond (1991) is also used to determine the causality between financial development indicators and economic growth.

The empirical results of this work conform to the theory that there is a long-run relationship between financial development and economic growth. All the variables of concern are integrated of order I(0). The four statistic tests developed by Westerlund (2007) support the evidence of the existence of long-term association between financial development and economic growth. The results of the GMM dynamic panel analysis provide evidence that financial development proxy by domestic credit provided by the banking sector causes real growth in the economies of Africa. There are bidirectional causality between financial development and growth when financial development is measured by domestic credit provided to the private sector and liquid liabilities. These results support the findings of (Baliamoune-Lutz, 2008 and Akinlo and Egbetunde, 2010). This study provides evidence that past economic performance has positive impact on the current real growth of the economy.

This research is justified in that an understanding of the causal links between financial development and growth will stimulate the intensity with which researchers, stakeholders and policymakers attempt to identify and implement appropriate financial and economic reforms in Africa. Early work by Gurley and Shaw (1955), Hicks (1969) and Goldsmith (1969) suggest that efficient financial systems are very essential in facilitating economic development. Inefficient financial systems slow down the growth process in an economy. It is therefore important to structure policies that aim to enhance efficiency and deepening of the
financial sector to promote economic growth process. Demetriades and Andrianova (2003) demonstrate this with their conclusion that “irrespective of the direction of causality between finance and growth found in empirical studies, a better understanding of the factors that promote financial development—in a broader sense than perhaps may be suggested by various indicators—is likely to shed light on the mechanisms and policies that may promote economic growth” (pp 10). This study will add to existing literature on finance and economic growth.

The rest of the study proceeds as follows: an in-depth review of literature with respect to the functions of the financial sector. Panel studies especially in Africa and theoretical and empirical studies on finance and growth are critically discussed in chapter two. Chapter three presents the data set and definition of financial development and growth indicators. Model specification and the methodology used are also discussed in this chapter. Chapter four discusses the empirical results of the study while chapter five captures the conclusion and recommendations.
CHAPTER TWO

2.0 Literature Review

2.1 Functions of Financial Systems

A developed and well-functioning financial system can contribute to economic growth through two diverse but complementary mechanisms as emphasized by growth theory (Ang 2008). It facilitates economic growth through the process of total factor productivity and capital accumulation. The debt-accumulation hypothesis of Gurley and Shaw (1955) is the foundational ground on which the capital accumulation channel also known as ‘quantitative channel’ is built up. This channel is based on the efficiency of the financial intermediary to locate “idle” funds, pool it together and allocate it to the most economically viable projects. A continual and efficient allocation of capital towards viable investment ventures may lead to higher growth. The other channel focuses on the means to minimize the informational asymmetries involved in the financial sector. Financial improvement is one way to ensure efficient allocation of resources and monitoring of projects. In a more elaborative analysis, the role played by the financial system is grouped into the following sections: savings mobilization, risk management, resources allocation, facilitating transaction and exercising corporate control (Ang, 2008 and Levine, 1997).

2.1.1 Mobilization of savings

Savings mobilization from depositors is difficult and expensive. Levine (1997) propounds two forms of costs involve in mobilization of savings: (i) addressing informational asymmetries related to the security of savers funds and (ii) addressing transaction costs incurred in drawing
savings from diverse sources. Resource mobilization involves reallocation of surplus funds to investors. Savings may be fragmented in nature and inadequate to wholly meet an investment need of an investor. The intermediary will therefore gather these fragmented funds together and then lend it to prospective investors. In this way, the financial system directs savings and investment decisions, unlocking resources in any unproductive unit towards the development of the economy.

2.1.2 Efficient Allocation of Capital

It is difficult to acquire and disseminate information in a world characterized by inefficiencies. Due to the difficulty involved, it costs much to acquire the needed information. The cost associated with information acquisition calls for the emergence of financial intermediaries. Under certain circumstances, initial fixed costs are incurred in order to carry out such activities. Levine (1997) stressed that if there is a fixed cost to be incurred in order to obtain information about production technology, each investor will have to bear the full cost to attain it. But on the other hand, a group of investors can pool resources together to obtain it at a comparably lower cost. The average fixed cost borne by each investor of the group will be much lower compare to that of a single investor. The foregoing analysis calls for the operation of financial intermediary to collate information at a relatively lower cost. Since the financial intermediary is a large body, it will be able to acquire, process and disseminate information about profitable investment projects. This facilitates the re-allocation of capital from non-productive uses to higher value use which could be of immense contribution to economic development. Efficient resource allocation can also be guided by a well-functioning capital market. Levine argues that as stock markets grow to become large and efficient, investors and other market participants may find it beneficial
to obtain information about firms. Efficient, liquid and large stock market will therefore facilitate information acquisition which would lead to proficient resource allocation that translates to economic growth. Empirical evidence is provided by Wurgler (2000) that when information on companies are incorporated into prices of stocks and capital allocation is efficient, capital will be guided to good investment projects.

2.1.3 Risk Management

Information and transaction costs can be mitigated by the emergence of the financial system. Due to the lack of informational disclosure, investors are reluctant to invest in long-term projects. Some vibrant investment opportunities require a large sum of capital to ensure completion. Risk averse-investors are reluctant to put all their resources in one project. This situation allows high return investment projects to pass-by unexploited. The financial system helps investors to take advantage of these high-return investment projects by diversifying their portfolios. Efficient financial systems pool resources from diverse sources enabling investors to hold assets in different ventures hence hedging against risk. When investors are hard pressed for funds the only thing they can do is to liquidate their long-term investment project in the absence of financial system. Thus, financial systems help investors to see to the maturity of their investment by providing the needed support. Liquidity risk is therefore reduced. Hicks (1969) asserts that the principal cause of the industrial revolution in England was the development in the capital market that alleviated liquidity risk at the time.
2.2 Theoretical Studies

A number of economists have propounded theoretical studies on the impact of the financial system on economic development. Odedokun (1998) put forward that “a line of theoretical studies on the role of financial development on economic growth is that which regards monetary assets as a vital input in the production process”. He argues that real money balances are thought to have a positive influence in the production process. This means that if the quantity of real money balance increases, there is the possibility that the volume of output in the economy will also increase all things being equal. Real money balances is therefore considered as contributing factors like capital, labor and technology that affect production. Friedman (1959) and Johnson (1969) are some of the earliest theoretical works which support this line of analysis that real money balance plays a critical role in the production function. These works add to the earlier work put forward by Samuelson (1947) and Patinkin (1965) on real money balance parameterized in aggregate utility function. From the foregoing analysis, if there is a positive association between the produced output at any given time and real money balances, an increase in real money balances will lead to growth in real output.

A review of the work of Odedokun (1998) shows another role play by the financial systems on the level of economic growth, which is less mathematical compared to the previous theoretical work. This theoretical study was championed by Gurley and Shaw (1960), Patrick (1966) and Goldsmith (1969). Their theoretical analysis was geared towards economic growth and placed more emphasis on developing countries. Odedokun argues that “The central message of this category of studies is the demonstration of the positive role of the size of the financial sector, as
measured by the volume and/or growth of real money balances, on economic development or growth”.

McKinnon (1973), Shaw (1973), Galbis (1977) and Mathieson (1980) provide some of the theoretical work on the financial development and economic growth nexus. Their studies demonstrate the impact of the financial policies on economic development (see Odedokun, 1998). Broad arrays of financial indicators are partly integrated together to analyze the role played by the financial system (Goldsmith, 1969; McKinnon, 1973; Girma and Shortland, 2004). Efficiency and liberalization of the financial sector are the main issues of discussion to create the enabling environment for the private sector to ensure effective resources allocation, risk management and information gathering.

2.3 Empirical work on Financial Development and Economic Growth

A lot of studies have gone on to investigate the relationship between financial development and economic growth (Ghirmay, 2004; Beck and Levine, 2004; Odhiambo, 2007). Studies undertaken to examine the long-run relationship between finance and growth have not yet provided any empirical conclusion as to whether financial development is the true causality of economic growth or vice versa. Some studies found out that financial development is a growing factor for economic growth (Levine and Zervos, 1998; King and Levine 1993a). There has not been a total consensus regarding the direction of causality between these two variables. This conclusion is due to the data type adopted to examine the causality, inadequate long time data to assimilate rate of change, country’s specific policies and institutional characteristics. Demetriades and Andrianova (2003) provide a pragmatic solution to these problems by
suggesting that “We need to have a lot more results, using larger data sets and better econometric methods, before we can conclude with a reasonable degree of confidence that finance leads economic growth in every country in the world” (page 10). For instance, Demetriades and Hussein (1996) find that causality between financial deepening and economic growth differs from one country to another when they examined the long-run relationship between these variables for 16 countries. For some countries financial development leads to economic growth, while in others, growth causes financial development. Bi-directional causality was also in existence in some countries. Demetriades and Hussein concluded that “economic policies are country-specific and their success depends on the effectiveness of the institutions which implement them. There can, therefore, be no 'wholesale' acceptance of the view that 'finance leads growth' as there can be no 'wholesale' acceptance of the view that 'finance follows growth’”. They, however, caution the danger of making any meaningful conclusion with regard to cross-section country study which assumes all countries to possess similar characteristics. The empirical work conducted by Muhsin Kar and Pentecost (2000) in Turkey also shows that the direction of causality between development in the financial sector and economic growth is responsive to the financial development indicators used. Financial development caused economic growth when money to income ratio was used as the indicator of financial development. But when private credit ratio, domestic credit ratio and bank deposits were used, the direction of causality ran from economic growth to financial development.

The financial development and economic growth nexus has received an extensive attention in Africa (Agbetsiafe, 2004; Ghirmay, 2004; Atindehou et al., 2005, Odhiambo, 2007; Abu-Bader and Abu-Qarn, 2008; Baliamoune-Lutz, 2008; Akinlo and Egbetunde, 2010 and Acaravci, et al.,
Agbetsiafe (2004) finds causality running from financial development to economic growth in all the seven African countries investigated. The results by Ghirmay (2004) provided evidence in support of finance-led growth in eight out of the thirteen sub-Saharan countries examined. Baliamoune-Lutz (2008) finds bidirectional results for North African countries. Abu-Bader and Abu Qarn (2008) also using data from Egypt, Morocco and Tunisia obtained results which support the long-run relationship from finance to economic growth. Akinlo and Egbetunde (2010) using data from ten countries, found out that financial development causes economic growth in four countries while economic growth causes financial development in one of the countries. However, a bidirectional relationship exists between financial development and economic growth was found in five countries. Acaravci, et al. (2009) used panel data from 24 sub-Saharan African countries from 1975 to 2005 to examine the relationship between financial development and economic growth. Their results indicate no long-run association between these two variables when subjecting it to panel co-integration analysis. Their empirical results show a bidirectional causal relationship between economic growth and the financial depth indicator of domestic credit provided by the banking sector.

Panel data has been used to investigate the relationship between financial development and economic growth in other part of the world. Habibullah and Eng (2006) studied 13 Asian developing countries from 1990 to 1998 and found out that financial depth promotes growth. Wang and Zhou (2010) using dynamic panel data from the regions of China found out that efficient financial systems promote economic growth.
Most of the countries used in this study do not have an established capital market. As a result, we cannot assess the impact that the capital market contributes to the long-run steady growth of the economy of the countries under study. Most of the countries with capital market were established in late 1990s and early 2000s. These markets are infants and data on its activities are rarely available. Market capitalization of listed companies to nominal GDP, total value of stock traded to nominal GDP and turnover ratio of stocks traded are often used to gauge the development of the capital market to stimulate growth in the economy. In the absence of these indicators of capital market, only bank based indicators will be used. Ghirmay (2004) also recounts that most of the financial growth has occurred within the banking system in African countries.

2.4 Microfinance Institutions

The aim of this study is to examine the causal links between financial development and economic growth in Africa. In the finance literature, financial development is measured by data from the traditional sector of the financial service Kar et al. (2010). Information from informal and semi-formation financial institutions are rarely used. This is primarily due to lack of data availability. Empirical Studies in India and Bangladesh show that development in the microcredit facilitates economic growth and poverty reduction Khandker (2005 and 1998). The review of microfinance institutions here is to show its significant role in helping poor people to access credit to start up new or expand existing business to facilitate economic growth.

In the finance literature, financial development is measured by data from the traditional sector of the financial service Kar et al. (2010). Normally, activities of these traditional institutions do not effectively affect the poor through poverty reduction. Banks and other traditional institutions
usually provide credit to corporate entities, high net worth individual and people who have attractive credit history. This is largely because these institutions are in the business to make profit and create value for their shareholders. Basu, et al, (2004) account that very few people in Ghana and Tanzania have access to credit facilities from the banking sector representing about 5-6% of the population considering that in most Africa countries the poor occupy the largest part of the population. The poor in the society rarely benefit from these institutions. To look into the impact of financial development on poverty reduction, it is imperative to pay much attention to institutions which focus on the poor by making credit available to them to improve their wellbeing.

Microfinance or microcredit institution (MFI) makes credit available to the poor who mostly live in the rural areas. Sherief and Sharief (2008) show that MFI provides small loans to borrowers without requiring conventional collateral security which is predominant feature in credit administration in the traditional financial institutions. Bornstein (1996) outlines some basic characteristics of the microfinance as: short loan duration usually less than two years, higher interest rates than those charged by formal banks, loan facilities are invested in productive ventures such as trading, agriculture, processing industries, art industries etc instead on consumption. Khandker (2005) outlined savings mobilization and collateral-free group-based lending as some strategic initiatives intertwined in microfinance programs to alleviate problems as exorbitant interest payment and weak outreach which are associated with the traditional financial sector. The costs involved in intermediating microcredit at this level are often high with respect to ensuring that borrowers maintain proper credit discipline and monitoring of borrowers’ action arising from moral hazard (Khandker 1998; Morduch 1999; Khalily et al. 2000).
Khandker (2005) in an empirical study using household survey panel data from Bangladesh asserts that “Microfinance organizations in Bangladesh, unlike their formal counterparts in the financial sector, have made great strides in delivering financial services (both savings and credit) to the poor, especially women, at very low loan default rates”. Khandker (1998) on the effect of BRAC project, Grameen Bank and the Bangladesh Rural Development Board’s (BRDB) Rural Development 12 program, using three microfinance institutions found out that on yearly basis about 5% of the people in the study domain would be able to get their families off the poverty line by accessing credit from one of the microcredit programs.

One critical downside characteristics of microfinance is high borrowing cost. Most of the microfinance secures funds from the investment banks to give out as loans. So they add their profit margin to it raising the borrowing rate. In addition, since most poor people don’t have credible credit score and collateral to secure loans, they are often classified as high risk borrowers. As a result, they pay more for loan servicing. This, to a large extent, reduces the speed of escaping from the poverty. Notwithstanding, the role microfinance plays in channeling credit to the poor to start and expand existing businesses to improve their living standard cannot be underestimated. Sherief and Sharief (2008) account for the major challenges faced by MFI’s in the rural areas in Africa. They indicate that most MFI avoid operating in deprived rural areas primarily because of the high cost and risk involved in working there. The integrated challenges enshrined in those areas are lack of basic infrastructural development, low population density and scarce economic activities which impede efficient functioning of microfinance. Contrary to the development of microfinance in most rural areas in Asia, the authors attribute it to the good
communication infrastructure, high population density and better input-output trading. These factors contribute to the success and sustainability of the MFI. Microfinance serves a different population than the commercial banking sector. A growing microfinance sector may contribute to economic growth although little empirical evidence is available.
CHAPTER THREE

3.0 Data Set and Methodology

3.1 Data and data sources

All the data used in this study is extracted from World Development Indicator database published by World Bank (2012). The period of study is from 1975 to 2011 and the data frequency is annual. The study is conducted for twenty eight African countries. Algeria, Benin, Burkina Faso, Botswana, Burundi, Cameroon, Central Africa Republic, Chad, Congo Republic, Cote d’Ivoire, Egypt, Gabon, Gambia, Ghana, Kenya, Madagascar, Malawi, Mali, Nigeria, Senegal, Seychelles, Sierra Leone, South Africa, Sudan, Swaziland, Togo, Tunisia and Zambia. The choice of sample countries is based on data availability covering the study period. All the countries used have data for the study period. The selected 28 countries were chosen out of 51 countries.

GDP per capita is gross domestic product divided by midyear population, Liquid liabilities (M2) is the sum of currency outside banks, demand deposits other than those of the central government, and the time, savings, and foreign currency deposits of resident sectors other than the central government as percentage of GDP. Domestic credit provided by the banking sector includes all credit to various sectors on a gross basis, with the exception of credit to the central government provided by the banking sector as percentage of GDP. Domestic credit to private sector refers to financial resources provided to the private sector, such as through loans, trade credits and other accounts receivable, that establish a claim for repayment as percentage of GDP. Inflation as measured by the consumer price index reflects the annual percentage change in the
cost to the average consumer of acquiring a basket of goods and services. Trade is the sum of exports and imports of goods and services measured as a share of gross domestic product. The choice of reliable proxies to characterize the amount of financial depth a country can provide, as well as the degree of estimating the efficiency of the financial sector, are key argument empirical work on this subject has deliberated upon. Different financial indicators covering different sections of the financial sector have been used to measure the services of the sector (see Ang and McKibbin 2005; Khan and Sehadji, 2003). The most used proxies are liquid liabilities/GDP (Levine 2003, Demetriades and Andrianova 2003), domestic credit to the private sector/GDP (Beck et al., 2000; Demetriades and Hussein, 1996; Levine et al., 2000; Levine and Zervos, 1993 and Ghirmay, 2004) and domestic credit provided by the banking sector/GDP (Acaravci, 2007 and Leitão, 2012). Guryay et al (2007) also employed ratio of deposits/GDP and ratio of loans to GDP to gauge the level of financial development in their analyses of the financial sector in Cyprus. In this study, ratio of broad money (M2) to GDP; ratio of domestic credit to GDP and ratio of private sector credits to GDP are used to measure financial development. King and Levine (1993b) asserted that “Users of financial depth hypothesize that the size of financial intermediaries is positively related to the provision of financial services”. Integrating different measures of financial deepening provide a more concrete view of the role played by the financial system. Economic growth is measured by the GDP per capita growth for each country. There are other factors which influence the growth of an economy. Excluding these variables could lead to bias in the estimation of the model. In order to address it, openness to trade and inflation variables are included in the regression to avoid simultaneous bias (Gujarati, 1995).
3.2 Model Specification

Stata statistical package is used to run the appropriate regressions. The association between economic growth and financial development is specified as below:\(^1\):

\[ Y_{it} = B_0 + \beta_1 FD_{it} + \beta_2 X_{it} + \alpha_{it} + \mu_{it} \quad (1) \]

Where \( i \) and \( t \) denote country and time respectively, \( Y \) is GDP per capita, \( FD \) is financial development, \( X \) is a vector of control variables, \( \beta \) measures the effect which financial development and the other factors have on economic growth, \( \alpha_{it} \) captures the country-specific effect which varies across individual countries and \( \mu_{it} \) is the error term.

3.3 Methodology

To investigate the causal relationship between economic growth and financial development, the order of integration in series and long-run association between the variables are examined using heterogeneous panel unit root tests and a heterogeneous co-integration test, respectively. Causality is test by using dynamic panel GMM estimator. Acaravci et al (2009) indicate that variation in economic conditions and the level of development in each country results in the heterogeneity in the Sub-Saharan African countries.

3.3.1 Panel Stationarity Test

To check whether the variables of concern are stationary or not, the heterogeneous panel unit root test Fisher Augmented Dickey-Fuller used by Choi (2001) and Levin-Lin-Chu test developed by Levin-Lin-Chu (2002) for dynamic heterogeneous panels are used. This test

\(^1\) King and Levine (1993b), Christopouloua and Tsionas (2004)
assumes that all panels share a common autoregressive parameter. The test selects the number of lags that minimizes one of several information criteria. The LLC test assumes that $\epsilon_{it}$ is independent and identically distributed across panels. The inclusion of a fixed-effect term in a dynamic mode as specified in (2) below leads to bias estimation Nickell (1981). The LLC approach yields a bias-adjusted t statistic that has an asymptotically normal distribution.

The stochastic process, $y_{it}$, is produced by the first-order autoregressive process below:

$$
\Delta y_{it} = \alpha_i + \beta_1 y_{it-1} + \epsilon_{it} \hspace{1cm} \text{ (2)}
$$

\[ H_0: \beta_1 = 0 \hspace{1cm} \text{ for all } i \]

\[ H_1: \beta_1 < 0, \hspace{0.5cm} i = 1,2,\ldots,N_L \]

The null hypothesis is that each individual series in the panel has unit root while the alternative hypothesis is that the series is stationary. We reject the null hypothesis of a unit-root if $\beta_1 = 0$ in (2) in favour of the alternative that the variable is stationary.

### 3.3.2 Panel co-integration analysis

Cointegration method is used to establish the long-run relationship between financial development and economic growth. This approach becomes more relevant if the variables are not integrated of the same order. An error-correction model by Westerlund (2007) is used in this study. This residual-based panel co-integration technique allows heterogeneity through slope coefficients, individual effects and individual linear trends across countries. Westerlund derived four statistics to test panel data co-integration which are $Gt$, $Ga$, $Pt$ and $Pa$. The first two statistics
are based on a weighted average of the individually estimated $\beta_i$'s and their t-ratio's, respectively. The last two tests are based on pooling of information over all the cross-sectional units. The tests allow for an almost completely heterogeneous specification of both the long- and short-run parts of the error-correction model as result of its flexibility (Westerlund, 2007). The model is specified as:

$$y_{it} = \alpha_i + \delta_{it} + \beta_i X_{it} + \varepsilon_{it} \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldot
It is assumed that first differences of instrumenting variables are not correlated with the fixed effects. The null hypothesis of Arellano and Bond test is that there is no autocorrelation and is applied to the differenced residuals. AR(2) detect autocorrelation in levels, therefore, the test for its significance in first differences is imperative. The Sargan test of over-identifying restrictions is used to test the validity of the instruments. The time-stationary vector autoregressive model is specified below.

\[
\text{GDP}_{it} = \delta_0 + \sum_{i=1}^{m} \delta_{1i} \text{GDP}_{it-1} + \sum_{i=1}^{m} \delta_{2i} \text{FD}_{it-1} + \eta_i + \varepsilon_t \quad \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots 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\ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots
\]
where \( \Delta \) is the first difference of the relevant variables. The null hypothesis that financial development does not cause economic growth is the joint test that \( \delta_{2t} = 0 \). If the null hypothesis is rejected, it means that financial development causes economic growth.
CHAPTER FOUR

4.0 Empirical Results

4.1 Panel Integration Result

Most time series contain unit root due to the stochastic time trend inherent in the data. As a result of this, a test for stationarity is carried out using Fisher Augmented Dickey-Fuller Test used by Choi (2001) and Levin-Lin-Chu test developed by Levin-Lin-Chu (2002) for dynamic heterogeneous panels. The results for the order of panel integration for the variables derived from the two heterogeneous panel unit root tests are reported in Table 1 below. Both the Augmented Dickey-Fuller test (ADF) and Levin-Lin-Chu panel unit root tests are significant from zero. The null hypotheses of both tests for all the variables are rejected at the levels. This suggests that the variables are stationary and integrated of order I(0). In regards to Levin-Lin-Chu test, all the variables were statistically significant at the 1% with the exception of domestic credit provided to the private sector and liquid liabilities which are significant at the 5% level.

Table 1: Panel Unit Root Results

<table>
<thead>
<tr>
<th>Variables</th>
<th>Levin-Lin-Chu</th>
<th>Fisher Augmented Dickey-Fuller</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Levels</td>
<td>Levels</td>
</tr>
<tr>
<td>GDPG</td>
<td>-14.2445***</td>
<td>-22.9126***</td>
</tr>
<tr>
<td>DBS</td>
<td>-2.3447***</td>
<td>-7.6302***</td>
</tr>
<tr>
<td>CPS</td>
<td>-1.7720**</td>
<td>-7.0593***</td>
</tr>
<tr>
<td>M2</td>
<td>-0.6545**</td>
<td>-6.0823***</td>
</tr>
<tr>
<td>INFLATION</td>
<td>-16.1423***</td>
<td>-20.5054***</td>
</tr>
<tr>
<td>TRADE</td>
<td>-4.2839***</td>
<td>-10.7846***</td>
</tr>
</tbody>
</table>

*** and ** indicate 1% and 5% significance levels respectively
4.2 Cointegration Result

One of the objectives of this study is to examine the long-run association between financial development and economic growth. The integration of the financial development indicators and economic growth proxy at the levels, thus, at the same order indicate that there exist a long-run relationship between financial development and economic growth. To confirm this, a test for cointegration is carried out using (Westerlund, 2007). All the four statistics tests derived by Westerlund suggest that the results are statistically significant 1% level as shown in Table 2. Therefore, the null hypothesis is rejected in favor of the alternative hypothesis which suggests the existence of cointegration between the variables. This serves as evidence that there exist long-run relationship between financial development and economic growth. The result does not support the findings of Acaravci, et al. (2009) who used panel data from 24 Sub-Saharan African countries from 1975 to 2005. Their results suggest that there are no long-run association between these two financial development and economic growth. The possible reasons for divergent results might be that first, their study cover only Sub-Saharan African countries while this study covers the whole of Africa. The difference might also be attributed to time period differentials. They used 31 years while the study period in this research work is 37 years. Their study covers 24 countries while 28 countries are used in this study.
Table 2: Panel Cointegration Results

<table>
<thead>
<tr>
<th>Co-integration between GDPG and DBS</th>
<th>Statistic Value</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gt</td>
<td>-3.853</td>
<td>0.000</td>
</tr>
<tr>
<td>Ga</td>
<td>-22.742</td>
<td>0.000</td>
</tr>
<tr>
<td>Pt</td>
<td>-21.560</td>
<td>0.000</td>
</tr>
<tr>
<td>Pa</td>
<td>-22.472</td>
<td>0.000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Co-integration between GDPG and CPS</th>
<th>Statistic Value</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gt</td>
<td>-3.899</td>
<td>0.000</td>
</tr>
<tr>
<td>Ga</td>
<td>-23.297</td>
<td>0.000</td>
</tr>
<tr>
<td>Pt</td>
<td>-20.867</td>
<td>0.000</td>
</tr>
<tr>
<td>Pa</td>
<td>-22.576</td>
<td>0.000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Co-integration between GDPG and M2</th>
<th>Statistic Value</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gt</td>
<td>-3.960</td>
<td>0.000</td>
</tr>
<tr>
<td>Ga</td>
<td>-23.544</td>
<td>0.000</td>
</tr>
<tr>
<td>Pt</td>
<td>-21.584</td>
<td>0.000</td>
</tr>
<tr>
<td>Pa</td>
<td>-23.331</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Number of series is 28 and Number of period is 37

4.3 Causality Result

To avoid the problem of over-identification, Holtz-Eakin et al (1988) suggest that the maximum lag length should be less than one-third of the total period of time. Cameron and Travedi (2010) demonstrate that when too many instruments are used the asymptotic theory gives a poor finite-sample approximation to the distribution of the estimator. The Sargan test is a specification test of over-identifying restrictions. It tests for the validity of the instrumental variables in the model.
The hypothesis for the Sargan test is that the instrumental variables are uncorrelated to some set of residuals, and hence they are valid instruments. The over-identifying restrictions are valid. The Arellano–Bond test is a test for the first and second order serial correlation in the first-differenced residuals under the null hypothesis of no serial correlation. Wald test statistic that follows a chi-squared distribution with degree of freedom of (k-m) is used. The joint significance of the overall regression model is tested by the Wald test under the null hypothesis of equal to zero. The result indicates that the variables are jointly statistically significant.

The maximum lag length is set at 10 years, which is less than one-third of the total time period of 37 years. The Sargan test is then applied to test for the validity of the instruments. The Sargan test refuses to reject the validity of the instruments used in all the equations. The result of this test is shown in Table 3. In the other end of the tests, The Arellano-Bond test did not reject the null hypothesis of no serial correlation. The results of all the models are statistically significant at the 99% confidence level.

Table 3: Panel GMM estimation for causality

<table>
<thead>
<tr>
<th>Variables</th>
<th>GDPG-DBS</th>
<th>DBS-GDPG</th>
<th>GDPG-CPS</th>
<th>CPS-GDPG</th>
<th>GDPG-M2</th>
<th>M2-GDPG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lags</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Wald Test (15)</td>
<td>390.37</td>
<td>33073.16</td>
<td>124.69</td>
<td>41397.91</td>
<td>240.11</td>
<td>14089.84</td>
</tr>
<tr>
<td></td>
<td>[0.0000]</td>
<td>[0.0000]</td>
<td>[0.0000]</td>
<td>[0.0000]</td>
<td>[0.0000]</td>
<td>[0.0000]</td>
</tr>
<tr>
<td>sign</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Arellano-Bond Test</td>
<td>-.05219</td>
<td>.72905</td>
<td>.71397</td>
<td>.54216</td>
<td>1.538</td>
<td>1.0596</td>
</tr>
<tr>
<td></td>
<td>[0.9584]</td>
<td>[0.4660]</td>
<td>[0.4752]</td>
<td>[0.5877]</td>
<td>[0.1240]</td>
<td>[0.2893]</td>
</tr>
<tr>
<td>Sargan Test</td>
<td>7.437685</td>
<td>2.13605</td>
<td>8.166845</td>
<td>15.63391</td>
<td>9.402063</td>
<td>12.57727</td>
</tr>
<tr>
<td></td>
<td>[1.0000]</td>
<td>[0.8797]</td>
<td>[1.0000]</td>
<td>[0.6815]</td>
<td>[1.0000]</td>
<td>[0.8595]</td>
</tr>
</tbody>
</table>

Note: The Wald tests are for the significance of the overall model. The degrees of freedom and p-values are in ( ) and [ ], respectively.
There are interesting results for the panel causality between financial development and economic growth. When financial development is proxy by domestic credit provided by the banking sector, the causality runs from financial development to economic growth. This implies that liberalization and efficiency in the financial sector to mobilize and allocate credit is an engine for towards economic growth. There are reverse causality between growth and other indicators of financial development. Improved liquid liabilities and domestic credit provided to the private sector stimulates steady growth in the broad activities in the economy in one hand while on the other hand, growth in the economy also leads to development in liquid liabilities and domestic credit provided to the private sector, indicators of financial development. This result conforms to (Baliamoune-Lutz, 2008 and Akinlo and Egbetunde, 2010). Baliamoune-Lutz (2008) finds bidirectional results for North African countries. Akinlo and Egbetunde (2010) using data from ten countries, found out that financial development causes economic growth in four countries while economic growth causes financial development in one of the countries and bidirectional in five countries.

The most comprehensive study in this field using long time series and covering many years in Africa is Acaravci et al (2009). Their study covers a period of thirty one years and a panel of 24 countries. Their empirical work to a large extent is the only work that is near this study in terms of time period and number of countries employed. Contrary to this study, their empirical result shows that economic growth causes domestic credit provided to the private sector, liquid liabilities leads economic growth and bidirectional causal relationship between growth and domestic credit provided by the banking sector. The likely explanations for the different results
might be that, first, their study cover only Sub-Saharan African countries while this study covers the whole of Africa. The difference might also be attributed to time period differentials. They used 31 years while the study period in this research work is 37 years. Their study covers 24 countries while 28 countries are used in this study.
CHAPTER FIVE

5.0 Conclusions and recommendation

This paper examines the long-run relationships and causality between financial development and economic growth in Africa. The study covers a period of 37 years from 1975-2011 from 28 countries. Liquid liabilities, domestic credit to the private sector and domestic credit provided by the banking sector are used as indicators of financial development whereas GDP per capita growth as a proxy of economic growth. The econometrics techniques used are Fisher Augmented Dickey-Fuller and Levin-Lin-Chu tests for dynamic heterogeneous panels and GMM approach for dynamic panel data developed by Arellano-Bond (1991). All the variables of concern are integrated of order I(0). This suggests that the economic growth and financial development indicators are cointegrated and there exist long-run relationship between them. The four statistic tests developed Westerlund (2007) support the evidence of the existence of long-term association between financial development and economic growth.

The results of the GMM dynamic panel analysis substantiate that financial development proxy by domestic credit provided by the banking sector causes real growth in the economies of Africa. There are bidirectional causality between financial development and growth when financial development is measured by domestic credit provided to the private sector and liquid liabilities. It is evident through this study that past economic performance has positive impact on the current real growth of the economy. Therefore, any policies and reforms to broaden the prevailing economic processes will engender future economic activities. Since agriculture is the basic economic activity and employs more labor force in almost all the Africa countries, it will be imperative to develop this sector. This could be done by way of using modern methods of
production, training of farmers to apply cost effective way of production, establish market for agriculture produce and value addition to produce. This to a large extent will create more jobs, increase household income and boost productivity. Reverse causality suggests that economic growth stimulates financial development. Hence, efforts aimed to grow the economy will also facilitate financial development, which will feed back to the growth process.

When financial development is proxy by domestic credit provided by the banking sector, the causality runs from financial development to economic growth. There is reverse causality between growth and other indicators of financial development. Development in liquid liabilities and domestic credit provided to the private sector stimulates steady growth in the broad activities in the economy. While on the other hand growth in the economy also leads to development of liquid liabilities and domestic credit provided to the private sector, indicators of financial development.

This study provides evidence that financial development leads to growth. Therefore in order for Africa Countries to benefit from growth the steady state of the economy, it is suggested that the various countries should initiate policies and regulations to reform further their financial systems. This could be done by way of technological innovations and enhancing efficiency to ensure prudential regulation and management, disclosure of information to reduce the problems of adverse selection and moral hazard, credit expansion, expansion of the capital market to be more liquid and raise long-term funds for corporate bodies and accessing of credit by large number of the populace. It is further recommended that development of microfinance institutions should be taken very assiduously in the region. Development of microfinance institutions will
ensure credit accessibility to the rural folks to initiate viable startup businesses and existing ones to increase their income level and reduce poverty.

It is commonly argued that due to underdevelopment and non-complexity of the financial systems in Africa, the global financial crisis has little or no effects on its economies. To ascertain the truth, this study could be extended by examining how the late 2000s global financial crises impacted on the growth process in Africa. Studies in India and Bangladesh have shown that development in microcredit helps to alleviate poverty level (Khandker, 1998 and Burgess & Pande, 2003). But problem with data availability in regards to poverty indicators at the aggregate level is more profound in Africa. It would therefore be interesting for future research to examine how financial development reduces poverty using panel data in Africa.
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